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Bridging the gap between user experience research and design in industry
An analysis of two common communication tools: personas and scenarios

Cynthia Putnam

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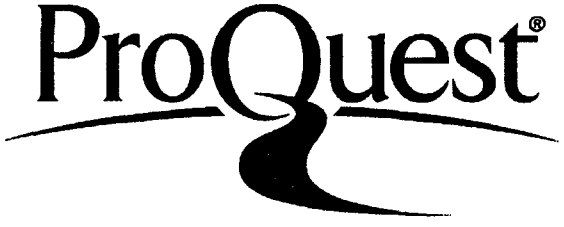
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Abstract

Bridging the gap between user experience research and design in industry
An analysis of two common communication tools: personas and scenarios

Cynthia Putnam

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User experience (UX) research in the design of technology products utilizes human-centered design (HCD) methods to summarize and explain pertinent information about end users to designers. However, UX researchers cannot effectively communicate the needs and goals of users if designers do not find UX research (a) easy to integrate into design processes and (b) perceive it as contributing valuable information that helps them create better designs. Personas and scenarios are examples of HCD summarizations/communication tools employed by UX research.

Personas are archetypal characters that represent a group of users who share common goals, attitudes and behaviors when interacting with a product or service. A scenario is a story describing a character using a product/service. In this investigation, scenarios were not explored as artifacts apart from personas; instead, the scenarios that were employed described personas interacting with a product/service.

Specifically, this investigation asked are personas (with scenarios) perceived as usable, useful and effective summarizations of UX research by designers; in other words, do they meet the positive claims made of them in the literature and avoid criticisms and concerns? In addition, what should UX researchers strive to understand about designers to maximize understanding of end users; in other words, can personas (with scenarios) be made more useful/usable?

This was studied, in part, by using personas (with scenarios) that represented mobile users in Kyrgyzstan. This user population represented an example of an audience with whom local designers (from Seattle, Washington) would have minimal familiarity. As technology expands to new audiences, the chances to encounter unfamiliar users will increase; this lack of familiarity amplifies the importance of useful/usable UX research.

Key findings included: (a) personas (with scenarios) were effective in helping designers focus on specific users and facilitating communication regarding the users; (b) personas were less successful at helping designers empathize or avoid ill-informed assumptions about users; and (c) several designer attributes appeared to be associated with persona effectiveness, including professional experience level. Disambiguating variables that contribute to the utility of personas (with scenarios) will help better the communication between UX research and design in industry, ultimately leading to better end user experiences.

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Introduction

User experience (UX) research for the design of technology products and services utilizes several methods from human-centered design (HCD)[1] to summarize and explain pertinent information about end users to designers.[2] The UX researcher in this role acts as a bridge, communicating the goals and needs of end users to designers; the goal of the bridge is to help designers make more useful and usable products for end users by helping designers keep the user in mind throughout the design process.[3] However, UX researchers cannot effectively communicate the needs and goals of end users if designers do not find UX research (a) easy to integrate into design processes and (b) perceive it as contributing valuable information that helps them create better designs. This dissertation explored multiple variables that have the potential to affect the perceived usefulness and usability of UX research by designers when it is summarized by two common HCD communication artifacts (i.e. personas and scenarios).

Personas and scenarios are examples of communication artifacts employed by UX research. A persona is an archetypal character which represents a group of users who share common goals, attitudes and behaviors when interacting with a particular product or service (A. Cooper, Reimann, & Cronin, 2007; Mulder & Yaar, 2007; Pruitt & Adlin, 2006). A scenario is a story describing a character in an activity (Carroll, 2000b; Go & Carroll, 2004; Rosson & Carroll, 2003). This investigation only explored scenarios as augmentations to personas, not as artifacts separate from personas. As such, the scenarios investigated in this dissertation described

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[1] I use the term HCD interchangeably with user-centered design (UCD) in this dissertation.

[2] When I use the term "designer" I am including all those responsible for *interaction design* as defined by Cooper, Reimann & Cronin (2007) as "the practice of designing interactive digital products, environments, systems and services". Actual job titles could include graphic designers, developers, interaction designers, information architects, technical writers, interface designers, product designers etc.

[3] The UX researcher and designer can be the same person or group of people. Roles are separated in this dissertation to emphasize the differences in the responsibilities and tasks of each role in the HCD process rather than focusing on actual job titles. Additionally, I found that designers and UX researchers do not typically perform dual roles in industry. The primary audience for UX research are designers .This also confirms findings by others (Pruitt & Adlin, 2006) .

personas (as the characters) in activities in relation to a product/service. Personas (with scenarios) are intended to summarize user data and help designers understand that they are not the user. However, in the short history of computer technology design (computers, mobile phones, etc.), designers and end users have often shared considerable overlap in their lived experiences (Donner, et al., 2008); therefore, personas and scenarios have often described users who were very much like themselves and consequently there was an innate understanding of end users.

Specifically, the role of a designer (for example, office worker creating computer interfaces) and the role of an end user (for example, office worker producing something on the computer) has had considerable overlap – an overlap that has had the potential to give designers a (perhaps false) sense of already having a good idea about what a user needs in a product or service. In fact, HCD in this perspective is achievable with minimum UX research because designers have an innate understanding of end users. As end user populations for computer technologies diversify globally, move out of the office, and toward greater inclusion, the possibilities for a disparity between designer roles and user roles will naturally increase; therefore, identifying the variables that make UX research perceived as useful, usable and effective for designers will be increasingly important. The expansion of end user populations who will utilize technology products will also require UX researchers to examine their current methods for investigating end user populations. For example, how will UX researchers need to adapt or modify existing methods when considering populations in different cultures or people with disabilities? Research questions for this dissertation had two dimensions:

- In the UX Researcher – Designer relationship which is concerned with variables that affect UX research utility for designers. The mediator between UX researchers and designers is the translation or interpretation of the end user derived from the research itself; for example, written reports, persona or scenarios, see Figure 1.
- In the UX Researcher – End User relationship which is concerned with methods researchers employ to investigate populations in the creation of UX research. The mediators between UX researchers and end users are research methods; for example,

usability studies, contextual inquiries, interviews and design ethnographies, see Figure 1. Additionally, the research content is directed through the lens of the proposed product features (or product changes in the cases of an existing product).

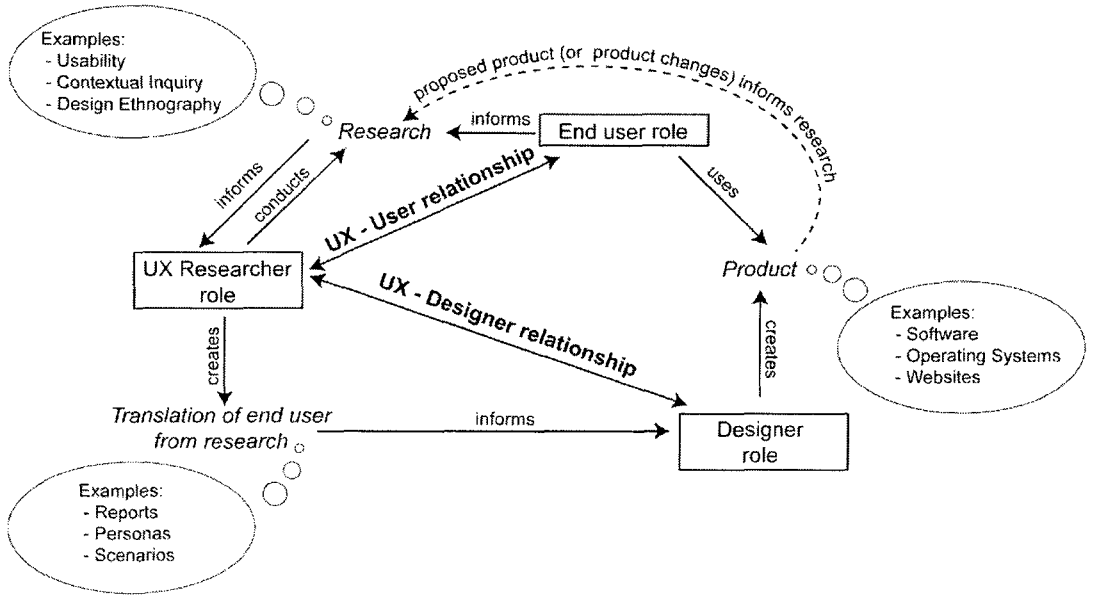


Figure 1: Communication Triad[4]

In the first dimension, UX Researcher – Designer relationship, two primary research questions of this dissertation are explored: (1) Are personas (with scenarios) perceived as usable, useful and effective translations/conduits of user research by designers; in other words, do they meet the positive claims made of them in the literature and avoid the criticisms and concerns? (2) What should UX researchers strive to understand about designers to maximize designer understanding of end user goals and needs; in other words, can personas (with scenarios) be made more useful and usable? This was studied in part by using personas and scenarios describing mobile phone users in Kyrgyzstan, who represent a single case of a geographical and

[4] Note that the emphasis in the figure is on roles, not a specific job title. It is (obviously) possible for a designer to play the role of a UX researcher, and vice versa, or for a single person or group to play both roles. However, this research found that most working designers and UX researchers did not perform dual roles.

culturally 'distant audience'. None of the study participants who interacted with the Kyrgyz personas and scenarios had an existing innate familiarity of the end user population.

In the second dimension, the UX Researcher – End User relationship, I explored a secondary research question which considered how UX researchers may need to contemplate method modifications for researching distant audiences. Specifically, in the secondary research question I asked, how might UX researchers create personas and scenarios when they have limited access to end users? Using a case study of mobile users in Kyrgyzstan, I reported on the differences between (a) the procedures for gathering information and creating personas and scenarios as presented in the literature, and (b) how I modified the procedures for an audience (mobile phone users in Kyrgyzstan) in which I had limited access.

The dissertation investigation began with the deployment of an online screening survey. The screening survey provided a pool of participants in which many attributes were known, including age, job title, professional experience, familiarity with UX research and level of understanding of HCD principles. I then recruited some screening survey respondents for an exploratory design study in which participants were given the Kyrgyzstan personas/scenarios. The participants were observed as they used the UX research documents. Other screening survey respondents that reported experience with personas were sent a follow-up survey which asked about their past experiences using personas.

Personas (with scenarios) were found to be effective in helping designers focus on specific users and facilitating communication about those users; however, they were less successful at helping designers empathize or avoid ill-informed assumptions about users. Additionally, designer attributes which included professional experience level appeared to be associated with persona effectiveness. Disambiguating variables that contribute to the utility of personas (with scenarios) will help better the communication between UX research and design in industry, ultimately leading to better end user experiences.

The remainder of this dissertation is organized as follows:

- Chapter 1 presents the theoretical frameworks guiding this investigation
- Chapter 2 presents background information about personas and scenarios

- Chapter 3 introduces the method outline for this investigation
- Chapter 4 describes the methods and findings from a screening survey that provided a pool of participants for a follow-up survey and a design study in which designers were asked to use personas and scenarios
- Chapter 5 details the methods used for the design study and the follow-up surveys
- Chapter 6 reports on designer variables that provided a lens to analyze later findings
- Chapter 7 describes findings from the design study in which designers were observed using personas and scenarios which represented mobile users in Kyrgyzstan
- Chapter 8 explores findings about past personas experiences from both the follow-up survey recipients and design study participants
- Chapter 9 presents findings that describe what is salient to designers relative to persona/scenario use
- Chapter 10 describes findings about how the beneficial claims and criticisms of personas (with scenarios) were discussed by survey responders and design study participants
- And finally, Chapter 11 summarizes all findings relative to the research questions and outlines possible future work.

Chapter 1: Theoretical frameworks

Theoretical frameworks guiding this investigation are from two different disciplines, i.e. rhetoric and design cognition research. The foundational theoretical framework is from rhetoric which emphasizes the roles involved in communication. Research involving design cognition provides further guidance in understanding how designers think about design problems. Each of these disciplines will be discussed in the following sections, with an emphasis on how each discipline guides this dissertation research.

1.1: Rhetorical theory

It is impossible to completely understand the perspective, knowledge and emotions of another. Furthermore, role theory in social psychology suggests that humans behave through a series of roles that are socially defined and accepted by individuals based on multiple variables including one's need to conform and group expectations (Passer & Smith, 2004). This suggests we only witness the roles people assume in communication and that a coherent whole 'other' is impossible to conceive. Yet, the HCD philosophy of human-computer interaction (HCI) proposes that another, the 'user', be at the center of technical system design (Johnson, 1998). If we accept that people communicate through roles they assume appropriate to their rhetorical purposes (Coney, 1992), then the best approximation of the user we can possibly know is through the roles users play in relationship to a system. What does it mean then for creators of technical systems to understand users (or more accurately user roles), and how can users be effectively communicated and discussed? Rhetorical theory provides a lens through which these questions can be analyzed.

To understand the relevance of rhetorical theory as a theoretical framework for this research, I describe how the assumptions underlying rhetoric in technical communication evolved from being purely functional to rhetorical in the next sections. I first discuss the perception of the early role of technical communicators and how the constructivist view of language and science changed the role of technical communicators from transmitters of information to translators of content (section 1.1.1). I then discuss how this transition

necessitated the introduction of audience analysis (understanding users) and the acknowledgment of rhetoric nature of technical communication (section 1.1.2). Finally, I discuss how rhetorical theory can provide a lens for understanding the roles of UX researchers and design teams in the creation of user experiences in technology (section 1.1.3).

1.1.1: Transmission view: early technical communication

Prior to World War II, technical communication (TC) was viewed as a means to transmit scientific facts; this situated TC as functional and instrumental (Slack, Miller, & Doak, 2006). This perspective assumed that (1) the receiver had exactly the same view as the sender, and (2) the message was a perfect image of the original information. The role of technical communication was to provide a 'windowpane' on reality and good science writing was a "series of maneuvers to stay out of the way" (Miller, 1979). Subsequently, the focus of technical writing was on style, form, the use of objective tone and passive voice. The power to create knowledge rested in the hands of the engineer or scientist, the technical communicator acted as a meaningless clear channel, and the receiver/user was a passive receptacle. This perspective changed in response to a widening recognition that knowledge is socially constructed and rhetorically negotiated (Dombrowski, 2002).

Post World War II, many in science fields recognized that knowledge is inherently embedded in history and society; knowledge is relative rather than absolute (Patton, 2002). Kuhn illustrated this notion through his concept of a 'paradigm'(Kuhn, 1996). The concept of a paradigm postulated that science was conducted and enforced through group consensus; paradigms create constraints that help further science by allowing practitioners to focus on necessary details (Bazerman, 1993). In this view, 'truth' is a matter of consensus among informed constructors but does not correspond to an objective reality. Knowledge is a web of beliefs and science is a "socially sanctioned system of rhetorically reasoned and empirically verified beliefs" (Dombrowski, 2002). This move from positivistic view of science to a rhetorical view of science fundamentally changed the role of a technical communicator from a transmitter of a message to a translator who interprets and communicates meaning.

1.1.2: Translation view: introducing audience analysis and rhetoric

The translation view is concerned with the interpretation and reinterpretation of meaning as it is constructed by both the sender and the receiver (Slack, et al., 2006). Receivers in this perspective are no longer passive receptacles but active members of the communication exchange. The sequence of the communication is viewed as follows: the sender encodes the message from within the infrastructure in which she operates and based on her knowledge creating meaning 'one' and then sends this interpretation to the receiver; the receiver decodes the message based on his own framework and knowledge creating meaning 'two'. There is never perfect symmetry between the two meanings, but the first meaning is dominant (Slack, et al., 2006). In this communication framework, the sender is tasked with trying to 'fix' a meaning to text or some other form of communication medium where meaning is socially negotiated and dynamic. The technical communicator, therefore, is tasked with understanding (a) the receiver and (b) the language by which the receiver can best understand the message. Therefore, the rejection of the transmission view of technical communication and an acceptance of a rhetorical translation view necessitated the need for audience analysis (Slack, et al., 2006).

One hallmark of a translation view of technical communication is audience analysis (Coney & Steehouder, 2000). Ede and Lunsford suggest writers envision their audience as either (1) a real "addressed" audience whose characteristics and goals are measurable or as a (2) fictionalized "invoked" audience whose characteristics and goals are imagined (Ede & Lunsford, 1984). Rhetorical theory asserts that whether the writer is asked to analyze or imagine the audience, the audience always becomes a construct in the writer's mind while the writer is engaged in creating the text (M. Cooper, 1986). Gibson (1950) differentiated the addressed and the invoked audience as 'real' and 'mock' readers. Gibson argued that it was not necessary that a writer 'correctly' imagined/constructed a reader; instead, it was critical that the readers actively engaged with the writing. The reader, therefore, has the option to accept the rhetorical role implied by the writer. Gibson argued that a reader would accept the role if the writer had an understanding of what would persuade the reader to accept the 'mock reader' role. In this way, both writer and reader are negotiating the roles between them; the effectiveness of a

communication then, relies on the writer supplying the proper cues to the reader so that she may become the mock reader as envisioned by the writer (Coney & Steehouder, 2000; Gibson, 1950; Ong, 1975). This perspective emphasizes the importance of rhetorical roles in communication.

In summation, rhetoric and role theory in social psychology assumes that humans communicate through a series of roles; roles that are assumed for rhetorical purposes (Coney & Steehouder, 2000). The acceptance of role theory negates the possibility of a writer to conceive of a reader as a coherent whole introducing a need for audience analysis. The parallel logic implies that neither UX researchers nor designers can know end users as coherent wholes, but only in the role(s) they will play in relation to a particular product or service.

1.1.3: Rhetorical theory and UX research

Conducting UX research is equivalent to analyzing the end user audience as 'addressed'. Communication tools (i.e. personas and scenarios) used to summarize research about end users are equivalent to the end user audience 'invoked'. In order to construct persona and scenarios, proponents emphasize the need to use data from real users. With this emphasis, it can be argued that UX research for persona and scenario creation strives to align the image of invoked users as closely as possible to the goals and needs of the addressed (real) users. The importance of aligning the addressed audience to create an image of the invoked audience has also been a focus in research on writing.

Flower and Hayes compared good writers to poor writers and reported that the primary difference between the two groups was the depth of the level they developed their image of the reader and the reader's situation (Flower & Hayes, 1980). If a well developed image of a reader helps a writer produce better material, then it can be assumed that a well developed user image would help designers create better user experiences. Therefore, it is not just important to analyze the addressed end user audience in UX research, but equally important that UX researchers know how to effectively communicate an end user image to designers.

There are three areas where rhetorical theory provides a supporting and illuminating framework for this dissertation research. First, rhetorical theory offers a perspective on the relationships between UX researchers, designers and end users that emphasizes the roles each

play in UX research. This perspective focuses on the user as a message; in other words, this perspective focuses on the user as a negotiated construct between UX researcher and designers. In this perspective, it can be assumed that UX researchers have a 'mock designer' construct image; however, this construct may not be well developed.

Second, there is an analogous relationship between the mock user and the mock reader. Research on writing has established that a clear, focused, reader construct, even if it is not completely aligned to real readers, will help an author create a *consistent* piece of communication with clear cues and guideposts. Clear cues and guideposts help the real reader to understand his role as the mock reader. The mock reader concept has an analogy in software design: if designers have clear, focused, user construct in mind as they create interfaces, even if this construct is not completely aligned to real users, it will help designers create interfaces that help real users adopt the role of the mock user.

Third, for designers to accept the UX researcher as an expert on end-users, they must also accept the role of the mock designer. This emphasis on the requirement for the designers to accept the role of mock designer accentuates the need for the content of the research to be *persuasive* in order to be useful, usable and effective. Each of these three areas is discussed in greater detail in the following sections.

1.1.3.1: Perspective on the rhetorical relationships in UX

The role of the UX researcher as a communicator situated between the designer and the user is analogous to the historical relationship of the technical communicator as situated between the engineer/scientist and the reader. The rejection of the clear channel concept of communication suggests that the UX researcher cannot be considered a clear channel bringing the user message to the design team. The user is, instead, a negotiated concept between UX researchers and designers.

Even if, we assume for the moment, the researcher has ascertained a perfect snapshot of the user in a role, (relative to a particular product), and that this user message is encoded flawlessly in a communication artifact like a persona, designers still need to decode the message based on their knowledge and experience. Redefining UX research as part of a negotiated user-

concept emphasizes that regardless of the accuracy or skill by which a persona or scenario is created, if the designer does not have the proclivity, interest, or experience to engage in the research, the user message will be lost in translation. In other words, the designer will not have accepted the role of mock designer.

Since designers are the end users of UX research, those who communicate the research should strive to understand the designer's knowledge and abilities to maximize the end user message. In other words, not all designers have an equal ability to understand and utilize research about users in their work, but knowing what will help designers towards this understanding is part of the UX researcher's job. Why do research at all if it cannot be used? While clarifying that designers are the end users of UX research, rhetorical theory also emphasizes the rhetorical roles in the conveyance and utilization of UX research.

In the UX Researcher-Designer relationship, the UX researcher's rhetorical role is that of 'user-expert'. The designer is the audience for the 'user as message', which can be in the form of personas and scenarios; the designer's rhetorical role is that of the mock designer, see Table 1. Conversely, in the Designer-User relationship, the designer who utilizes the research plays the rhetorical role of an expert at understanding the functionality of the technology they are trying to communicate in a user interface. The audience for the user interface is the end user whose rhetorical role is the mock user, see Table 1. Reframing the user as a negotiated concept illustrates a complicated communication between the UX researcher and the designer often overlooked in the discussion of HCD.

Table 1: Rhetorical roles in UX communication

Role	Rhetorical Role	Audience	Rhetorical Role of the audience	Message	Medium (Communication Tool(s)
UX researcher	User expert	designers	mock designer	End User	Research summarizations which include personas and scenarios
Designer	Expert in the functionality of the technology	end user	mock user	Functionality of the technology	User Interface; manuals, help systems, etc.

1.1.3.2: Analogous relationship between the mock user and the mock reader

Personas as the mediums of the user message are analogous to the mock reader concept in rhetorical theory. Following Gibson's (1950) reasoning, the benefit of using personas and scenarios as research summarizations is to create a construct of the user (mock user) in a designer's mind. A mock user, therefore, narrows the focus from all users to a specific user(s) and thereby helps designers create *consistent* user experiences for user(s).

If UX researchers create usable, useful and effective images of mock user(s) for designers, the designer is in turn asked to create an experience through a user interface that guides an end user through the technology. If the guidance provided by the user interface is clear and consistent, then the user will be encouraged to adopt the role of the mock user. Just as in writing, whether the end user accepts the rhetorical mock user role depends on the clarity of the cues in the interface, not necessarily the level of alignment between the real user and the mock user. Rhetorical theory helps us understand that at least part of the utility of personas and scenarios is to provide a *clear focus* of end users that in turn, help designers keep the user in mind in order to create a *consistent* end user experience.

1.1.3.3: UX research needs to be usable and persuasive to be effective

The rhetorical role of the UX researcher as 'user-expert' has to be accepted by the design team for the negotiated user-concept to be communicated effectively. Therefore, the usability and perceived usefulness of personas/scenarios (or any research summarizations) will directly affect a persona/scenario's capacity to not only convey the mock user, but to *persuade* the designer to adopt the mock designer role. As such, persona and scenario value can be affected by both presentation and designer perception of the methods that were employed in the persona and scenario creation.

The manner in which the UX research is presented to the design team may affect whether the team will be persuaded to consider UX research. For example, there have been many attempts to engage designers through various mediums of persona presentations including posters, laminated information sheets, and more experimental modes such as action figures (Nieters, Ivaturi, & Ahmed, 2007). However, if the primary goal of personas and scenarios is to

create a mock user(s) construct in the mind of designers, then the medium is important only in so far as it helps to facilitate this primary goal. In other words, according to rhetorical theory, UX researchers should ask if alternative presentations help designers keep the user in mind. Consequently, part of audience analysis for constructing a mock designer includes an understanding of what matters to designers in regards to presentation when receiving communication about users.

Clarifying that the primary goal of UX research is to create a useful, usable and actionable mock user(s) for designers will also shape the debate about methods used to create personas. Some have argued for more quantitative methods and larger sample sizes to remove some of "the subjectivity inherent in persona creation" (Chapman, Love, & Alford, 2008; Chapman & Milham, 2006). While this debate has the potential to undermine the persuasive quality of UX research, if using more quantitative methods and larger samples will increase persona's persuasive qualities for designers, then this is a valid argument.

This is not to say that it is unimportant for UX researchers to strive to align mock users to the real users as much as possible; however, rhetorical theory cautions that alignment to real users is not the singular value of a mock user construct. As argued above, the mock user as a negotiated user concept is meant to create a clear focused construct. Therefore, if methods employed by UX researchers are important to designers (the audience) then UX researchers should strive to know what methods will lead to more persuasive UX research.

In summation, rhetorical theory guided this dissertation in considerations that will help UX researchers communicate better to designers. By emphasizing the rhetorical nature of communication, rhetorical theory stresses the need for UX researchers to conduct audience analysis of designers to help define the mock designer(s) to whom they aim their research message. Rhetorical theory also emphasizes that at least part of the utility of personas and scenarios lays in its ability to create a clear user construct, not necessarily one that is completely aligned to real users. Finally, personas and scenarios need to be persuasive to designers in order to be effective summarizations of UX research.

1.2: Design cognition research

In the UX communication triad – researcher, designer, and user – the designer holds a unique position. A user's experience is largely influenced by factors that are in the realm of designer control – experiences that can include error-free functionality, the user interface (UI), and help systems. As discussed above, rhetorical theory suggests that UX researchers need to understand how designers think to appreciate how best to transmit the end user message. Researchers in the field of design cognition are attempting to understand how designers think, acquire and use their knowledge.

In next sections, I highlight design cognition literature that has pertinence in evaluating the usability and usefulness of UX research for designers. First, I present background information and common methods used in design cognition studies that later guide methods that are utilized in this dissertation research (section 1.2.1). Second, I discuss how the design cognition literature differentiates between science and design (section 1.2.2); this discussion is a fundamental thread underlying much of the literature in design cognition. Next, I detail relevant studies and findings that directly informed this investigation (section 1.2.3). Finally, I present how theories derived from these relevant design cognition studies helped to guide this dissertation research (section 1.2.4).

1.2.1: Background and methods

As seen in the origins of rhetorical theory, research in design cognition began with a positivistic framing. The origins of design cognition research began with an attempt to reframe design as a science versus an art. Much of the literature places this origin point in the 1920s when several groups of designers and artists expressed an explicit goal of making design a rational science. Ralf Michel (2007) argues this was a response to the increasing complexity of design in the industrialized modern era. As designers moved from crafts-persons to professionals, (i.e. from builders to planners), Michel argues, designers could no longer solve problems without conducting parallel research in related fields; related areas that included materials science, engineering science, and behavioral science (Michel, 2007). In this time

period, Theo Van Doesburg, best known as the founder of De Stijl[5], exemplified the idea of design as science when he wrote that "... in order to construct a new object, we need a method, that is to say, an objective system" (Cross, 2007b). The same time period witnessed a desire to rationalize design through the Bauhaus movement and in the works of the architect Le Corbusier.

This new framework of 'design as science' reemerged with new emphasis later in the 1960s with the 'Conference on Design Methods' held in London in 1962. Many feel this conference marked the launch of design cognition as a field of academic inquiry (Cross, 2006). The 1960s was an optimistic time for applying scientific thinking to design, typified by Buckminster Fuller's proclamation of the years between 1965- 1975 as the 'World Design Science Decade'. Fuller's declaration was made at the meeting of the International Union of Architects in Paris which he felt was committed to "applying the principles of science to solving the problems of humanity" ("Buckminster Fuller," 2009). Other 'design as science' protagonists in this time period included Christopher Alexander who originated a scientific method for architecture and planning, which he detailed in his book entitled 'Notes on the Synthesis of Form' published in 1964 (Alexander, 1964), and Herbert Simon who called for the development of a 'science of design' in universities in an attempt to legitimize design as an academic discipline in his first edition publication in 1969 of "The Sciences of the Artificial" (Simon, 1969).

However, the movement to rationalize design experienced a backlash in the 1970s which Cross (2007b) argues was partially due to the lack of success in integrating the scientific approaches into everyday design practice. Even some earlier enthusiasts turned away from a rational approach to design. For example, Alexander expressed disappointment in the movement in an interview recorded in the Design Methods Group (DMG) Newsletter (this newsletter supported the rational approach to design) when he stated "...I've disassociated myself from the field... I resigned from the Board of Editors of the DMG Newsletter because I felt that the purposes which the magazine represents are not really valuable and I don't want to be identified

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[5] De Stijl was a Dutch art movement probably most famous for the inclusion of painter Piet Mondrian. The group believed they could find an inclusive fundamental principle of design that would apply to all design fields including furniture and town planning (Hamilton, 1970).

with them. ...there is so little in what is called 'design methods' that has anything useful to say about how to design buildings that I never even read the literature anymore" (Alexander, 1971). Out of the backlash came renewed directions as other supporters argued that earlier incarnations of design research were simply clumsy first generation concepts. This opened the door for a new group of enthusiasts who reframed design research/design science through the late 1970s and 80s (Cross, 2006).

In the 1980s the research literature shifted away from an attempt to impose a scientific model on design towards an understanding that design is distinct from science requiring it to be studied on its own terms. Donald Schön proposed a constructivist paradigm and challenged the positivist doctrine underlying much of the earlier design science movement and called for a search of "an epistemology of practice implicit in the artistic, intuitive processes which some practitioners do bring to situations of uncertainty, instability, uniqueness, and value conflict" which he called 'reflective practice' (Schön, 1983). In about the same time period (1979), Cross coined the phrase "designerly ways of knowing" which captured the concept of design as an epistemology while concurrently acknowledging that design is an essential aspect of human intelligence not unique to designers (Cross, 2007a).

In tandem with the shift of focus in design research, many influential publications originated in this time period. Important journals include 'Design Studies' which began publication in 1979 and 'Design Issues' which was first published in 1984. Among the prominent books published in the 1980s was Bryan Lawson's first edition of "How Designers Think: The design process demystified" (Lawson, 2006). Lawson's book is based on his extensive teaching career and observations of working designers in the field of architecture. Like Cross, and many other researchers in this domain, Lawson's interests in design cognition research are largely motivated by a desire to lay a foundation for design as an academic discipline thereby increasing the effectiveness of design instruction.

The fundamental reasons behind the transition from a positivistic framing of 'design as science' to 'design as its own discipline' came from four key insights: (1) the goal of design is different than the goal of science; (2) whereas science seeks repeatability in its findings design

desires originality in its outcomes; (3) design problems are different from science/math problems; and (4) consequently, the tactics (process) applied for solving a design problem are unlike the strategies used by scientists. In the next section (1.2.1.1), I discuss these insights and their effects on design cognition research. However, it is important to note that these depictions of design versus science use extreme portrayals of both design and science to make their case.

I do not believe that design and science are at extremes, but instead on a continuum. On one end of the continuum is hard science representing unchangeable and absolute knowledge (epistemology of the realist) and on the other side is design representing a malleable and changeable reality (epistemology of the constructivist). In truth, many scientists, especially in social science, view reality from a relativistic constructivist frame and most designers confront unchangeable and knowable constraints. Other authors have also noted that science and design share much common ground.

Pieter Jan Stappers (2007) wrote that "...both research and design are endeavors that improve the understanding of or control over the human condition." Additionally, he notes that both employ an iterative cyclic approach from ideation to solution (hypothesis) testing. Moreover, there are many in the design field who advocate a shift in design pedagogy to include research methods that will blur the distinction between designer and scientist even more (Laurel, 2003; Stappers, 2007). However, for the sake of understanding how science and design diverge, the use of extremes is helpful in illustrating their differences; therefore, the discussion below contrasts an 'extreme science' view with an 'extreme design' view.

1.2.1.1: Design is not a science

I discuss each of the four key insights that facilitated the shift from 'design as science' to 'design as its own discipline' in the next sections (1.2.1.1a-d).

1.2.1.1a: The goals of science and design are different. In the most basic sense, the goal of a designer is to create a thing while the goal of a scientist is to observe, understand and explain a thing. This was eloquently stated by Christopher Alexander: "Scientists try to identify the components of existing structures, designers try to shape the components of new structures" (Alexander, 1971). Krippendorf (2007) argues that data are at the center of science and creation

is at the center of design. He writes that (a) science starts with data; (b) the scientist conducts research using the data; and (c) research is the process of searching for patterns that are manifest in the data (Krippendorff, 2007). In comparison, he claims that design is "making sense of things (to others)" where the creation of artifacts for future use by others is the center of design activity (Krippendorff, 2006). Related to differing goals and focus, scientists desire repeatable results while designers strive for new innovations.

1.2.1.1b: Science seeks repeatability in findings. Science asks researchers to carefully record their methods so that other scientists may follow those methods (sequentially) to find the same or similar results. This is the very essence of reliability. Conversely, designers do not desire to repeat the outcomes of those who come before them.[6] Attempts to apply sequential route maps of the design process (there are many) by their very nature require an assumption of a sequence of identifiable activities. Route maps seem an especially intuitively useful method for scaffolding novice designers in their early efforts; however, preliminary empirical research does not necessarily support their effectiveness (Newstetter, Eastman, & McCracken, 2001). Atman and Turns report that while they have seen consistency in the types of activities involved in the design process, the sequence and duration of those activities varies widely (Atman & Turns, 2001). Sequential route maps, therefore, provide helpful conceptual frameworks of the design process, but in actual design practice, it is design activities that share consistent overlap, not the sequence of the activities.

1.2.1.1c: The problems of science and design are different. An emphasis on design problems has focused much of the design cognition research on differences between design problems and science/math problems. In this contrast, science/math problems are considered like puzzles that have one 'correct' solution compared to design problems which have many possible solutions. In this depiction, design problems are considered 'ill-defined' or 'wicked' problems (Rittel & Webber, 1973; Thomas & Carroll, 1979). Other features of wicked problems include constraints and criteria that are undefined. Several researchers have found that even when given

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[6] This statement is not as true when considering developers as part of the 'designer' definition. In the science-design continuum, developers are more like scientists in their desire for repeatable results.

a well-defined problem, designers approach the solution as if it was ill-defined, for example, by changing the goals and constraints (Cross, 2001). According to the literature, wicked problems require the adoption of cognitive strategies that are unlike those found in science (Cross, 2007a).

1.1.2.1d: The strategies used by science and design are different. A well-defined problem can be solved with inductive or deductive logic whereas ill-defined problems need to be solved using abductive reasoning (March, 1976).[7] Abductive reasoning, (also known as guessing), occurs prior to induction and deduction. Initially proposed by Charles Peirce at the end of the 19th Century, abductive reasoning is a way to categorize hypothesis ideation (Zimring & Craig, 2001). An abductive hypothesis is one that would, if true, best explain the relevant evidence. A hypothesis arrived at through abductive reasoning can only be made valid by deduction or exhaustive (and typically impossible) induction. Lionel March (1976), wrote that: "A scientific hypothesis is not the same thing as a design hypothesis...a logical proposition is not to be mistaken for a design proposal...a speculative design cannot be determined logically, because the mode of reasoning involved is essentially abductive." In addition to an alternative logic structure, ill-defined problems require different problem solving strategies.

There appears to be a deep-seated difference in problem solving strategies of scientists and designers, even when asked to solve the same problem. Lawson (1979) compared the problem solving strategies of two groups, a senior undergraduate group of architectural students and post graduate science students, when tasked with arranging a set of blocks in color coded combinations. The task also included some hidden rules that disallowed some combinations of blocks. Lawson reported that the two groups displayed very different problem solving strategies (Lawson, 1979).

The key difference in problem solving strategies of the two groups was that the architects focused on the end solution, (i.e. the block arrangement aspect of the problem), while the

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[7] Deductive reasoning, often referred to as 'top-down' is when the truth of the conclusion is purported to follow necessarily or be a logical consequence. Deductive reasoning begins with theory, for example, all men are mortal (the theory), Tom is a man, and therefore Tom is mortal (testable hypothesis that can be observed). This type of reasoning is typically contrasted with inductive reasoning, often referred to as 'bottom-up. Inductive reasoning is probabilistic meaning all evidence to date appears to support the theory, but the logic works backwards from an observation. For example, every swan I have seen is white (observation), therefore all swans are white (non testable); however, this theory is not falsifiable since I cannot see every swan. The possibility of a black swan exists.

scientists directed their attention on discovering the underlying rules of the problem. Lawson's findings supported the argument that the cognitive styles of designers were fundamentally different than those of scientists. Lawson labeled the scientist strategy as 'problem-based' and the architects style as 'solution-based'(Lawson, 2006). Cross (2007a) argues that designers may develop a solution-based strategy because of imposed time constraints to develop a solution. Since not all the necessary information is, or ever can be, available to the problem solver, designers cope with this amorphous problem space by learning to define, redefine and change the problem space themselves by interpreting the problem space through the lens of candidate partial solutions.

A solution-focused strategy is typified by generating a satisfactory solution quickly and then iterating the solution through repeated cycles of comparing the solution to the problem, modifying and molding the solution as need be through the cyclic iteration. This pattern, therefore, results in a co-evolution of solution and problem definition. Additionally, this pattern appears to be normal design behavior exhibited in many studies, especially by experts, across many different design disciplines including engineers, urban designers and architects (Cross, 2007a; Dorst & Cross, 2001; Guindon, 1990; Kolodner & Wills, 1996).

A proposed solution arrived at swiftly then acts as a lens by which designers explore problem constraints. While constraints can include material limitations, structural requirements, aesthetic goals, and cost targets, UX research is explicitly concerned with constraints introduced by end users. Asking designers to utilize UX research is, therefore, asking designers to incorporate additional information from the problem space. Consequently, to maximize a designer's understanding of end user constraints, UX researchers first need to understand what research suggests about how designers think and access information in the problem space for utilization in the solution space. However, this is easier said than done as expressed by Lawson: "Conducting empirical work on the design process is notoriously difficult…the design process by definition takes place inside our heads" (Lawson, 2006).

1.2.2: Relevant studies and findings

In this section, I discuss four dimensions from the design cognition literature that have the potential to influence how designers interact with UX research which in turn led to four initial hypothesis of how individual designers would be expected to interact with personas (with scenarios). Understanding expected designer limitations and abilities when interacting with UX research is part of understanding general and specific design audiences; i.e., the mock designer UX research is targeting. These dimensions include: (1) the possible impact of differences due to variation in design cognition strategies; (2) the likely influences of design expertise; (3) the potential impact of domain expertise and (4) the possible effects of a HCD orientation when engaging with UX research.

1.2.2.1: Dimension one: Design cognition strategies

As discussed in previous sections, much of the literature asserts that designers approach problems from solution-based strategies (Thomas & Carroll, 1979). Additionally, as Lawson (1979) reported, science students took a problem-based approach while design students took a solution-based approach when asked to solve the same problem. However, Kruger and Cross (2006) reported evidence which enhances this binary view of solution versus problem-based strategies with additional nuances; they found that solution-driven and problem-driven strategies lie more on a continuum.

Using protocol data[8] from a Dorst and Cross (2001) study, Kruger and Cross (2006) reused the data to help confirm a model of an expert's product design process; the model was ideated by Kruger (the first author). In the original study, nine experienced industrial designers were asked to think aloud as they designed a litter disposal system for a new train in the

[8] In the design study method designers are brought into a lab environment and asked to complete a design task while 'thinking aloud' to describe their process as they work through the assigned problem. There have been two primary criticisms of think aloud protocols. First, while they work well in studying how participants solve well-defined problems (i.e. Tower of Hanoi), they have been criticized for their efficacy when studying ill-defined problems (Craig, 2001). Second, thinking aloud may increase cognitive load on the participant interfering with the problem solving process and, consequently, not reveal true insights into the actual nature of the problem solving process (Ericsson & Simon, 1993; Lloyd, Lawson, & Scott, 1995).

Netherlands. Kruger's design process model had eight activities: (1) gather data; (2) assess value and validity of data; (3) identify constraints; (4) model behavior and environment; (5) define problems and possibilities; (6) generate partial solutions; (7) evaluate solutions; (8) assemble a coherent solution. These activities were not viewed as sequential steps, but instead formed a series of activity loops. By analyzing the protocol data, they found that all of the designers spent most of the time in three dominant activities listed here in descending order, generating partial solutions (activity 6 – solution focused), identifying constraints (activity 3 – problem focused) and gathering information (activity 1 – problem focused). However, designers varied in the *proportion* of time spent in each of the eight activities; these differences were not related to level of experience (Kruger & Cross, 2006).

All nine of the designers spent the MOST time in partial solution generation (activity 6) so ALL could be described as being generally solution-focused problem solvers; however, the authors argued that cognitive design strategies could be more finely delineated. The first demarcation was between the previously discussed variants, problem-driven versus solution-driven. They also identified two sub-variants for each style. A variant of problem driven design is information driven design; a variant of solution-driven design was knowledge driven design.

In the problem-driven design approach, the designer placed an emphasis on defining the problem; these designers spent more time in the first activity (gathering data) and the third activity (identifying constraints) compared to the other designers. In the sub-variant, information-driven design, designers focused on gathering information from external sources; these designers spent more time in the first activity (gathering data) compared to the solution-driven groups.

In the solution-driven strategy, designers emphasized solutions, and only gathered the minimum amount of data they needed to move forward with a solution. These designers had high frequencies in the sixth (generating solutions) and eighth (assembling solutions) activities compared to the problem-driven groups. In the sub-variant, knowledge-driven design, designers used prior knowledge to help build solutions and only used minimal amounts of external

information; these designers spent more time in the modeling activity compared to the other designers. The solution driven group produced a greater number of solution ideas in the study.

The authors note that the use of one strategy over the other was not associated with the quality of the solution as judged by a team of independent skilled judges (five design teachers from Delft Faculty of Industrial Design Engineering, all who were also practicing designers). End solutions were scored on the basis of aesthetic, technical, commercial, ergonomic and creative scales. While designers categorized as solution-driven created products with an overall lower score, they scored higher on the creativity scale; the authors argue that this may be due to the greater number of solutions this group created. Designers categorized as problem-driven had the best overall scores on their solutions. These findings suggest that cognitive strategies are related to how a designer interacts with material in the problem space; this hypothesis explored in greater depth in the next sub section.

1.2.2.1a: Designer hypothesis one: cognitive strategies are related to how designers interact in the problem space. Following this hypothesis, designers categorized as the problem-driven or the sub-variant of information-driven will have greater proclivities to interact with information from the problem space; a problem space which includes UX research. The Kruger and Cross (2006) study indicated that the differences between a problem-based strategy and a solution-based strategy were not binary, but instead on a continuum. A designer leaning towards a problem-driven cognitive strategy, especially the sub variant of information-driven may be associated with an inclination to utilize UX research data. In particular, I ask in this dissertation, is there an association between what a designer (self-reported) claims to be their dominant strategy versus their observed and/or reported interactions with UX research data?

1.2.2.2: Dimension two: Designer variations: novice and experts

By far, the most studied distinction among designers is on the novice versus expert continuum. Much of the research in this area is intended to guide educators in ways to help their novice design students move as quickly as possible to expert levels. The concept here is, if we know how experts think, then, we can teach novices how to think like experts. Many of the key differences between novices and experts are tied to the fluidity by which designers can move

between problem spaces (i.e. information gathering, understanding constraints, etc.) and solution spaces (i.e. generation of potential solutions/partial solution, solution evaluation, etc.). Some of these differences may be explained by naive understandings concerning what comprises design activity.

Newstetter and McCracken (2001) found that their beginning level engineering students shared many common misconceptions about design activities. Especially important for this discussion, they found that younger students displayed a 'design arrogance' which they describe as ignoring the constraints of the user; instead, the students designed for themselves. Many studies have also found that novice designers approach design problems much differently than experts.

Unlike experienced designers, students and novices have been observed to approach design problems as though they were well-defined and consequently do little elaboration to explore the problem space (Rowland, 1992). Additionally, since the problem is viewed as well-defined, students often will sequentially identify and explore sub-solutions in depth, and in the meantime, become over involved in partial solutions. This approach is referred to as 'depth-first' which is contrasted with an expert's 'breadth-first' approach (Akin, 2001).

Akin (2001) argues that expert architects take a breadth-first approach because they have a greater ability to retain larger chunks of information. He found that experts generated many more problem structures and alternative solutions from taking a breadth-first approach. The reported variations in approach are closely related to differences found in how novices and experts engage the problem space.

There have been mixed reports as to what exactly is the basis of the novice's ineffective engagement with the problem space. Some report it related to simply time spent, for example, Christaans and Dorst found that novices tend to scope out the problem less and seek less information than experienced designers (Christiaans & Dorst, 1992). However, other researchers have found that effective problem space engagement is more nuanced. In a study comparing freshman and senior engineering students in a playground design exercise, Atman, Chimka, Bursic & Nachtmann (1999) found that freshmen who spent *more* time in the problem definition

and information gathering phase produced *worse* results. The freshman appeared to be hindered by attempts to understand the problem before they started generating solutions. While seniors, as a group, did not spend more time than freshman in the problem space, the senior students were able to gather more information across more categories. Further, quantity of information correlated to higher quality designs (Atman, Chimka, Bursic, & Nachtmann, 1999). Therefore, it was the quality of time spent in the problem space, not the amount of time spent.

In an extension, and a confirmation of the study above, Atman, Adams, Cardella, Turns, Mosborg & Saleem (2007) asked 19 expert engineers to respond to the same playground design problem; playground design was a novel domain for the professional engineers. The researchers then compared the expert results to those of the students, expecting the behaviors noted in the successful seniors in the first study would be present to a greater degree in the professionals. Compared to the seniors, the professionals spent more time in the problem space in the initial phases and iteratively returned to the information, displaying a greater flexibility between problem and solution spaces (Atman, et al., 2007). Additionally, the professionals gathered significantly more information across more categories than the senior students. These findings support Akins hypothesis which suggested that as designers mature their ability to gather more information from the problem space increases due to their ability to retain larger chunks of information.

In sum, these studies that have compared novices and experts support a distinct pattern of maturation associated with the ability to gather and consider more and more information in the problem space. Very inexperienced students have been known to display 'design arrogance' and simply ignore much information from the problem space, including user constraints (Newstetter & McCracken, 2001). As designers mature, their approach changes to a breadth-first method which permits the generation of more problem structures, a more meaningful engagement in the problem space and, consequently, they generate more candidate partial solutions (Akin, 2001). Additionally, research has found that effective use of the problem space is correlated to higher quality solutions.

Design cognition research suggests that the capacity to engage in the problem space has four overlapping phases: (1) the utter novice does not engage in the problem space long, gathering minimal information and then jumping quickly to a solution without carefully considering the problem (Rowland, 1992); (2) as designers gain experience their capacity to consider information increases, however some become overwhelmed and drown in the information at this point (Atman, et al., 1999); (3) there seems to be a tipping point at which designers become aware of their own capabilities in the problem space; and (4) once designers have learned their capabilities they can afford to consider more problem information while proceeding forward with a design (Atman, et al., 2007). In other words, as the individual operations of design collapse into larger chunks of activity, the expert designer is liberated which in turn allows a more thorough engagement with materials that define the problem (Akin, 2001).

1.2.2.2a: Designer hypothesis two: how designers solve design problems is related to their level of expertise, specifically, novice users are less effective in utilizing the problem space. Following this hypothesis, the willingness to engage with UX research will be positively associated with experience. Very inexperienced designers can be expected to engage with UX research information minimally before proceeding to an initial concept. Designers with more experience would be expected to review the data more thoroughly; however, if they are only somewhat experienced they may become overwhelmed by the information. Specifically, in this dissertation I investigate possible associations between levels of designer experience and observed and/or reported interactions with UX research data.

1.2.2.3: Dimension three: Experts in novel domains

Studies observing experts in novel domains are attempting to understand what patterns and components of expert design processes generalize to other domains of inquiry. While some studies have found that experts bring existing strategies to novel problems (Cross & Cross, 1998; Schraagen, 1993), other research has found not all design strategies generalize; some of the specific patterns of the design process change.

Adelson and Soloway (1985) observed experienced designers in three computer programming conditions: (1) designing a familiar object in an unfamiliar domain (email system);

(2) designing an unfamiliar object in an unfamiliar domain (library system); and (3) designing a familiar object in a familiar domain (interrupt handlers). They found that their expert participants followed a similar process regardless of the domain; but the level of familiarity affected patterns of behavior (Adelson & Soloway, 1985). Adelson and Soloway defined a domain as corresponding "to the general classification of the system according to its use." In their study, for example, they classified the electronic mail system in the domain of 'communications systems'.

The researchers found that expert designers assessed the quality of their partial solutions in a global manner only in familiar domains. The authors called this type of assessment 'simulation'; global simulation was indicated when designers demonstrated an understanding of how the components of their design were interlinked. In other words, a global simulation indicated a breadth-first approach as opposed to a depth-first approach to design. They found that global simulation was only possible if the designer had domain experience. Domain experience, the authors argue, provides the necessary knowledge to assess if candidate partial solutions are tenable. Additionally, the designers approached the unfamiliar domain problem (the library system) 'non-globally', indicating that simulation process reflected a depth-first approach. The ability to pull back and extract the gist of the design problem appeared to be overwhelmed by the number of new details the designer has to keep in mind in an unfamiliar domain. Another indication of the formation of a working model that could support global simulating was 'systematic expansion.' Systematic expansion was demonstrated when all the components of the design were abstracted to a similar level.

There were other pattern differences found between the three conditions. If the object was unfamiliar, as in the email and library task, designers developed their own constraints (i.e. determining what the system needed to include) early in the design process to help frame the solution. If both the object and the domain were familiar, as was the case with the interrupt handler, designers glossed over some of the steps observed in the other two conditions. For example, designers avoided the global simulation phase altogether presumably because a

successful solution was retrieved from memory and did not need to be moved into the solution space for evaluation.

Note-making, which the authors defined as when a designer makes notes to him/herself about concerns s/he is having about constraints, only occurred in relation to simulation. Simulation, therefore, only occurred in the creation of the email system (familiar object in an unfamiliar domain). This finding indicates that notes are more valuable when designers have at least partial previous experience in the domain or object type. In other words, notes are useful when designers know enough to know what they might be missing; however, they are not useful when the object and the domain were both familiar or in the cases where the object and domain were both unfamiliar. Together, these findings suggest the hypothesis that an expert designer behavior in a novel domain is different than when in a known domain.

1.2.2.3a: Designer hypothesis three: a designer in a novel domain behaves differently than when in a known domain. There are two types of expertise explored in this research (1) object and domain and (2) audience. In this research, I explored how levels of domain, object and audience familiarity interacted with how designers engage with UX research. I hypothesized that there would be a relationship among object, domain and audience expertise and how the designers interacted with the personas (with scenarios).

1.2.2.4: Dimension four: HCD orientation

Design experience and domain expertise are two areas likely to influence a designer's ability to utilize UX research; however, I hypothesized that HCD orientation would also influence a designer's proclivity and capacity to engage with UX research. Over twenty years ago Gould and Lewis investigated HCD orientation by determining how often designers reported incorporating end users in their process. While HCD methods are more prevalent in the literature today, the Gould and Lewis study participants could be assumed to be at least partially oriented to a HCD philosophy since the participants came from groups who were attending a conference on human factors.

The researchers separated designers in their study on the degree by which designers mentioned involving the user. They argue that designers should use three principles[9] in order to create useful and usable computer systems: (1) early focus on the user, (2) empirical measurement, and (3) an iterative design process (Gould & Lewis, 1985). Early focus on users included interviews and observations of users engaged in the system. Empirical measurement included testing both the usability and learn-ability of computer systems. By iterative design, they were endorsing the use of prototypes to engage users early and often in the design process. The authors tested designers on how much they reported alignment to these three principles.

They asked their participants, composed of system planners, designers, programmers and developers to write down (in five or so basic steps) the sequence by which they used to develop and evaluate a computer system. Using a very liberal scoring system, their results were not very encouraging: only 2% mentioned all three principles and 26% did not mention any of the three principles. As part of this dissertation, I also evaluated associations between how designers used or reported using personas and the designer's alignment to the Gould and Lewis HCD principles.

1.2.2.4a: Designer hypothesis four: HCD orientation will affect UX research engagement. I investigated if there is an association between a HCD orientation (operationally defined by a score on the Gould and Lewis test) and observed and/or reported interactions with UX research data.

1.2.2.5: Summary

In summation, these four dimensions from design cognition research (design cognition strategies, design expertise, domain expertise and HCD orientation) may interact with a designer's proclivity, ability and capacity to engage with UX research. The four dimensions represent potential important information UX researchers might need to understand about their

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[9] The authors later added a fourth principle which they call 'integrated design', described as "all aspects of usability (e.g. user interface, help system, training plan, and documentation) should evolve in parallel, rather than be defined sequentially, and should be under one management." (Gould, Boies, & Lewis, 1991). This additional principle has not received the recognition that the initial three principals have in the HCI community so is not included here.

audience (designers) to create an effective mock designer representation before creating communication artifacts such as personas and scenarios.

1.3: Theoretical frameworks: conclusions

While rhetorical theory is the foundational framework for this dissertation, theories derived from design cognition provide a lens to focus understanding of the designer role in the UX Researcher-Designer-User triad of communication. The field of design cognition research is focused on understanding how designers think. Rhetorical theory suggests that UX research needs to understand their audience (i.e. mock designer). I argue that in order for UX research to construct a well developed mock designer image and increase the effectiveness of communication (e.g. personas and scenarios), theories derived from design cognition need to guide an understanding in the UX Researcher-Designer relationship, see Figure 2.

Rhetorical theory establishes that communication is essentially a negotiation between the message encoder and the message recipient; therefore, a user message encoded through personas and scenarios is a negotiated message. This has different meanings for the Designer-User relationship than it does for the UX Research-Designer relationship. In the Designer-User relationship, rhetorical theory suggests that a clear and focused negotiated user message (mock user) will help designers create a clear and consistent user interface. This in turn will help the real user accept the role of mock user, which will ultimately result in a better user experience.

The same framework can be applied to the mock-designer creation. In other words, an understanding of typical design behavior, made possible by design cognition research, helps UX researchers have a more focused designer construct for communicating and encoding the end user message. However, the UX Researcher –Designer relationship can go one step further than the Designer–User relationship. Since the communication between researchers and designers is typically more intimate than that between designer and end user, it is possible for UX researchers to strive for an understanding of the variants that exist in the designers with whom they are working, including an understanding of the designer's knowledge which will form the basis from which they will be decoding the user research message. This reaches beyond just a general understanding of designer behavior and asks what should researchers strive to understand about

designers? For example, understanding cognition strategies (problem or solution driven), design experience, domain expertise and HCD orientation that each individual designer in a team possesses will lead to a greater understanding of what affects a designer's proclivity, ability and capacity to utilize UX research.

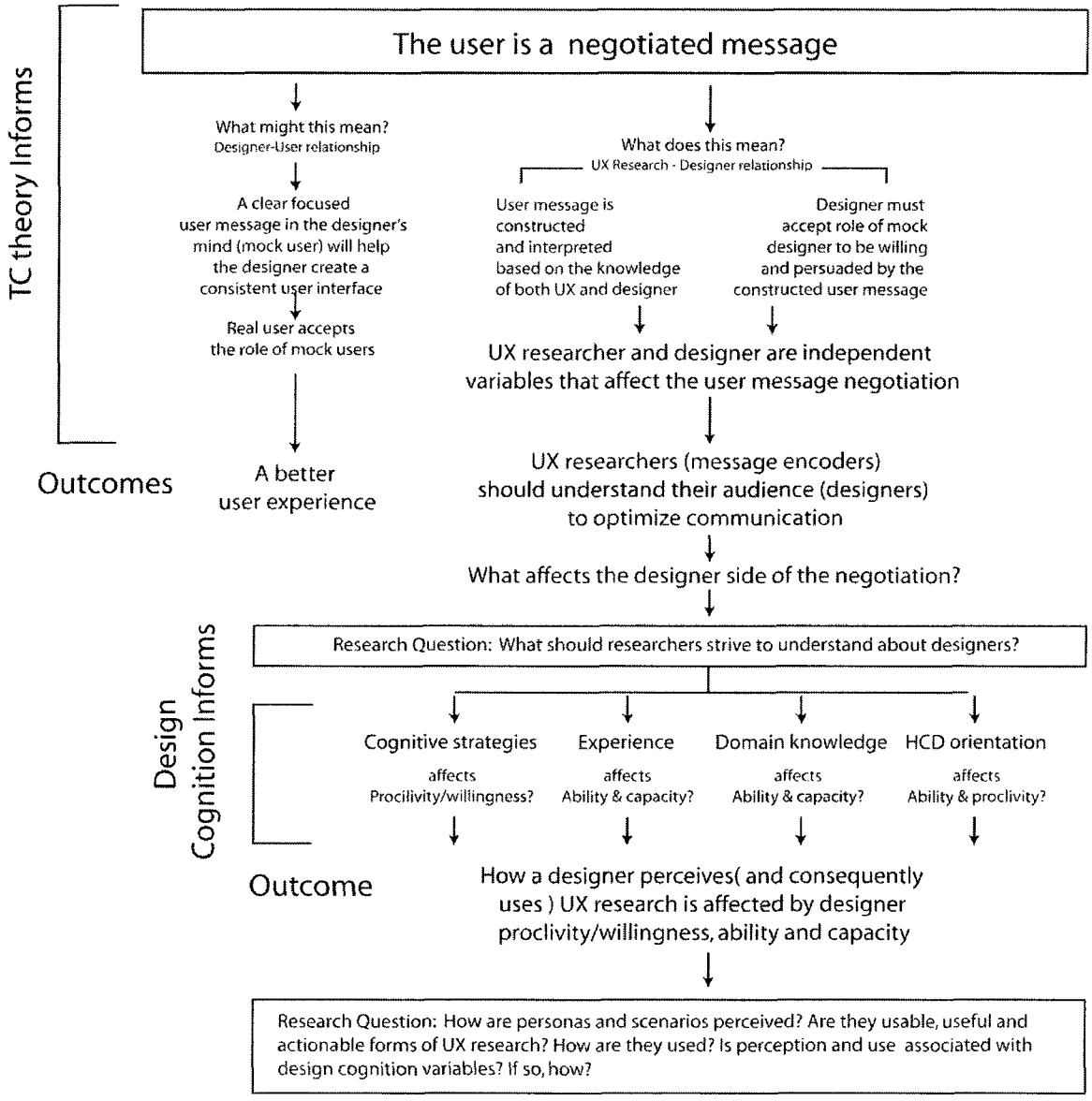


Figure 2: Theoretical frameworks

Lastly, rhetorical theory stresses the importance of the designer's perception and related persuasive qualities of personas and scenarios if they are to be effective (useful, usable and

actionable) conduits of the end user. To help bridge the gap between the designer and end user, UX research cannot expect to simply throw their findings over a wall to designers, but instead provide the means (and hopefully the desire) for designers to cross that bridge. The movement to rationalize design experienced a backlash in the 1970s which Cross (2007b) argues was partially due to the lack of success in integrating the scientific approaches into everyday design practice. Learning from this experience, UX research must strive to be relevant in everyday design practice.

In this dissertation, I investigated the relevance of UX research when it is summarized by personas and scenarios. In other words, how are personas and scenarios perceived by designers? Are they considered usable, useful and actionable forms of UX research? How are they used? Is perception and use associated with the design cognition variables I have outlined here? Disambiguating the variables that contribute to the utility of personas and scenarios will help better communication between UX research and design in HCD practice and ultimately lead to better end-user experiences.

Chapter 2: Personas and scenarios

Many of the authors contributing to HCD literature concerning personas and scenarios are very enthusiastic as to the effectiveness of personas (with scenarios) as both summarizations of end users (as mock users) and as persuasive communication conduits between UX researchers and designers about end users. However, there has been very little reflection about how or under what conditions personas and scenarios are effective. Recall that the primary research questions driving this investigation are concerned with how (or if) designers incorporate personas and scenarios into their design processes. In other words, are personas effective mock user constructs? Does the addition of scenarios expand the utility of the mock user construct by introducing context? What can make them more effective, more useful, and more usable? Additionally, little is known about what variables might affect their usefulness and usability; variables which include those informed by design cognitions studies (i.e. design cognition styles, design experience, domain expertise and HCD orientation). However, before answering the primary research questions driving this investigation, I first establish what constitutes a persona and how scenarios were defined in this chapter.

As I investigated the literature pertaining to personas and scenarios, I discovered important differences between the content and the general tone of popular literature (mostly books) versus the academic literature (mostly journals and conference proceedings). First, almost all of the instructional literature which discusses how to actually create personas and scenarios are from popular literature. In addition, as to be expected, the tone of popular literature is one of promotion and enthusiasm in an effort to sell the reader on persona and/or scenario use. Conversely, while there are notable exceptions, most of the negative reflection concerning personas and scenarios as HCD methods comes from the academic literature. Consequently, the general tone of the academic literature is more skeptical, although there are notable exceptions.

To provide background information, I discuss the literature pertaining to persona/scenario reflection and analysis in this chapter in more depth. I present more detail about the literature on how to create personas and scenarios in Appendix A. This is presented in concert with the discussion of how I modified some suggested steps due to challenges presented by the circumstances and data that were available for the personas representing mobile users in Kyrgyzstan. In the following sections, I discuss personas (section 2.1) and scenarios (section 2.2).

2.1: Personas

A persona is a composite archetypal character (also known as a user model or profile) that is derived from UX research. In other words, personas are a summation of research data in which each persona represents a group of users who share common goals, attitudes and behaviors when interacting with a particular product or service (A. Cooper, et al., 2007; Mulder & Yaar, 2007; Pruitt & Adlin, 2006). Much of the literature agrees that the popularization of personas began with a brief mention by Alan Cooper in his 1999 book, "The Inmates are running the Asylum: Why High Tech Products Drive Us Crazy and How to Restore the Sanity" (Adlin, et al., 2006; A. Cooper, et al., 2007; Pruitt & Adlin, 2006). In the following sections, I will first discuss claims made in the literature about persona utility in the design process (section 2.1.1), followed by a discussion of the criticism and concerns about persona creation and use (section 2.1.2).

2.1.1: Claims of persona utility

There are multiple positive reports in both the popular literature (A. Cooper, et al., 2007; Mulder & Yaar, 2007; Pruitt & Adlin, 2006) and the academic literature on persona use in technical product design and development (Chang, Hsu, & Wang, 2008; Dantin, 2005; Hill & Bartek, 2007; Junior & Filgueiras, 2005; Markensten & Artman, 2004). Claims of why personas are effective summarizations and communicators of mock users fall into four major categories: (1) personas provide a clear *focus* of the

user audience (section 2.1.1.1); (2) personas facilitate improved *communication* about users (section 2.1.1.2); (3) personas increase *empathy* with end users (section 2.1.1.3); and (4) personas act as an aid for *avoiding ill-informed assumptions and stereotypes* about users (section 2.1.1.4). The reasons personas fulfill these enthusiastic claims, proponents argue, is due to the human ability to engage with fictional characters. Fictional character engagement can be routinely seen in how audiences respond emotionally to, and make inferences about, characters in books, television shows, and movies (Grudin, 2006). Discussion of each of the common claims is expanded below, followed by a summary (section 2.1.1.5).

2.1.1.1: Focus

Many proponents argue that personas provide constraints on user populations so that the design team can focus on a specific subset of users (Adlin, et al., 2006; A. Cooper, et al., 2007; Head, 2003; Kuniavsky, 2003; Pruitt & Adlin, 2006). In other words, focus helps designers create mock user images. Focus emancipates the design team from problems that might arise when considering a full spectrum of end users and allows the team to concentrate on the highest priority set of user goals and needs. Cooper et.al. (2007) argue that it is better to design for one person than vaguely for everyone. Kuniasvksy (2003) adds that, "by defining an audience too broadly, you are not defining it at all." Rhetorical theory suggests that a clear audience focus also leads to the creation of consistent clues in the interface that helps real users adopt the role of the mock user(s) represented by the persona(s).

2.1.1.2: Communication

Proponents contend that personas provide a communication channel for conveying a wide range of quantitative and qualitative data (Pruitt & Grudin, 2003). Clear communication in turn facilitates consensus and efficiency in design team decision making (Mulder & Yaar, 2007). Additionally, personas can assist succinct communication about users beyond the design team to other stakeholders within the organization (Pruitt & Adlin, 2006). By making the assumptions about users explicit,

personas can also provide a clear benchmark measuring a design's effectiveness (A. Cooper, et al., 2007) and provide guidance for choosing participants in later usability studies. In other words, proponents suggest that by making end users explicit, personas put all of the design team on the same page. By keeping the design team on the same page throughout the design process, personas facilitate better communication resulting in better decision making.

2.1.1.3: Empathy

A common claim in the literature is that personas empathetically engage the designers to understand a user's perspective (A. Cooper, et al., 2007; Mulder & Yaar, 2007). Cooper et.al. (2007) argue that empathy with end users is critical for designers as they make decisions based on the "cognitive and emotional dimensions" of the personas. The authors equate persona empathy to method acting, which is a tool actors use to get into the skin and empathize with the characters they portray. Mulder and Yaar (2007) argue that personas address the need for designers to recognize they are not the user, "personas help you live in your user's shoes...when you face a decision, you might imagine what [persona name] would want to do in this situation, not what you want." Grudin & Pruitt (2002) contend that personas take advantage of our ability to "extrapolate from partial knowledge of people to create coherent wholes" which in turn forms a holistic image of the user in the mind of the designer, that the designer can mentally transport into new situations and settings. Persona proponents argue that the more a designer engages with the persona, the more empathy he will have for the end users represented by the persona. In turn, the user interface will be more aligned to real user needs and goals.

2.1.1.4: Avoiding ill-informed assumptions and stereotypes

In the void of user research, designers have only their assumptions and intuitions to guide their work. Goodwin (2002) argues that "the whole point in creating personas is to get past our personal opinions and presuppositions." Additionally, all designers carry biases and assumptions about end users. Pruitt and Aldin (2006) argue,

"Whether or not you surface these assumptions, they will affect the design and success of your products." Furthermore, design based on ill-informed assumptions can lead to design for oneself. Rubinstein and Hersh argued that "In the absence of detailed information, we work from assumptions about who the user is, what he or she does, and what type of system would meet his or her needs.... following these assumptions, we tend to design for ourselves, not for other people" (Rubinstein & Hersh, 1984). Persona proponents argue that if designers are convinced by the persona data, then their biases and assumptions will be replaced by personas, i.e. data-driven mock users.

2.1.1.5: Summary: Beneficial claims of personas

If personas meet all of their claims, then proponents assume that designers will have an actionable construct of the user (mock user) in mind. All of these claims are intended to better the Designer-User relationship in the technology communication triad described in Figure 1. A clear focus will lead to a consistent interface with clear and salient cues to guide the high priority users. Good communication will lead to better and more efficient decision making during design. Empathy will lead to an interface that is more aligned to real user's needs and goals. Avoiding ill-informed assumptions/stereotypes challenges designers to reconsider their initial suppositions about end users. In turn, if all these claims are met, an improved user experience is expected. However, there are also negative reports of persona use in the literature.

2.1.2: Criticisms and concerns about personas

Personas also have many critics who have reported negative experiences and opinions about personas, questioning persona usefulness and effectiveness in the design process. Critiques are primarily from the academic literature (Blomquist & Arvola, 2002; Chapman & Milham, 2006; Portigal, 2008; Rönkkö, Hellman, Kilander, & Dittrich, 2004). In the literature review, I found six general categories of concerns and criticisms about persona creation and use: (1) personas overly abstract the user (section 2.1.2.1); (2) personas are not believable (section 2.1.2.2); (3) persona creation requires

the specialized skill set of a social scientist (section 2.1.2.3); (4) personas may be overused and can become stale (section 2.1.2.4); (5) designers need training and/or experience to use personas as envisioned by persona proponents (section 2.1.2.5); and (6) personas will only be accepted and used if they align to previous stereotypes that designers already maintain (section 2.1.2.6). Each of these concerns is described in more detail below followed by a summary (section 2.1.2.7).

2.1.2.1: Personas overly abstract the user

Portigal (2008) feels that personas dehumanize end users by representing them too neatly, and implores HCD advocates to "look for ways to represent research in a way that maintains the messiness of actual human beings - no tool, no method and no shortcut can substitute for real in-person interactions." This is also a perspective shared by proponents of participatory design (PD) where users are included as full partners in the design process acting as members of the design team (Muller, 2003; Törpel, 2005). While I am not concerned with articulating all of the differences between PD and HCD approaches here, the abstracted/summarized user (i.e. persona) is a central departure between these two participatory approaches to design.

2.1.2.2: Personas are not believable

Personas have been accused of being a fiction that is not believable, because they were either regarded as based on fictional data, or their relationship to data was unclear (Rönkkö, 2005). Some have argued for more quantitative and objective methods to remove the "subjectivity inherent in persona creation" (Chapman, et al., 2008; Chapman & Milham, 2006; Mulder & Yaar, 2007) .This debate has the potential to undermine persona persuasiveness quality for some designers (Pruitt & Adlin, 2006).

Further, Chapman and Milham (2006) suggest that it is difficult to know how many real users a persona represents. The authors feel that without multivariate statistics, which require large sample sizes, it cannot be known if the persona represents a million users or one. Additionally, these researchers posit that personas

need to be "falsifiable," applying a positivistic requirement from physical sciences for personas to be considered valid. While this is an unrealistic and naive understanding of social science, concerns about objectivity and rigor are valid if the perception of methods has persuasive qualities for persona end users (i.e. designers).

2.1.2.3: Personas creation requires special skills

Others have expressed concerns that the specialized skills of a social scientist are required to create personas (Blomquist & Arvola, 2002). This makes personas an expensive luxury that few production processes can afford.

2.1.2.4: Personas can be overused and become stale

Pruitt and Grudin (2003) express concerns over the reuse and over-use of personas for too many products. In their work at Microsoft, they have witnessed diminished persona utility for any one product as a result (Grudin & Pruitt, 2002; Pruitt & Grudin, 2003). Head (2003) also warns against recycling personas for new projects. Furthermore, Portigal (2008) contends that personas cannot keep up with the moving target of an end user resulting in a stale and ineffectual user representation.

2.1.2.5: Designers need training and/or experience to use personas

In a study observing persona use by designers, Blomquist and Avorla (2002) found that their participant designers did not know how to utilize persona information. Additionally, the personas were never integrated into the participant's design process and the participants were never comfortable with using personas. The authors' concluded that: (a) designers need training to use personas; and (b) personas need to be created specifically for designer capabilities, writing that "for a method to work properly it must be tweaked to fit the designers that utilize it" (Blomquist & Arvola, 2002).

2.1.2.6: Personas are only accepted if they align to a design team stereotypes / existing assumptions

Chapman and Milham (2006) argue that if personas do not align to a design team's preconceived ideas, then they will probably be rejected. Since stereotyped formation is a natural consequence of the way the human memory works, they argue that personas simply activate a previous stereotype or assumptions. Additionally, they cite the concept of 'confirmation bias' in psychology that asserts that people tend to notice confirming evidence and overlook disconfirming evidence; this suggests designers will actively seek evidence to support their previously held stereotypes and ignore the content of personas.

In further evidence that personas can function as assumptive confirmation conduits, Rönkkö (2005) expanded the Blomquist and Arvola's study, and searched for project conditions that interact with persona usefulness. Rönkkö observed personas use in three student (i.e. novice designers) design projects and found that personas were not used as expected by persona proponents. The author claimed that in all of the projects, personas "functioned as an internal concept in the discussions between interaction designers and to justify design rationales 'after the fact' to other project members, as if they actually were based on the persona." In other words, the personas were vessels in which the (student) interaction designers filled their own ideas (ill-informed assumptions) about users to justify design decisions to the other members of the design team. Since her findings are based on first time personas users, the findings may be a further indication that experience with personas may be an important ingredient to their success, as opposed to a reliable demonstration of the failure of the persona method. Additionally, her findings suggest that the potential for stereotype confirmation may be greater with designers who are inexperienced with the method.

Avoiding ill-informed assumptions and stereotypes is one of the chief claims of personas. If it is not possible, as Chapman and Milham (2006) suggest, then the utility of personas is reduced. Their effectiveness of conveying UX research is diminished if

they only work to activate existing knowledge; personas in fact become dangerous to use if they are simply justifications for confirming existing assumptions.

2.1.2.7: Summary of personas criticisms

In summation, this section on personas discussed enthusiastic claims made of personas in the literature that helped guide some of the interview and survey questions I used in this research. Next, I detail criticisms and concerns about persona use and misuse. However, most studies I found analyzing personas utility did not consider the fact that proponents of personas typically suggest that personas should not be employed as user summarizations in isolation. Major proponents all emphasize that personas need scenario stories to reach their highest potential as summarizations of user data (A. Cooper, et al., 2007; Grudin & Pruitt, 2002; Mulder & Yaar, 2007; Pruitt & Adlin, 2006). In the next section, I will discuss scenarios.

2.2: Scenarios

A scenario used in the HCD context is a story describing a character in an activity in relation to a product (Carroll, 2000a; Go & Carroll, 2004; Quesenbery, 2006; Rosson & Carroll, 2003). Cooper et.al. (2007) emphasized the need to include personas as the main character of scenarios because personas provide an empathetic center to the story. Where personas describe the individuals that will interact with a product, scenarios describe the content and context of an idealized interaction.

In this investigation, I focused specifically on how designers consider users as they do their work; i.e., how do they form their mock user image, and how personas and scenarios work to help or hinder the formation of the mock user image. Therefore, I investigated scenarios as an adjunct to personas.[10]

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[10] Many of the claims made of scenario utility concentrate on how scenarios aid the design process, but do not discuss how they help designers keep the user in mind. For example, John Carroll (2001), a long standing advocate of what he coined 'scenario-based design', argues that one of the many benefits of scenarios is that they can help designers imagine a future system in which the technology has not been invented. This potential outcome of scenario use directly benefits designers in their process, (i.e. imagining technical possibilities) but is not focused on helping designers keep users in mind.

As part of this investigation I found that the term 'scenario' has many different meanings depending on the discipline and granularity of detail the scenario represents. The next sections I discuss variations in the meaning of the term 'scenario' (section 2.2.1), claims of scenario utility (section 2.2.2), concerns about using personas without scenarios (section 2.2.3), followed by a summary (section 2.2.4).

2.2.1: Scenario variations

HCD is only one of the disciplines that utilizes scenarios. Other disciplines that use the term "scenario' but with different meaning include strategic planning, requirements analysis and engineering, and object-oriented design (Go & Carroll, 2004). Each of these disciplines focuses on telling scenario stories but varies from typical scenario use in HCD in that the scenarios: (a) are told from a different perspective; (b) are concerned with different timeline projections into the future; and (c) are used for different functions. To clarify what I mean when I use the term 'scenario' in this dissertation, these variations are briefly detailed in the next sections.

2.2.1.1: Strategic planning scenarios

Scenarios in the HCD context are an adaptation of scenario-based approaches used first in planning and management (Go & Carroll, 2004). Often referred to as 'what-if' scenarios, strategic planning scenarios describe possibilities that facilitate decision making about alternative approaches to possible events years in the future (Kahn, 1962). They are told from the perspective of an organization, and typically project imagined events far out into the future, frequently for a year or more.

2.2.1.2: Requirements analysis and engineering scenarios

Scenarios used for requirements analysis and engineering are intended to specify user requirements for interactive systems. These scenarios are focused only moments in the future and are concerned with keystroke commands and task order. These types of scenarios tell the story of a computer interaction from a system's

perspective. Seminal work in this field includes the 'Inquiry Cycle model' (Potts, 1995).

2.2.1.3: Object-oriented design scenarios

Scenarios used for object-oriented design are intended to help developers to program interactive systems. Object-oriented design scenarios help developers identify objects, data structures and class hierarchies that define objects within the system and how the objects will interact (Go & Carroll, 2004). Much like those used in requirements analysis, scenarios used in object-oriented design look only moments into the future, describing possible paths users might take when using an interactive product or service. Object-oriented design scenarios also narrate their interactive tale from the perspective of a system object. There are three commonly used approaches/methods: (1) use case approach (Jacobson, 1995); (2) 'Responsibility-driven design' approach (Wirfs-Brock, 1993, 1995) and (3) automated modeling approach (Koskimies, Systä, Tuomi, & Männistö, 1998).

2.2.1.4: Scenarios in the HCD context

Scenarios in the HCD context are told from a user (persona, in the context of this research) perspective and can describe anywhere from a few moments to an entire day of interaction with a product or service. Cooper et.al. (2007) label these types of scenarios used in early phases of the HCD process, as 'context' or 'day in the life' scenarios. This is the type of scenario that I am focusing on for this dissertation. From this point on, I will refer to these types of scenarios as 'context scenarios' to disambiguate their meaning from scenarios used in other disciplines and those used later in the development process. In their 'Goal-Oriented™ Design' approach, Cooper et.al (2007) suggest that context scenarios are created early in the design process *before* any design is performed. The authors contend that context scenarios are used to "explore, at a high level, how the product can best serve the needs of the personas," and "help create initial user requirements before the specifics of the product are understood" (A. Cooper, et al., 2007).

2.2.2: Claims of context scenario utility

Persona advocates argue that the addition of context scenarios helps designers keep the user in mind (i.e. mock user). Quesenberry (2006) suggests that stories are an important augmentation to personas because stories are effective at communicating culture and transmitting persona information into a memorable format. Proponents also suggest context scenarios are effective additions to personas because people are pre-wired to receive complex information through storytelling (Grudin, 2006; Quesenbery, 2006).[11]

2.2.3: Concerns about scenarios without personas

Several authors have argued against using scenarios without personas (A. Cooper, et al., 2007; Grudin & Pruitt, 2002; Mikkelson & Lee, 2000; Pruitt & Adlin, 2006). Mikkelson and Lee (2000) argue that scenarios without a character description (i.e. persona) assume the reader understands relevant details about the user. Consequently, critical details such as user motivation are expected to be inferred by the reader. Grudin & Pruitt (2002) contend that while scenarios are capable of describing work practices well, without main characters, i.e. personas, they are not engaging enough to employ designer imagination.

2.2.4: Summary

In summation, in this section on scenarios, I explained how HCD context scenarios are differentiated from those in other disciplines. HCD context scenarios focus on interactions from a user perspective; in the context of this investigation, from a persona perspective. Additionally, context scenarios span less time than strategic planning scenarios, but usually more than those used in requirements analysis and object oriented programming. Finally, context scenarios are explicitly intended to

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[11] For more on how scenarios aid the design process see (Carroll, 2000a, 2000b, 2001). As explained above, I am focusing on how scenarios help designers keep users in mind whereas Carroll focuses on how scenarios help the design process.

communicate different types of information from those in other technical related disciplines. They are intended to help designers keep the users in mind. Conversely, scenarios in other technical related disciplines are meant to inform designers about the system, or in the case of scenario-based design, they aid the design process.

Traditional scenario-based design (versus context scenario use) has been criticized for lacking a main character; therefore lacking the ability to empathetically engage designers. Persona proponents argue that context scenarios are a powerful adjunct to personas by going beyond a mere description of the user, by describing the user in an activity in relation to a product or service. Proponents also claim context scenarios work as conduit of user information because humans are predisposed to consuming information via storytelling.

2.3: Personas and Scenarios: conclusions

Personas and context scenarios are created to make envisioned user interactions with technical systems explicit. Persona proponents argue that they work well together; personas provide the actors that represent users, scenarios provide the context describing user activities in relation to a product or service. In this investigation, I explored their utility as summarizations and communication conduits of user research.

If personas and context scenarios are effective at improving the Designer-User relationship, as their proponents claim, then it is clearly dependent on many variables – variables this dissertation hopes to help disambiguate. However, it is impossible to actually measure the impact of personas and scenarios on a design process, as Mulder and Yaar (2007) recognize when they state, "did personas cause that 22% rise in conversion rate or was it the usability test you ran, or the senior designer you hired?...It is more likely a combination of factors." The authors call for a 'controlled experiment' to measure persona results. Other authors have discussed the return on investment (ROI) for HCD methods and UX research in more detail (Bias & Mayhew, 2005).

While a controlled experiment to determine the ROI of personas and scenarios is beyond the scope of this dissertation, rhetorical theory suggests that for personas and

context scenarios to be effective conduits of the negotiated mock user they need to: (1) guide designers towards creating a consistent clear interface for the mock user which will in turn help the real user adopt the role of the mock user; (2) be understandable and usable by the intended audience (i.e. designers) which in turn requires an audience analysis; and (3) be credible to designers so they are persuaded to utilize them and accept the role of the mock designer. In the next chapter, I outline the methods that were used to explore the research questions driving this investigation.

Chapter 3: Method outline

In this chapter, I outline the methods I used to explore the research questions driving this investigation. Recall that the primary research questions were concerned with the UX Researcher-Designer relationships and asked: (1) are personas and context scenarios perceived as usable, useful and effective translations/conduits of user research by designers; in other words, do they help strengthen the Designer-User relationship by helping the designer keep end users in mind? And (2) what should UX researchers strive to understand about designers to maximize designer understanding of end user goals and needs; in other words, can personas and context scenarios be made more useful and usable? These research questions were studied in part by using personas and context scenarios describing mobile phone users in Kyrgyzstan, who represented a single case of a geographical and culturally 'distant audience'. Developing the personas and context scenarios representing a distant audience investigated the UX Researcher-User relationship while exploring my secondary research question: as the audience for technical products expands geographically and towards greater inclusion, what are some method modifications UX researchers may need to consider for researching these new audiences, specifically for creating personas and context scenarios when there is limited access to end user populations? There were three steps involved in this investigation.

The first step, presented in Chapter 4, involved a short screening survey of professionals who are responsible for creating technology products. The screening survey provided a pool of participants whose experience with UX research (including personas and scenarios was known).The survey was administered online; respondents were given the opportunity at the end of the survey to volunteer their contact information for later studies.

The second step, discussed in Appendix A, looked to find answers for the secondary research question which focuses specifically on differences I found in (a) methods for creating personas and context scenarios as described by the dominant

(popular) literature; and (b) how methods were modified due to differences enforced by creating personas and context scenarios for one circumstance of a geographically distant audience (i.e. mobile phone users in Kyrgyzstan). Because of limited access to end users, I used data that was not collected with the intent of persona/scenario creation. As such, this step served as a case study which might generalize to other persona/scenario efforts in which there is limited access to end users.

There are two reasons to focus on a geographically distant audience for this dissertation. First, if design teams will increasingly have less innate understanding of users as the audience for technology products/services expands, then it is not only increasingly important for UX researchers to successfully communicate the end user message (e.g. the mock user), but also to develop methods and procedures to effectively investigate distant audiences. Second, by reducing designer familiarity with end users, a distant audience will accentuate whether personas and context scenarios meet their claims as effective mock users. This is because in the void of extensive existing knowledge about end users, designers will only have UX research to guide their understanding.

Finally, the third step, which represented the major portion of the study, searched for answers to the two primary research questions. This step involved recruiting designers from the screening survey who volunteered their contact information. Ten of these designers participated in an exploratory design study in which the participants were asked to outline an interaction flow for a proposed text-based mobile phone application.[12] The designers were given the personas and context scenarios created in step two (see Appendix A) as part of the background materials. The remaining screening survey respondents were sent a follow-up survey *if* they indicated previous experience with personas and/or scenarios.[13] Both survey

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12 The proposed text-based mobile phone application, based on research in Kyrgyzstan, is discussed in greater detail in Appendix A.

13 The screening survey did not specify 'context scenarios' since this is not a term widely used in the HCI field. My discussion of the findings reflects on this in greater detail.

respondents who had used UX research and those who had created/conducted UX research were sent follow-up surveys; however, the surveys were slightly modified so the questions were oriented towards the respondent's previous experience (i.e. user versus creator/conductor).

Both the design study and follow-up surveys investigated several moderator variables that could potentially influence persona (with context scenarios) effectiveness as summarizations and communication conduits of end users. These moderator variables were derived from rhetorical theory, design cognition research and the literature discussing personas and context scenarios. Interrelationships among the moderator variables were explored as well as relationships to the outcomes; i.e., dependent variables, of using personas (with context scenarios). Both moderator and dependent variables are detailed in the next sections.

3.1: Moderator variables

In this section, I outline the moderator variables I investigated for the primary research questions driving this investigation; these variables were chosen because I felt they may influence how designers use personas and scenarios. The moderator variables are categorized as follows: (a) designer profile variables (section 3.1.1); (b) designer mind variables (section 3.1.2); (c) design expertise (section 3.1.3); (d) HCD orientation (section 3.1.4); (e) perception related variables (section 3.1.5); and (f) exogenous variables (section 3.1.6).

3.1.1: Designer profile variables

Designer profile variables are factors that help define designers. I have categorized these variables as personal profile (section 3.1.1.1) and professional profile variables (section 3.1.1.2).

3.1.1.1: Personal profile

Personal profile variables were established for other possible interactions with persona/context scenario use. These variables included age and gender. These variables were established in the screening survey and discussed in Chapter 4.

3.1.1.2: Professional profile

Professional profile variables include job title and professional experience. Several studies have found that more experienced designers have greater functional access to information from the problem space. It is suggested that design experts have access to more information because they can chunk greater amounts of data by focusing on underlying principles instead of surface feature problems (Cross, 2004). Again, since personas (with context scenarios) represent information from the problem space, I explored if there was an association between designer experience and how they engaged with the research materials. I established professional profile variables in the screening survey discussed in Chapter 4.

3.1.2: Designer mind variables

Designer mind variables are moderator variables determined by the designer. This category includes empathy (section 3.1.2.1) and design cognition strategy (section 3.1.2.2).

3.1.2.1: Variance in designer empathy

Webster's dictionary defines empathy as "the projection of one's own personality into the personality of another in order to understand him better; ability to share in another's emotions or feelings"(Guralinik, 1976). Historically in the field of psychology, empathy has been characterized by two broad categories of responses. The first is an intellectual response, i.e., the ability to understand the perspective of another. The second is a visceral response, i.e., the ability to feel the perspective of another at an emotional level (Davis, 1983). This dual aspect of empathy has led to multidimensional approaches in attempts to better measure empathetic capacity.

I used the 'Interpersonal Reactivity Index' (IRI) to assign an empathy profile to design study participants and survey respondents. The IRI is a 28-item self-report measure of empathy created by Mark Davis (1980) that uses a multidimensional approach to explore designer empathy in this dissertation research. Davis (1983) contends that the IRI measures four separate aspects of empathy: (1) perspective-taking; (2) fantasy; (3) empathetic concern; and (4) personal distress. The dimensional structure of the IRI has been validated in other studies and it correlates with other measures for empathy (Davis, 1983; Mar, Oatley, Hirsh, Paz, & Peterson, 2006; Oatley, 2008). Each measure is described in more detail below from the most intellectual response to the most emotional.

The perspective taking measure is considered the most intellectual response of the four measures. It evaluates the tendency to adopt the psychological viewpoint of another. Previous research has indicated that it is strongly positively correlated with social functioning and self-esteem, but not associated with any measures of intelligence (Davis, 1983).

Fantasy, considered a mild emotional response, describes tendencies to transport oneself imaginatively into the feelings of fictitious characters from books, movies and plays. Men generally score higher in the fantasy measure. Fantasy is also mildly positively associated with higher intelligence as measured by verbal scores, and some social dysfunction measures, including shyness and anxiety (Davis, 1983).

Empathetic concern, considered an emotional response, gauges levels of sympathy and concern for another in an unfortunate situation. Empathetic concern has been shown to be positively correlated with shyness and anxiety and other measures indicating a non-selfish concern for others (Davis, 1983). However, there was no association with intelligence.

Finally, personal distress, the most emotional response, appraises feelings of personal anxiety and unease in response to a tense situation involving other people. A higher score in this measure is strongly associated with lower self-esteem and

increased shyness and social anxiety (Davis, 1983). Again, the measures were not correlated to intelligence.

It is a common stereotype that designers are empathetic individuals. The ability to 'make something make sense' to someone else requires the capacity to understand the perspective of another (A. Cooper, et al., 2007). However, there is no discussion in the literature about how an individual designer's empathetic profile might be related to the ability to utilize UX research, or more specifically, personas and context scenarios. This is an important consideration because individuals vary in their empathetic capacities (Mar, et al., 2006) and a primary claim of personas is that they facilitate designer empathy with end users. Participants in the design study and respondents in the follow-up study were asked to complete an online version of the IRI. The IRI results are discussed in Chapter 6.

3.1.2.2: Design cognition strategies.

The cognition strategy variable was derived from design cognition research. Recall that in the Kruger and Cross (2006) study, findings indicated that while all designers were solution-driven problem solvers there was variation in designer strategies. In one variation, designers used more problem-driven strategies which resulted in designers placing emphasis on defining the problem. The researchers also identified a sub-variant of the problem-driven strategy they labeled as 'information-driven' where designers focused on gathering information from external sources.

In the opposing cognition strategy, designers placed emphasis on finding solutions quickly. These designers gathered the minimum amount of data required to move forward with a solution. In the sub-variant of the solution-driven strategy, 'knowledge-driven design', the designer used prior, structured, knowledge to help build the solution and only uses a minimal amount of external information.

Since personas and scenarios represent information from the problem space, I hypothesized that cognition strategy would be related to how personas (and context

scenarios) would be used; as such, I asked designers to identify their own strategy. Findings are discussed in Chapter 6.

3.1.3: Design expertise

Domain and object expertise also have potential to affect a designer's ability to utilize personas and scenarios. Recall that Adelson and Soloway (1985) found that domain/object familiarity will influence: (1) the ability to form a working mental model complex enough to support global simulation is only seen when the domain is familiar and indicates a breadth-first approach; (2) the ability and need to perform global simulation (breath-first approach) which involves testing candidate solutions while concurrently considering how various design components are interacting with each other, is only seen when the domain is familiar and the object is unfamiliar; (3) note-making, which is only seen in relation to global simulation; (4) whether designers will represent their own constraints to help frame the solution (establishing the needs of the system) which occurs with the domain is unfamiliar[14]; and (5) systematic expansion which is demonstrated by considering design components at levels of abstraction that is consistent for all components of a design. Since the exploratory design study conducted for this dissertation was not a within subjects study design, I did not intend to replicate Adelson and Soloway's work; however, I did attempt to understand the interaction of domain, object and audience familiarity with persona (with context scenario) use.

Adelson and Soloway (1985) defined an object's domain as the "general classification of the system according to its use." Since participants were recruited based on familiarity with the object domain (electronic interaction design) the level of domain familiarity was assumed to correlate to their level of professional experience in their current field. However, participant designers in the exploratory design study were expected to have a range of familiarity with the object (mobile phone text-based

[14] When the object is also unfamiliar fewer constraints are established.

application), and the audience (mobile users from Kyrgyzstan). I established object and audience domain expertise of the design study participants and used the Adelson and Soloway framework to reflect on the participant behavior. These findings are discussed in Chapters 6 and 7.

3.1.4: HCD orientation.

HCD orientation in this investigation had two aspects: (1) experience with personas and/or scenarios (section 3.1.4.1); and (2) alignment to HCD principles as defined by Gould and Lewis (section 3.1.4.2).

3.1.4.1: Experience with personas and scenarios.

Research has indicated that designers who have had experience using personas and other HCD methods might be better equipped to incorporate them into their thinking (Blomquist & Arvola, 2002). However, a negative past experience may have the opposite impact. To explore the effect of experience with personas (and context scenarios) I established the number of projects in which participants had used personas and/or scenarios. These findings are presented in Chapter 6. To establish past experience attitudes I asked an open ended question about experiences with UX research in general and persona (and context scenario) experience specifically in the follow-up surveys and the design study. These findings are presented in Chapter 8.

3.1.4.2: Alignment to HCD principles

To establish alignment to HCD principles I asked the same question in the screening survey as Gould and Lewis (1985) used in their survey. These findings are discussed in Chapter 4.

3.1.5: Perception related variables

Rhetorical theory indicates that personas (with context scenarios) not only need to be decoded effectively by the designer audience (i.e. be understandable), but that the designer audience must be persuaded to take on the role of the mock designer.

However, it is unclear what factors will make personas (and context scenarios) more understandable and/or more persuasive artifacts. I identified two categories of perception-related types of variables: (1) research related which included perceptions about the education and background of the UX research team, sample size, research methods and the presentation modes (section 3.1.5.1); and (2) perception about the effects of using personas and context scenarios that represent a distant audience (section 3.1.5.2). Findings about perception related variables are discussed in Chapter 7, 8 and 9.

3.1.5.1: Research related perception variables

I initially identified five possible research related perception variables. Findings are explored in depth in Chapter nine. Each variable is discussed in the next five sections (3.1.5.1a-e).

3.1.5.1a: Education and background of the UX research team. I investigated whether the level of trust in the source of the personas (and context scenarios) affected designer perception of their persuasiveness as UX research conduits. Did they care about the background of the researcher(s)? This included designer perception of different types of experience and educational backgrounds. Questions regarding the education and background of the research team were asked in the exploratory design study and the follow-up survey.

3.1.5.1b: Sample size. Mulder and Yaar (2007) reported that many organizations they worked with would not trust the validity of personas if they felt too few users were consulted. In qualitative work[15], tenable sample sizes are always difficult to estimate, obviously, the more participants, the more power to find relevant findings. However, sample size is always balanced with time/cost, and a small samples may yield many important findings. In usability testing, for example, it is estimated

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[15] The rule of the thumb in quantitative work is an N:P ratio of approximately 15:1 for most multivariate analysis, where N = the sample size and P = the number of variables. However, ratios as high as 20:1 are suggested for conducting factor analysis such as PCA or EFAs (Tabachnick & Fidell, 2007).

that as few as three to five participants will find 80% of the system problems (Barnum, 2002). In this investigation, I explored how designers felt about sample size in the exploratory design study and in the follow-up survey. First, I asked, did they care about sample size, and second, if they expressed concern, then how many users they believed should be consulted?

3.1.5.1c: Research methods. Perceived difference between quantitative and qualitative methods is an especially interesting question area since other research has found that quantitative data is a key to increasing persona credibility (Khalayli, Terum, Nyhus, & Hamnes, 2007; Mulder & Yaar, 2007). It is believed that how designers perceive method rigor may affect the persuasive quality of personas and scenarios; however, little is known about designer perception in this regard. Chapman and Milham (2006) argue that without using quantitative methods (with large sample sizes) it is not possible to predict how many people one persona represents. Personas, therefore, are not believable artifacts. I investigated whether this perception was shared by designers in the exploratory design study and the follow-up survey.

3.1.5.1d: Presentation methods. While Pruitt and Grudin (2003) believe that designers need a 'foundation document' that explicitly ties the persona to the real user data, Cooper et.al (2007) advocate laminated quick reference sheets. Other researchers have experimented with different types of tchotchkes including action figures and beer glasses. Whatever the presentation mode, if it helps create more memorable and persuasive personas, then the mode has value.

Context scenario presentation was also investigated. I also asked about designer perceptions in regard to the context scenario presentation in the exploratory design study, for example text narratives versus visual storyboards.

3.1.5.2: Distant audience effect

This factor is related to domain expertise and if designers perceive audience as a domain expertise area. In other words, do designers perceive a difference interacting with research materials that represent mobile users in Kyrgyzstan versus an audience

they are likely to be familiar with, for example, office workers in Seattle? As part of the exploratory design study and the follow-up survey, designers were asked to reflect on differences they felt existed between using personas/scenarios representing the Kyrgyz audience (where unfamiliarity is assumed –geographical/cultural) and for office workers in Seattle (where familiarity is assumed). They were also asked to reflect on the same question comparing teens with autism (psychological distance assumed) versus office workers in Seattle.

3.1.6: Exogenous variables

Exogenous variables describe factors that are part of designer experience that are introduced by exterior forces. There are two of these types of variables discussed in the persona literature: (1) timelines/budgets, for example, if the project is on a fast timeline or has a minimal budget the design team may not have the opportunity to engage personas (Pruitt & Adlin, 2006); and (2) organizational support for the concept of personas at the top levels of a company to assure persona effectiveness (Mulder & Yaar, 2007). For example, if an organization perceives little value in personas then the design team will be less likely to adopt the mock user represented by the personas. Any mention of exogenous variables was explored in the analysis of open-ended questions in both the exploratory design study and the follow-up surveys. Additionally, survey respondents were asked to rate the level of organizational support in their last persona experience. Findings about exogenous variables are presented in Chapter 8.

3.2: Dependent Variables

Dependent variables (i.e. outcomes) of persona (with context scenario) was measured in four ways: (1) how aligned the mock user created by the designer is to the persona and context scenario documents (section 3.2.1); (2) if they met their beneficial claims (section 3.2.2); (3) if they avoided their criticisms and concerns found in the literature (section 3.2.3); and (4) the level of perceived success by designers (section

3.2.4). Information about outcomes was gathered through observation, explicitly asked and implicitly inferred from discussion.

3.2.1: Mock user definition

The generalized goal of using personas and context scenarios is to help designers create an actionable mock user(s). I differentiated this from the claim of focus because a mock user definition is not concerned with alignment to UX research. While a mock user that is misaligned to research data is less than desirable (i.e. lack of focus), using Gibson's (1950) framework, simply narrowing the end user audience will facilitate a consistent interface that will provide the clues for end users to adopt the role of the mock user.

3.2.2: Beneficial claims

The literature describes the benefits of using personas as: (1) clearer focus; (2) increased communication; (3) greater empathy for end users; and (4) avoidance of ill-informed assumptions and stereotypes. Adding context scenarios to personas, advocates argued, had the potential to communicate cultural differences. Claims are explored (a) through observation in the exploratory design study (presented in Chapter 7); (b) by coding for unsolicited mention in answers and discussion (see Chapters 7, and 8); and (c) through questions that explicitly asked about each claim (see Chapter 10).

3.2.3: Criticisms and concerns

Criticisms of personas claim that the method: (a) leads to stereotype confirmation (i.e. personas are empty receptacles in which designers fill with their own assumptions if the research materials do not align to the designers preconceived ideas); (b) requires designers to have training in persona/scenario use before they have the capacity to reap the benefits and avoid the criticisms (this is directly related to the independent HCD orientation variable of persona and scenario experience); (c) results in stale and ineffective UX research and overuse; (d) abstracts users so that designers

are not forced to think about all the human complexities of the audience; (e) requires the special skills of a social scientist for creation making them expensive and time consuming to produce; and (f) are not believable due to insufficient data or unclear relationships to the research data. The primary concern of context scenarios is that they need personas (lead characters) to maximize their utility.

Stereotype avoidance was coded for in observation and discussion in the exploratory design study presented in Chapter 7. All other criticisms and concerns were identified if I found unsolicited mention in discussions and answers. These findings are presented in Chapters 7, 8 and 10.

3.2.4: Perceived success

Perceived success was another outcome I identified. In the follow-up survey respondents were asked explicitly to rate the success of personas the last time they were used. Findings are presented in Chapter 8. Perceived success is also inferred from participant discussion about past experiences in the exploratory design study and presented in Chapter 8.

3.3: Summary: Moderator and dependent variables

The moderator variables described in this chapter were chosen based on their possible effect on designer ability and proclivity to utilize personas and scenarios. Both rhetorical and design cognition theory informed the choice of many of these variables. See Table 2 for a complete list of moderator variables. Additionally, I detail in the table which study the variables were explored. Throughout this dissertation, I examined interrelationships among the moderator variables and the dependent variables described above.

Dependent variables describe both the potential benefits and potential problems of using personas (with context scenarios). Outcomes that I identified included the mock user alignment, claims and criticisms of the methods found in the literature and the perceived success of the method in the last experience. See Figure 3, for how the

dependent (outcome) variables were explored and a graphical representation of all the variables explored in this study.

Table 2: Moderator variables

Moderator variables	Screening survey	Follow-up survey	Design study
Designer profile			
Designer age	Yes		
Designer gender	Yes		
Designer job title	Yes		
Professional experience/job experience	Yes	Yes	Yes
Designer mind			
Design cognition strategy		Yes	Yes
Designer empathy		Yes	Yes
Expertise : Object/Domain/Audience		Yes	Yes
Object (mobile phone text-based application)			Yes
Domain (electronic interaction design)			Yes
Audience domain (Kyrgyzstan)			Yes
HCD orientation			
Experience with personas/scenarios and UX research	Yes	Yes	Yes
Alignment to HCD principles	Yes		
Exogenous : Timelines/budget and Organizational support		Yes	Yes
Perception related variables			
Perception of the education and background of the research team		Yes	Yes
Perception of sample size		Yes	Yes
Perception of research methods		Yes	Yes
Perception of presentation methods		Yes	Yes
Perception of distant audience effect		Yes	Yes

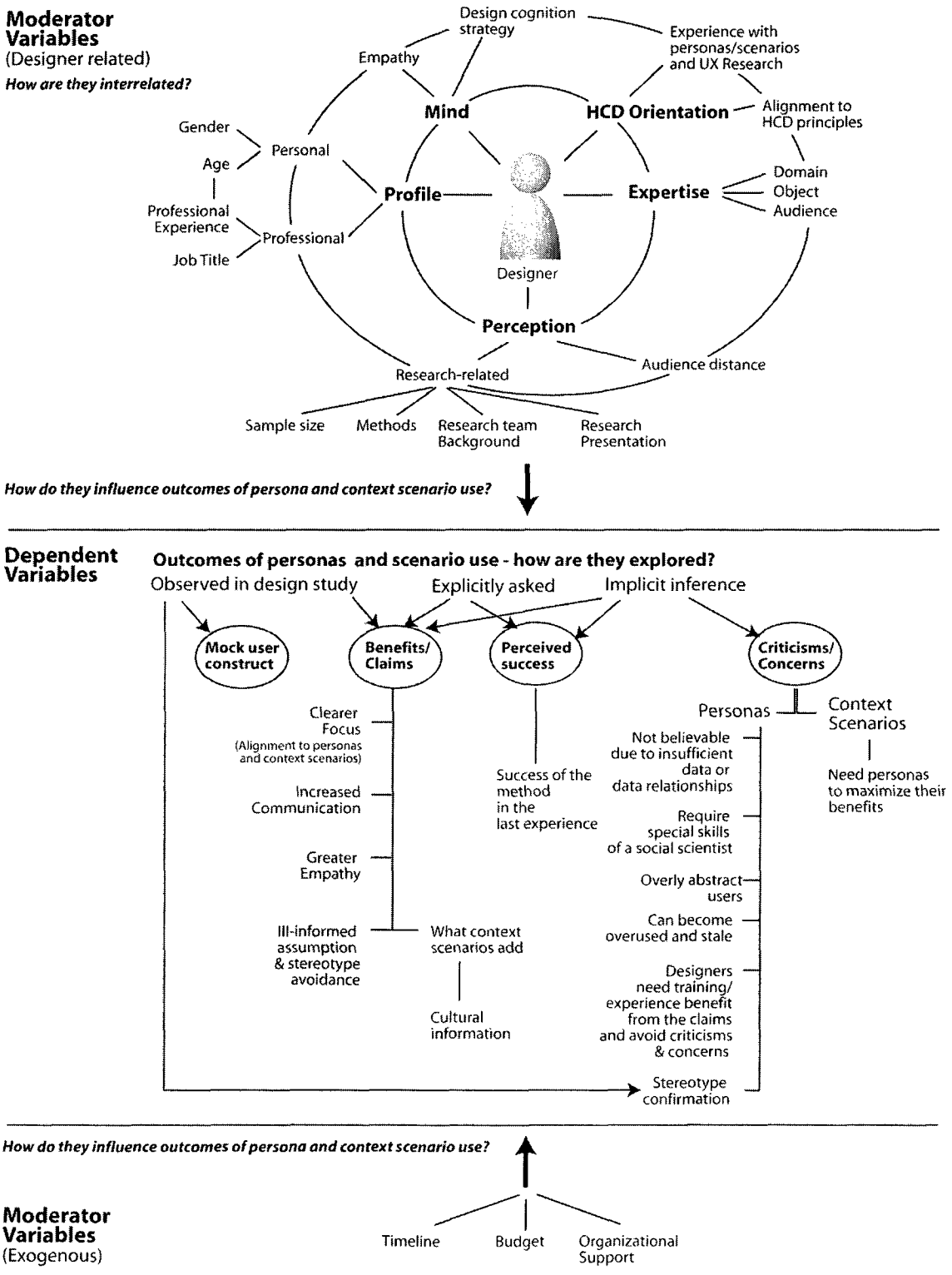


Figure 3: Moderator and dependent variables

Chapter 4: Participant screening survey

The results of the online screening survey provided a pool of possible designer participants for the later studies (exploratory design study and follow-up surveys) in which some of the potential influential variables were explored. The survey established personal profile (age and gender), professional profile (experience and job title) and HCD orientation. Since the recruitment text for the survey did not specify designers, I also received responses from professionals other than designers. These job titles included UX Centric positions (UX Researchers, Usability Specialists, UX Architects), and Management positions (Project Managers and Program managers). I analyzed their responses in parallel with those with Designer job titles[16] (Designers, Interaction Designers, Information Architects, Writers, and Developers) which provided a means of comparison among the job title types that use personas and scenarios. I discuss the methods (section 4.1) and results (section 4.2) for the screening survey in the next sections, followed by a discussion (section 4.3), and a brief outline of the next steps for the exploratory design study (section 4.4).

4.1: Methods

This methods section is organized as follows: (section 4.1.1) survey participants; (section 4.1.2) survey design; (section 4.1.3) variables; and (section 4.1.4) data analysis procedures.

4.1.1: Participants

The survey received a total of 213 responses in the ten weeks it was available online between December 6, 2008 and February 15, 2009. Respondents

[16] Note, the segmentation by job titles into groups (UX Centric, Designer, Manager) was based on analysis to an open-ended question which asked respondents to describe their job responsibilities. This is discussed in more depth in section 4.2.3.

were recruited through 'snowball' sampling from three sources. First, a local agency, Filter Talent, who specializes in "creative staffing for interactive media and production," displayed a link to the survey on their website. Second, I advertised the survey on Craig's list under the topic "computer gigs" on two occasions, once in the second week of the survey deployment (December 10, 2008) and once in the ninth week of the survey deployment (February 4, 2009). Finally, I asked people I knew personally from my past job experiences as an interactive/visual designer to distribute the survey link to appropriate potential respondents.

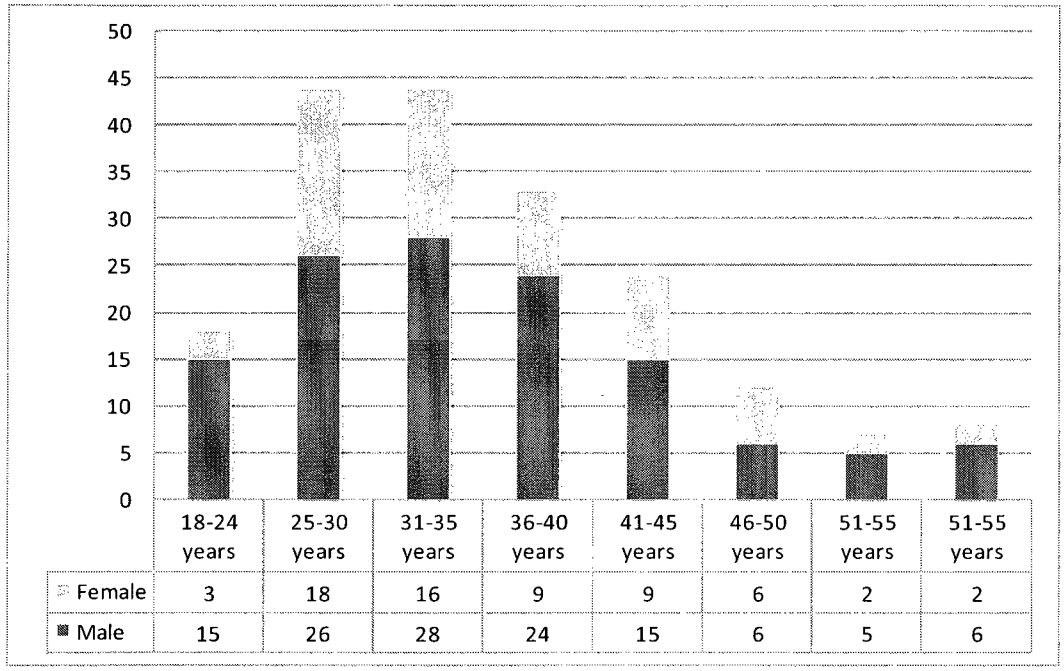
In the recruitment text respondents were told that: (a) the survey would take about five minutes to complete; and (b) the first 100 respondents who *completed* the survey would receive an Amazon.com gift certificate worth $5.00. This information was also repeated on the introduction page of the survey; see Appendix B for the entire screening survey. Additionally, the introductory survey text informed respondents that submitting contact information was not a requirement for survey completion; however, respondents were asked to leave their contact information at the end of the survey to receive gratuity or for contact if they had agreed to participate in later studies. In truth, to encourage involvement in the later studies, I compensated all respondents who completed the survey, were in the first 100 responses, and/or had agreed to further studies. In total, 174 respondents were sent the $5.00 gratuity.

Of the original 213 responses, 23 were deemed not usable and therefore deleted. Reasons for deletion included:

- Twenty responders did not leave any data except, in a few cases, their age
- One respondent answered 'no' to the first question of the survey which asked respondents if they were in a professional involved in the creation or evaluation of software technology, consequently, the respondent was branched to the end of the survey

- One respondent completed the survey twice, but answered differently, so both entries were deleted
- One responder reported their job title as a User Researcher but did not report ever being exposed to user research.

Of the remaining 190 respondents, the median age bracket was tied between 25-30 years and 31-35 years, with most (73%) age 40 or younger. Most respondents (66%) were male, see Figure 4.



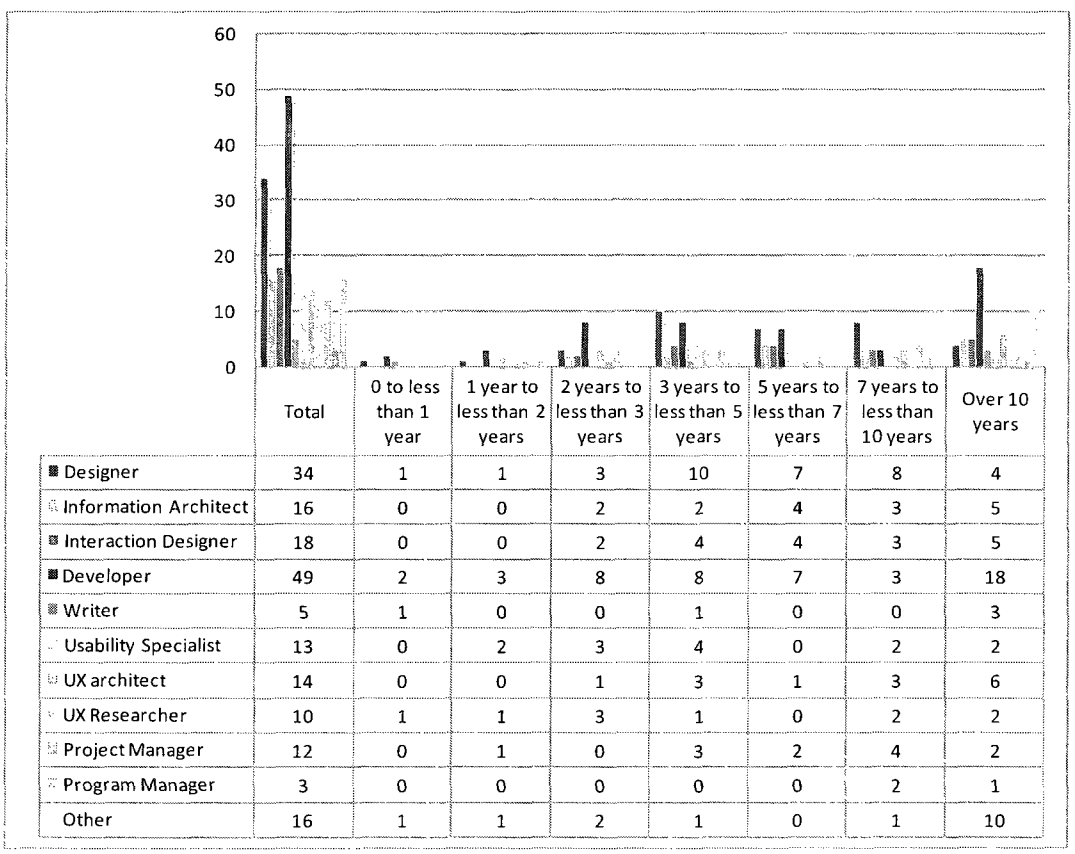
	18-24 years	25-30 years	31-35 years	36-40 years	41-45 years	46-50 years	51-55 years	51-55 years
Female	3	18	16	9	9	6	2	2
Male	15	26	28	24	15	6	5	6

Figure 4: Age and Gender of Respondents

Most of the respondents identified their job titles as Developers (26%) and Designers (18%), see Figure 5. Sixteen responders reported 'other' job titles which included: (a) combination jobs (five respondents), for example, "designer and developer," or "I have done all of these"; (b) analysts (four respondents), for example, "web analyst" and "business analyst"; (c) other management (three respondents), for example "design manager" and "manager for usability"; and (d) those that did not fit into any grouping (five respondents), for example, "education" and "QA Engineer." Since it was difficult to assess and categorize job

responsibilities from such a disparate group of job titles, these sixteen respondents were deleted from much of the analysis.

The most common experience bracket (mode) for respondents to report was over ten years (30%) followed by three to five years (19%), see Figure 4. The median experience bracket was five to seven years. Respondents were also asked how many years they had with the specific job title; the results (not surprisingly) were highly positively correlated with overall experience (Pearson's $r = .81$, $p < .001$). The high correlation suggested that the questions were measuring the same variable (i.e. experience); consequently, I only used professional experience (not specific job experience) in subsequent analysis.



	Total	0 to less than 1 year	1 year to less than 2 years	2 years to less than 3 years	3 years to less than 5 years	5 years to less than 7 years	7 years to less than 10 years	Over 10 years
Designer	34	1	1	3	10	7	8	4
Information Architect	16	0	0	2	2	4	3	5
Interaction Designer	18	0	0	2	4	4	3	5
Developer	49	2	3	8	8	7	3	18
Writer	5	1	0	0	1	0	0	3
Usability Specialist	13	0	2	3	4	0	2	2
UX architect	14	0	0	1	3	1	3	6
UX Researcher	10	1	1	3	1	0	2	2
Project Manager	12	0	1	0	3	2	4	2
Program Manager	3	0	0	0	0	0	2	1
Other	16	1	1	2	1	0	1	10

Figure 5: Job Title by Experience

4.1.2: Survey design

The survey was created using the University of Washington's Catalyst survey tool, see Appendix B. Respondents first had to agree that they were at least 18 years of age and were "professionally involved in the creation or evaluation of software technology" to be able to navigate beyond the first page. The remainder of the survey was split into three parts described in the next sections.

4.1.2.1: Part One

All respondents were asked the same five questions in part one. Respondents were asked: (1) to report their job experience in years; (2) to identify their job title; (3) to estimated the number of years at job title; (4) an open-ended question about job responsibilities; and (5) an open-ended question asking them to "*Please describe approximately three to five major steps you consider good practice for designing, developing and evaluating a new computer system for users*." This wording was identical to the Gould and Lewis (1985) query.

4.1.2.2: Part two

Following the first five questions, respondents were asked, "*Have you ever utilized (been given user research, for example, a description of a user) or conducted user research (done the research yourself) while part of a team creating software technology?*" The possible answers included: (1) no; (2) yes, I have utilized user research; (3) yes, I have conducted user research; or (4) yes, I have both conducted and utilized user research. The survey then employed a branching strategy based on how the respondent answered this question.

If respondents answered 'no' they were branched to part three. If they answered 'yes', they were asked two additional questions which were worded appropriately as to whether they identified themselves as a 'user' or as a 'conductor/creator' or as a 'user + conductor/creator' of UX research. First, respondents were asked what user research methods they had used, in which they

could choose up to nine methods, including personas and scenarios[17], and an option to write in 'other'. Since I was primarily interested in persona and scenario exposure, the other research methods were presented primarily as foils. Second, respondents were asked an open-ended question to describe their last experience with user research.

4.1.2.3: Part three

In part three, respondents were asked their age, gender and if they would be willing to be contacted for further studies. I briefly described the two further studies (exploratory design study and follow-up surveys), including the gratuity and predicted schedule for each study. Respondents were given four options: (1) no, thanks; (2) yes, for the follow-up survey only; (3) yes, for the design study only; and (4) yes, for either study. The participants were then asked to leave their email for the $5.00 Amazon gift gratuity and/or for contact to participate in further studies.

4.1.3: Variables explored

The screening survey established some of the designer profile and experience moderator variables discussed in Chapter 3. Variables included: (1) designer age; (2) designer gender; (3) level of professional experience; and (4) job title. Additionally, a measure for HCD orientation was established by analyzing: (a) responses to the Guild and Lewis probe; and (b) how respondents included end users in their responses to the open ended probes (job descriptions, Gould and Lewis query, and last UX research experience).

Three outcomes were explored through logistic regression. First, I identified if designer profile variables (age, gender, job title, and professional experience) could predict exposure to UX research (any method including personas and

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[17] I did not specify 'context scenarios' since this is not a common term in industry. As such, it is not clear what respondents had in mind when answering for scenario experience.

scenarios). Second, the model was refined to explore if persona and/or scenario exposure could also be predicted by designer profile variables. This was important to establish because previous research had indicated that exposure to personas may have an effect on their utility as a UX research method (Blomquist & Arvola, 2002; Rönkkö, 2005).

4.1.4: Data analysis procedure

The data was analyzed through five questions:

- Was there a predictable profile among those with Designer job titles (age, gender, job title, and professional experience) who had experience with UX research? (Section 4.1.4.1)
- How many respondents reported exposure to personas/scenarios and was there any relationship between persona/scenario exposure and designer profile variables? (Section 4.1.4.2)
- How did respondents describe their job responsibilities in the open-ended question and how did they include end users in their descriptions? (Section 4.1.4.3)
- How did respondents answer the Gould and Lewis (1985) query and how did they include end users in their descriptions? (Section 4.1.4.4)
- How did respondents describe their last experience with user research and how did they include end users in their descriptions? (Section 4.1.4.5)

The first two questions resulted in an understanding of who was likely to have UX research experience, while the last three contributed to establishing HCD orientation.

4.1.4.1: Question one: UX research exposure

A direct logistic regression was performed using SPSS to determine if UX exposure could be predicted by designer profile variables. In the survey, respondents were asked, "*Have you ever utilized (been given user research, for example, a description of a user) or conducted user research (done the research yourself) while part of a team creating software technology?*" The results were coded as a vector in which zero represented 'no' and one represented any of the possible 'yes' answers. The model included four predictor variables: age, gender, job title and their number years of professional experience.[18] The job title variable was re-coded to create binary vectors, one for each of the designer job titles.

4.1.4.2: Question two: Personas exposure

Using the same model described above, I investigated if persona and scenario exposure could also be predicted by designer profile variables.

4.1.4.3: Question three: Job Responsibilities

The next sections (4.1.4.3a-b) describe coding the data and analyzing the data for job responsibilities.

4.1.4.3a: Coding the data. The usable responses ($N = 135$) were analyzed and coded using Atlas ti software. Responses were coded for several common keywords or phrases that described an aspect of respondent's job responsibilities.

4.1.4.3b: Analyzing the data. Once responses were coded, I identified: (1) major categories of responsibilities; (2) how responders in each job title described their responsibilities in terms of major categories; and (3) how they described who benefited from their work, i.e., their company, a client or stakeholder, or an end user. End user was determined by coding for the mention of 'user', and 'customer' or 'consumer'. The results of this analysis provided justification for the

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[18] Note, that while age and professional experience were technically asked as ordinal variables (age, ranging from 1 to 8, and experience, ranging from 1 to seven) they were entered into the model as continuous data.

segmentation of respondents into different job title categories (Designer, UX Centric, and Management).

4.1.4.4: Question four: Gould and Lewis (1985) query

The next sections (4.1.4.4a-b) describe coding the data and analyzing the data for job responsibilities.

4.1.4.4a: Coding the data. Recall that Gould and Lewis asked their study participants to describe "*Three to five major steps you consider good practice for designing, developing and evaluating a new computer system for users.*" Responses to this query from the screening survey were first analyzed and coded using Atlas ti software. Utilizing a very liberal scoring method (recommended by Gould and Lewis), each response was coded for: (a) an early focus on users; (b) empirical testing with users; and (c) iterating design based on user input. Since this analysis (a) required inference on my part and (b) I was going to later use the information for statistical analysis, I also performed an inter-rater reliability check. Reliability was performed by a Masters student from the department of Human Centered Design & Engineering at the University of Washington. The student independently coded the same set of data. Answers from this query were also keyword coded to determine how end users were discussed in the responses.

4.1.4.4b: Analyzing the data. Each respondent was assigned a score based on the number of principles they mentioned in their response which were labeled 'GL scores' ranging from 0-3. Responses were also analyzed for end user consideration using the same set of keywords described in question three analyses.

Isolating respondents with Designer job titles, I probed for associations among profile variables (age, gender, professional experience and job title), UX research exposure, GL score, and inclusion of the term 'user' through univariate statistics. I also compared GL scores and inclusion of the term 'user' among Designer job titles ($N = 122$, Designer, Interaction Designer, Information Architect, Developer, Writer), UX Centric job titles ($N = 37$, Usability Specialist, UX

Architect, UX Researcher) and Management job titles (N = 15, Project Manager and Program Manager).

4.1.4.5: Question five: Last experience with UX research

The next sections (4.1.4.5a-b) describe coding the data and analyzing the data for last experiences using UX research.

4.1.4.5a: Coding the data. The usable responses (N = 109) were analyzed and coded using software from Atlas ti. Responses were coded for four constructs: (1) HCD methods mentioned; (2) end user consideration using the same set of keywords described in question three analyses; (3) what role (user, creator/conductor, or user + creator/conductor) did the respondent perform in their last UX research experience; and (4) reported success of the last UX research experience. I again performed an inter-rater reliability check, since ascertaining the role required inference on my part and I used the data for statistical analysis. Reliability was performed by a Masters student from the department of Human Centered Design & Engineering at the University of Washington who independently coded the same set of data.

4.1.4.5b: Analyzing the data. I first isolated respondents with Designer job titles and then investigated associations among profile variables (age, gender, professional experience and job title) and the outcome for each construct through univariate statistics. I also compared outcomes for each construct among the three job title types, Designer, UX Centric and Management.

4.2: Results

In the results section, I detail findings from the analysis of the five questions described in the data analysis procedures. The findings are organized as follows: logistic regression model for predicting exposure to UX research (section 4.2.1); logistic regression model for predicting exposure to personas and scenarios (section 4.2.2); job descriptions (section 4.2.3); Gould and Lewis (1985) query

(section 4.2.4); and descriptions of the last experience with UX research (section 4.2.5).

4.2.1: Associations among respondent profile and UX research exposure

In this analysis I asked, if there was a predictable profile among those with Designer job titles (age, gender, job title, and professional experience) who had experience with UX research? This was important to establish because previous research had indicated that exposure to personas may have an effect on their utility as a UX research method (Blomquist & Arvola, 2002; Rönkkö, 2005).

Most responders from all job titles (83%) reported exposure to UX research. Most, 80% of those with Designer job titles reported UX research exposure, see Figure 6. Most responders claimed their role was as a 'user + conductor/creator'. Responses were analyzed to determine if reported exposure to UX research could be predicted by designer profile variables, see Figure 7.

Figure 7: UX exposure by all job titles

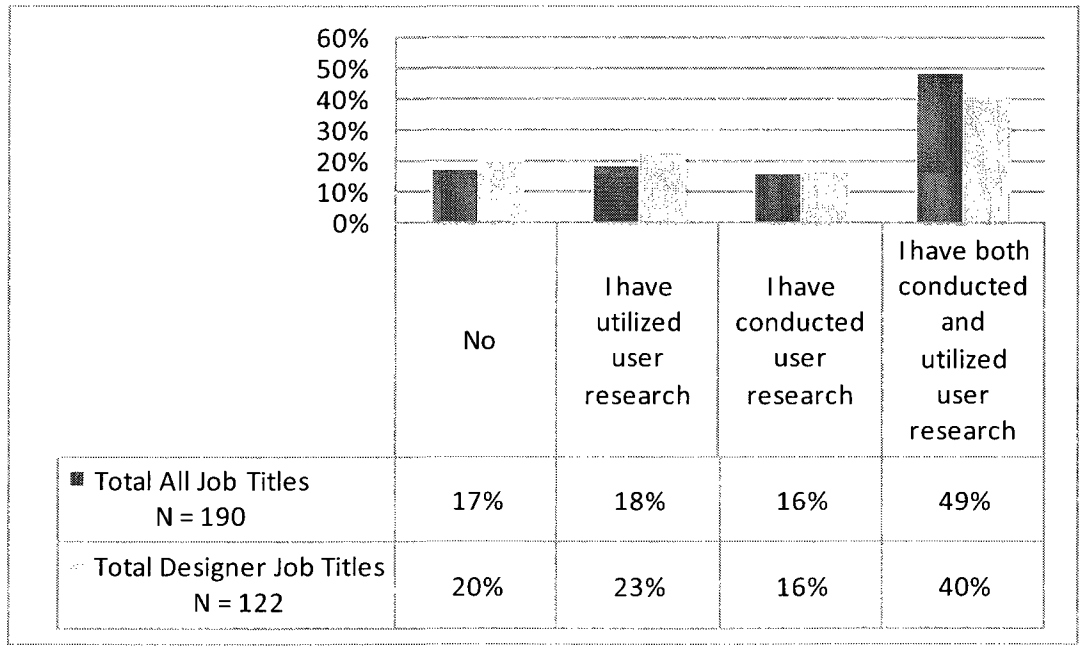
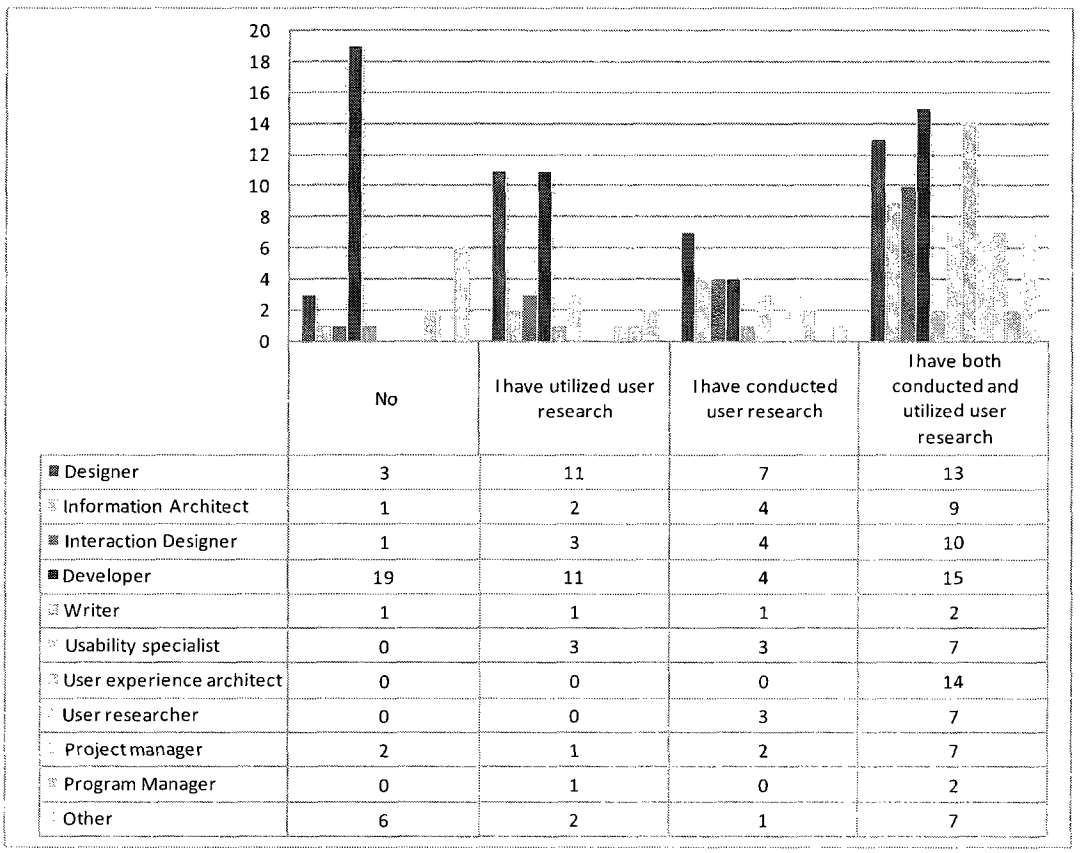


Figure 6: UX research exposure



	No	I have utilized user research	I have conducted user research	I have both conducted and utilized user research
Designer	3	11	7	13
Information Architect	1	2	4	9
Interaction Designer	1	3	4	10
Developer	19	11	4	15
Writer	1	1	1	2
Usability specialist	0	3	3	7
User experience architect	0	0	0	14
User researcher	0	0	3	7
Project manager	2	1	2	7
Program Manager	0	1	0	2
Other	6	2	1	7

Figure 7: UX exposure by all job titles

A direct logistic regression was performed with SPSS using reported UX research (as a binary variable) as the outcome. To determine if those who had been exposed to UX research were different as a group than those who had not, the model examined four predictors, age, gender, job title and their number years of professional experience. Correlations between the model variables are shown in Table 3.

Table 3: Correlations among the model variables

	M	*(Spread)*	*n*	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. UX research exposure	1	[80%]	122	--								
2. Age	3	(1.9)	122	.03	--							
3. Gender	0	[29%]	122	.15 *	.02	--						
4. Professional Experience	5	(1.6)	122	.18 **	.61 **	-.03	--					
5. Job: Designer	0	[28%]	122	.11	-.20 **	-.04	-.07	--				
6. Job: Information Architect	0	[13%]	122	.09	.04	-.06	.07	-.14	--			
7. Job: Interaction Designer	0	[15%]	122	.10	.00	.07	.04	-.15 *	-.10	--		
8. Job: Developer	0	[40%]	122	-.33 **	-.03	-.22 **	-.03	-.28 **	-.18 *	-.19 **	--	
9. Job: Writer	0	[4%]	122	-.01	.10	.23 **	.01	-.08	-.05	-.05	-.10	--

Notes. In the M column modes are reported for dichotomous variables: gender and the job titles which were recoded into vectors. The median bracket is reported for age (Median bracket 3 which = 31-35 years , mean = 3.54) and professional experience (Median bracket 5 which = 5-7 years , mean = 5.04) .Gender was coded 1 female, 0 male. In the Spread column, parenthetical values are Standard Deviations (SD), and bracket values [%] are percentages of respondents coded 1 in the sample.

* $p < .05$, ** $p < .01$

A test of the full model with the set of predictors against the null model with no predictors was significant: $\chi^2(7, N = 122) = 23.73, p < .05$, indicating that the set of predictors reliably distinguishes between individuals who reported exposure to UX research from those who did not, among respondents with Designer job titles. The approximate variance in predicting exposure to UX research accounted for by the set of factors is 28% using Nagelkerke's formula. The classification table shows 32% of respondents who *were not* exposed to UX research were predicted correctly (model specificity), while 96% of respondents who *were* exposed to UX researcher were predicted correctly (model sensitivity), with an overall hit rate of 83% (a slight improvement of the null model's hit rate of 80%), see Table 4.

Table 4: Classification table predicting UX exposure

	Predicted		Percentage Correct
	No	Yes	
No, I have not ever used user research	8	17	32.0%
Yes, I have been exposed to UX research at some level	4	93	95.9%
		Total (Hit rate)	84.8%

The cut value is .500

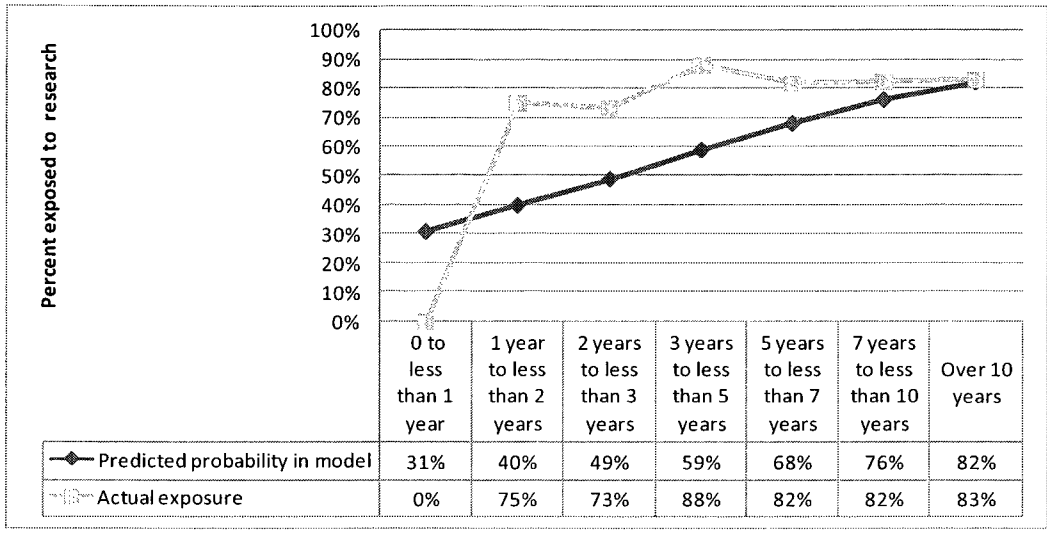
According to the Wald criterion, no single variable reliably predicted UX exposure; however, professional experience is highly positively associated, see Table 5. Writers were dropped from the final model because of the small sample ($N = 5$).

Table 5: Multiple logistic regression predicting UX exposure

	χ^2	*Nagelkerke* R^2	*b*	*(SE)*	*Wald(1)*	*exp(b)*	*95% CI*	
Model	*23.73(7)**	*.28*						
Intercept			-0.79	(1.56)	0.25	0.46		
Age			-0.14	(0.18)	0.58	0.87	*0.61*	*1.24*
Gender			0.91	(0.74)	1.50	2.48	*0.58*	*10.55*
Professional_Experience			0.39	(0.20)	3.81	1.48	*1.00*	*2.18*
Job_Designer			1.54	(1.48)	1.10	4.69	*0.26*	*84.57*
Job_InformationArchitect			1.78	(1.69)	1.12	5.95	*0.22*	*162.24*
Job_InteractionDesigner			1.81	(1.66)	1.19	6.12	*0.24*	*158.58*
Job_Developer			-0.32	(1.37)	0.05	0.73	*0.05*	*10.77*

* $p < .05$

The number of years of professional experience was highly positively associated with UX research exposure, $b = .39$, $SE = .20$, Wald (1) = 3.81, $p = .051$, (which was very close to meeting the threshold alpha of $p < .050$). The median bracket of experience reported was 5-7 years ($SD = 1.8$). If respondents reported one bracket above the median (7-10 years of experience), then they had an approximately 7.8% greater probability of UX research exposure. Reporting one experience bracket under the median (3-5 years) resulted in 9.0% decreased probability, holding all other variables constant at their median/mode. See Figure 8 for predicted probabilities and actual UX exposure by professional experience for those reporting a Designer job title.



	0 to less than 1 year	1 year to less than 2 years	2 years to less than 3 years	3 years to less than 5 years	5 years to less than 7 years	7 years to less than 10 years	Over 10 years
Predicted probability in model	31%	40%	49%	59%	68%	76%	82%
Actual exposure	0%	75%	73%	88%	82%	82%	83%

Figure 8: UX exposure by professional experience for Designer job titles

While not at a significant level, the coefficients for the remaining variables indicate that age was negatively associated with prediction, meaning the younger the respondent the more likely the model predicted exposure. Females were more likely to report UX research exposure. All job titles, except Developer, were positively associated with UX research exposure.

4.2.2: Persona and scenario exposure

Since I was specifically concerned about personas (used with context scenarios) in this research, I next explored exposure to these methods/communication tools. However, recall that I could not ask survey respondents directly about context scenarios because the term is not well known in industry; as such, respondents could have had many different mental images of how a scenario is defined at this point of the study. About 35% of Designer respondents reported exposure to the persona and/or scenario methods, see Figure 9. Personas and scenarios were among the three most common UX research methods to which Designer respondents claimed exposure; only heuristic evaluation had more exposure (38%).

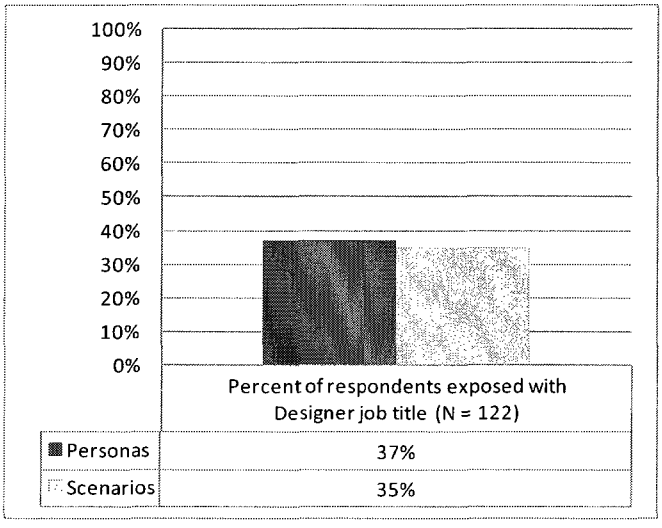


Figure 9: Exposure to personas and scenarios

I performed two direct logistic regressions using SPSS. The first regression was performed with persona exposure as the outcome and the second with scenario exposure as the outcome variable. To determine if those who had been exposed to these methods were different as a group than those who had not, the model examined four profile predictors: age, gender, job title and their number years of professional experience. Correlations between the model variables are shown in Table 6.

Table 6: Correlations among persona and scenario exposure and profile variables

	M	*(Spread)*	*n*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Persona exposure	0	[37%]	122	--									
2. Scenario exposure	0	[35%]	122	.33 **	--								
3. Age	3	(1.9)	122	.08	.18 *	--							
4. Gender	0	[29%]	122	.08	.18 *	.02	--						
5. Professional Experience	5	(1.6)	122	.19 *	.34 **	.61 **	-.03	--					
6. Job: Designer	0	[28%]	122	-.16 *	-.13	-.20 **	-.04	-.07	--				
7. Job: Information Architect	0	[13%]	122	-.03	-.08	.04	-.06	.07	-.14	--			
8. Job: Interaction Designer	0	[15%]	122	.08	.04	.00	.07	.04	-.15 *	-.10	--		
9. Job: Developer	0	[40%]	122	-.10	-.11	-.03	-.22 **	-.03	-.28 **	-.18 *	-.19 **	--	
10. Job: Writer	0	[4%]	122	.06	-.01	.10	.23 **	.01	-.08	-.05	-.05	-.10	--

Notes. In the M column modes are reported for dichotomous variables: gender and the job titles which were recoded into vectors. The median bracket is reported for age (Median bracket 3 which = 31-35 years , mean = 3.54) and professional experience (Median bracket 5 which = 5-7 years , mean = 5.04) .Gender was coded 1 female, 0 male. In the Spread column, parenthetical values are Standard Deviations (SD), and bracket values [%] are percentages of respondents coded 1 in the sample.

* $p < .05$, ** $p < .01$

4.2.2.1: Logistic regression: persona model

When predicting persona exposure, the full model with the set of predictors against the null model with no predictors was not significant: $\chi^2(7, N = 122) = 8.50$, $p > .05$, indicating that the set of predictors does not reliably distinguish between individuals with Designer job titles who had exposure to personas from those who had not.

4.2.2.2: Logistic regression: scenario model

The scenario model was a better predictor of exposure to the method than the persona model.[19] A test of the full model with the set of predictors against the null model with no predictors was significant, $\chi^2(7, N = 122) = 17.81, p < .05$, indicating that the set of predictors reliably distinguished between Designers who had been exposed to scenarios from those who had not. The approximate variance in predicting scenario exposure accounted for by the set of predictors was 19% using Nagelkerke's formula. The classification table shows 81% of respondents who had not been exposed to scenarios were predicted correctly (model specificity), while 47% of respondents who had scenario experience were predicted correctly (model sensitivity), with an overall hit rate of 69% (which is an improvement of the null model's hit rate of 65%), see Table 7.

Table 7: Classification table predicting scenario exposure

	Predicted		Percentage Correct
	No	Yes	
No scenario exposure	64	15	81.0%
Yes, I have used or created scenarios (or both)	23	20	46.5%
		Total (Hit rate)	68.8%

The cut value is .500

[19] However, I as stated previously, this does not necessarily represent exposure to context scenarios. Later, I asked for a scenario definition in the follow-up survey and study as a filter for scenario type so that I could be specific about scenario type.

According to the Wald criterion, years of professional experience reliably predicted exposure to the scenario method, $b = .41$, $SE = .17$, Wald (1) = 5.64, $p < .05$, see Table 8. If respondents reported one bracket above the median, then they had an approximately 7.3% greater probability of reporting exposure to the scenario method; reporting one experience bracket under the median resulted in 5.7 % decreased probability of exposure to scenarios, holding all other variables constant at their median/mode. See Figure 10 for predicted probabilities and actual scenario exposure by professional experience.

Table 8: Multiple logistic regression predicting scenario exposure

	χ^2	*Nagelkerke* R^2	*b*	*(SE)*	*Wald(1)*	*exp(b)*	*95% CI*	
Model	*17.81(7)**	*.19*						
Intercept			-3.67	(1.40)	6.85 *	0.03		
Age			0.07	(0.14)	0.22	1.07	*0.81*	*1.42*
Gender			0.64	(0.49)	1.74	1.90	*0.73*	*4.92*
Professional_Experience			0.41	(0.17)	5.64 *	1.51	*1.07*	*2.12*
Job_Designer			0.36	(1.17)	0.09	1.43	*0.15*	*14.10*
Job_InformationArchitect			0.16	(1.22)	0.02	1.17	*0.11*	*12.88*
Job_InteractionDesigner			0.99	(1.18)	0.70	2.69	*0.27*	*27.13*
Job_Developer			0.55	(1.15)	0.23	1.74	*0.18*	*16.56*

* $p < .05$

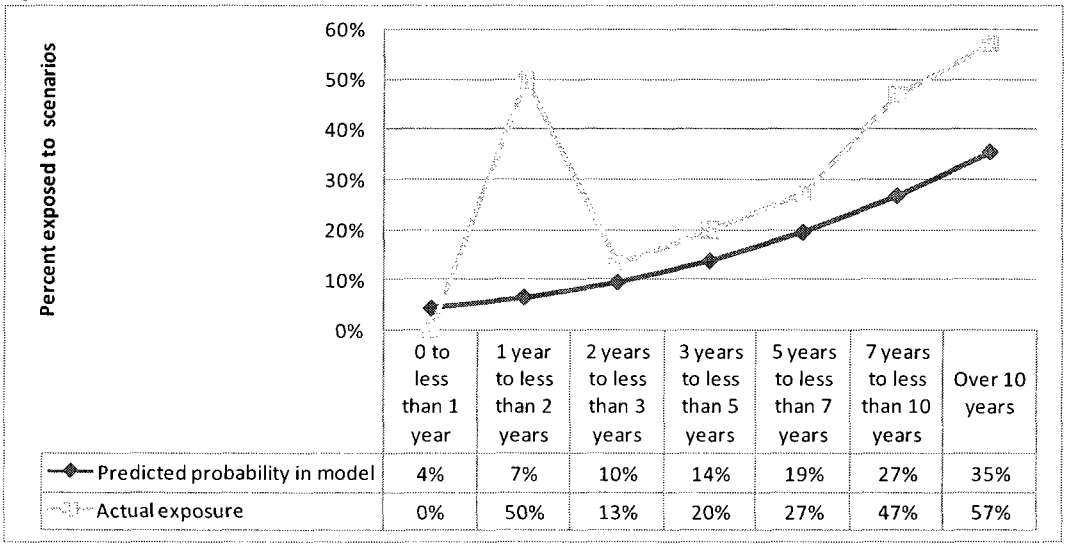


Figure 10: Scenario exposure by professional experience (Designers only)

While not at a significant level, the coefficients for the remaining variables indicate that age was positively associated with prediction, meaning the older the respondent the more likely the model predicted scenario exposure. Females were more likely to report UX research exposure. All job titles were positively associated with reported scenario exposure.

In summation, the models reliably predicted exposure UX research in general, and to scenarios (although not necessarily context scenarios) specifically, among respondents reporting Designer job titles. Professional experience was the only single reliable predictor and was positively associated with UX research exposure. In other words, the more experienced the respondent, the more likely they were to have been exposed to UX research. Logistic regression was performed to identify if UX researchers could predict who might have experienced use of personas and/or scenarios. These finding indicate that UX researchers can expect that designers with more professional experience to be more likely to have familiarity with UX research methods; however, job titles, age, and gender are not significantly suggestive of UX research exposure.

4.2.3: Job Responsibilities

In this section, I describe the results of the open-ended probe which asked respondents to "*briefly describe their job responsibilities*." The analysis of this question justified the segmentation of responders into their respective job title groups (Designers, UX Centric, and Management). The analysis also provided an understanding about how professionals who create software/technologies describe their jobs, who they feel is the beneficiary of their work (i.e. users, customers, clients or their company) and how they include users in the descriptions. A total of 166 (87%) respondents answered this question in some way; however, 17 simply listed their job title or multiple job titles as descriptions and an additional 14 of the responses came from respondents who had written in an "other" job title rendering their descriptions difficult to categorize. Therefore, I did not code those 31

responses resulting in a total of 135 coded responses. See Figure 11 for the number of code-able responses by job title.

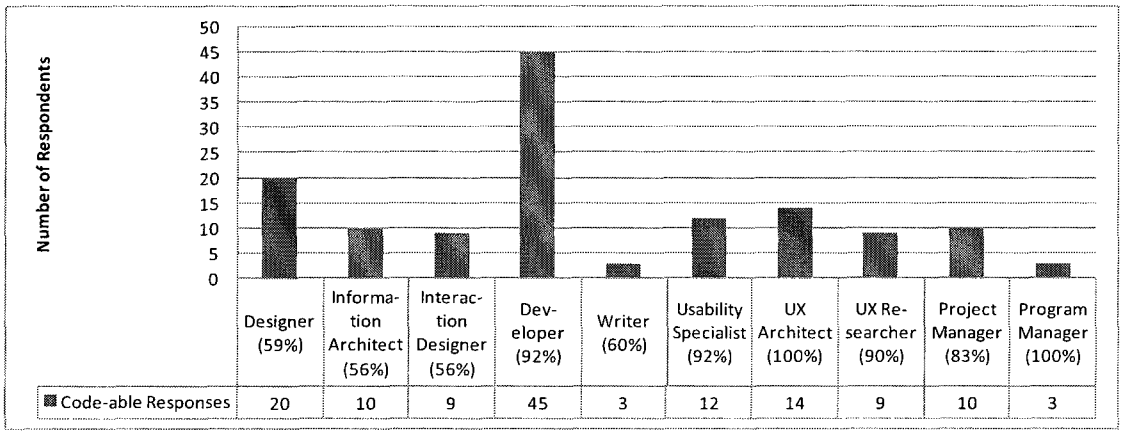


Figure 11: Coded responses by job title

Eight job description categories emerged from the data. The categories included: (1) discussion of who benefits from the responder's work (user, customer/consumer, client, stakeholder or their company); (2) methods respondents utilized to involve users; (3) deliverables respondents created; (4) deliverables respondents received from others; (5) tasks and deliverables which focused on development (including coding) for which respondents were responsible; (6) the platform/technology at which deliverables were aimed; (7) the use of analytics (data and databases) to gain an understanding of product success; and (8) mention of other co-workers and/or teams. See Table 9 for a detail of each area and keywords, phrase or concept that was coded.[20] The next sections discuss how responders described their job responsibilities, followed by a discussion of how the beneficiary of their work was included in their descriptions and specifically how the term 'user' was included.

[20] Coding followed two rules: (a) keywords could be coded in multiple areas depending on how the keyword was described, for example, websites were described as both a targeted platform and as a deliverable; and (b) each respondent could be coded for any one keyword or phrase once, for example, if they mentioned the user 10 times in their description, they would only be coded for the word user once.

Table 9: Major categories of job descriptions

Response category	Searched keywords or phrases/ideas
Beneficiaries of their work (end users)	Users, consumers, customers, stakeholders, clients or any reference to the business as the beneficiary
Methods involving users (that the respondent used/created)	Usability, UCD, HCD, user research (general), personas, scenarios, eye tracking, contextual inquiry/research, heuristic evaluation, focus groups, ethnography, interviews, affinity diagram, survey
Deliverables created	Graphics, interface, UI, site maps, prototypes, documentation (about users, document for users (included help systems), documentation about the product (specifications), use cases, content (written), test/ research plans, navigation schema (Information architecture) , reports/presentations, design (if this was the deliverable).
Deliverables received from others	Requirements, specifications, specs, uses cases
Deliverables/tasks: development related	Coding, bugs, testing (for functionality), features, function, database
Targeted platform / technology	Software, web-based, website, mobile, PDA, system, database, server, server-side technology
Data considerations	Analytics, database, a/b testing
Team considerations	Team, manage, or any reference to co-workers

The following sections describe: how respondents described their job responsibilities (section 4.2.3.1); how the beneficiary of the respondent's work was discussed (section 4.2.3.2); and a summary of the job responsibility findings (section 4.2.3.3).

4.2.3.1: How did responders describe their job responsibilities?

Job titles (not surprisingly) influenced what responders focused on as part of their descriptions; however, most job descriptions concentrated on deliverables required as part of their jobs. Table 10 displays results from each job title which includes: (a) an associated summative job description I culled from the responses; (b) response details including how many of the respondents reported UX research exposure; and (c) the categorized coded responses displayed in a heat map where the darker the area the more coded responses in the category.

Table 10: Job title by response category

Job Title: *"Summative job descriptions"*	Details	Response (keywords/phrases) categories: Targeted beneficiary	Methods involving users	Deliverables created	Deliverables received	Development responsibility	Targeted platform	Analytics	Design team consideration
Designer: *"Visual design and development of interfaces for websites"*	N = 20 responders N = 48 keywords % UX exposure 85%	8%	4%	**33%**	0%	19%	29%	0%	6%
Interaction Designer: *"I create/define the product specifications and communicate these requirements to team members."*	N = 10 responders N = 24 keywords % UX exposure 90%	13%	4%	**50%**	8%	0%	8%	0%	17%
Information Architect: *"Evaluating interfaces through database analysis and contribution to design through prototypes"*	N = 9 responders N = 30 keywords % UX exposure 89%	13%	3%	**40%**	3%	3%	13%	17%	7%
Developer: *"Code and test the functionality of databases and/or other web-based systems"*	N = 45 responders N = 85 keywords % UX exposure 60%	2%	1%	11%	0%	32%	**47%**	0%	7%
Writer: *N/A* - There was no pattern in the small sample	N = 3 responders N = 10 keywords % UX exposure 100%	10%	20%	**30%**	0%	10%	20%	0%	10%
Usability specialist: *"Ensuring interface usability through direct testing with users"*	N = 12 responders N = 45 keywords % UX exposure 100%	20%	**42%**	7%	0%	4%	11%	7%	9%
UX Architect: *"Conducting UX research and utilizing results to inform the navigation and design of user interfaces"*	N = 14 responders N = 64 keywords % UX exposure 100%	20%	**32%**	28%	0%	2%	11%	0%	8%
UX Researcher: *"Conducting UX research through a variety of user-centered methods, analyzing and communicating the results"*	N = 9 responders N = 22 keywords % UX exposure 100%	18%	**59%**	18%	0%	0%	5%	0%	0%
Project Manager: *"Creating deliverables (specifications, requirements, etc.) to guide and manage the design of software"*	N = 10 responders N = 37 keywords % UX exposure 90%	14%	16%	**32%**	0%	8%	16%	0%	14%
Program Manager: *N/A* - There was no pattern in the small sample	N = 3 responders N = 9 keywords % UX exposure 100%	33%	0%	**44%**	0%	11%	0%	0%	11%

(The category columns indicate the percentage of coded comments for each job title)

4.2.3.1a: Designers (N = 20 responders, N = 48 coded keywords/phrases). A summative job description for Designers from the screening survey sample might read, "*I create visual designs and develop interfaces for websites and web-based products.*" Designers focused most on the deliverables they created followed by the targeted platform. An additional large portion (19%) of coded comments discussed development responsibilities as part of their jobs, including coding and bug testing. The two main focuses were:

- *Deliverables created.* Sixteen (33%) of coded keywords/phrases focused on deliverables. Keyword coded deliverables included, graphics, interfaces, design specifications and designs for websites. An example included:
  - "...create original digital artwork and UI elements such as graphics, logo," Respondent 183.
- *Targeted platform.* Fourteen (29%) of the coded keywords/phrases were concerned with a targeted platform; 83% of these coded keywords/phrases specifically discussed creating designs for websites or web-based products/services. An example included:
  - "I design websites," Respondent 049.

4.2.3.1b: Interaction Designers (N = 10 responders, N = 24 keywords/phrases). A summative job description for Interaction Designers from the screening survey sample might read, "*I create and define product specifications and communicate these requirements to other members of my team.*" Interaction Designer job descriptions focused mostly on the deliverables they created followed by working with their team/coworkers. Additionally, half (50%) of the respondents concentrated on early phases of the product cycle in which respondents discussed how their work had shaped products prior to system coding. For example, Respondent 145 wrote "define the behavior of products and systems." The two main focuses were:

- *Deliverables created.* Twelve (50%) of all coded keywords/phrases focused on deliverables. Keyword coded deliverables included mock-ups, wireframes, user interfaces, graphics, use cases, user requirements and design specifications. An example included:
    - "Design user interfaces for web applications. A bit of IA as well as a lot of visual design," Respondent 066.

- *Design team.* Five (17%) of the all coded keywords/phrases concerned working or managing other members of the design team, for example:
    - "Write spec documents for coders and qa *(sic)* to use," Respondent 077.

4.2.3.1c: Information Architects (N = 9 responders, N = 30 coded keywords/phrases). A summative job description for Information Architects from the screening survey sample might read, "*I contribute to product design by developing prototypes, wireframes and site maps that were informed by evaluation of user interfaces through database analysis.*" Information Architects also focused primarily on deliverables they were tasked with creating followed by the use of analytics to inform their evaluations. The two main focuses were:

- *Deliverables.* Twelve (40%) of all coded keywords/phrases focused on deliverables. Deliverables included interfaces, prototypes, site maps, help documentation for users, specification for labels, and documentation of the "business process." An example included:
    - "Develop communication pieces to support client requirements such as site maps, wireframes and user flow diagrams," Respondent 146.

- *Use of data and analytics.* Five (17%) of the all coded comments concerned the use of data and analytics to inform interface evaluation, for example:

- "Database design and development. Data analysis, data conversion, data," Respondent 179

4.2.3.1d: Developers (N = 45 responders, N = 85 coded keywords/phrase). A summative job description for Developers from the screening survey sample might read, "*I code and test the functionality of databases and/or other web-based systems.*" In contrast to the first three job titles described above, Developers focused primarily on describing the platform they targeted and (not surprisingly) their development responsibilities. The two main focuses were:

- *Targeted platform.* Forty (47%) of coded keywords/phrases focused on a targeted platform. Platforms included the web, server-side technologies, databases, PC software and Microsoft technologies. An example included:
  - "Develop windows and web applications using Microsoft technologies such as VB, ASP, C#, ASP.NET, C++, SQL Server," Respondent 029.

- *Development responsibilities.* Twenty-seven (32%) of coded keywords were concerned with development responsibilities. Over half (51%) of the Developer respondents specifically mention coding either explicitly or by detailing the type of code they write by language, for example:
  - "Develop code for an online offering of a major local company in ASP.NET," Respondent 031.

  Four respondents also described testing functionality, for example,
  - "Design, development and testing tools and runtime around XML technologies," Respondent 039 stated

4.2.3.1e: Writers (N = 3 responders, N = 10 coded keywords/phrase). With only three responses, there was no summative resulting job description. The three

writers focused primarily on detailing their deliverables which concentrated on content or documentation. Submissions included:

- Respondent 063 focused on content:
  - "Develop web site content on project basis. Develop support content for software applications and web sites."
- Respondent 104 concentrated on the UX research aspects of her job:
  - "In addition to writing, we contribute to the user experience in the design phase of the product. We provide input on the user experience/usability. We also do site visits to research usability."
- Lastly, Respondent 184 reported involvement in testing for functionality and usability:
  - "I've spent many years testing and documenting non-released and released software, discovering and documenting literally thousands of bugs, doing bug regression, making usability suggestions, and so forth."

Both of the Writers who claimed to be 'users and creators/conductors' of UX research (Respondents 104 and 184) also mentioned users and/or usability in their job descriptions.

4.2.3.1f: Usability Specialists (N = 12 responders, N = 45 coded keywords/phrase). A summative job description for Usability Specialists from the screening survey sample might read, "*I ensure interface usability through direct testing with users.*" Usability Specialists focused primarily on describing the methods they utilize to involve users; most (60%) explicitly included the keyword 'user' in their response. The two main focuses were:

- *Methods involving users.* Nineteen (42%) of coded keywords/phrases detailed multiple user methods including, usability, user research, contextual inquiry, heuristic evaluation, eye tracking, and focus groups, for example:

- "Usability analysis, user research, heuristic analysis, workflow design, technical communication, contextual research, usability testing," Respondent 048.

- *Targeted beneficiary.* Nine (20%) of coded keywords/phrases pertained to describing who the targeted beneficiary of their work is. Beneficiaries were most often referred to as a 'user' (six respondents), followed by 'customer' (two respondents) and 'client' (one respondent).

4.2.3.1g: UX Architect (N = 14 responders, N = 64 coded keywords/phrase). A summative job description for UX Architects from the screening survey sample might read, "*I conduct UX research and utilize the results to inform the navigation and design of user interfaces.*" UX Architects focused on describing the methods they utilize to involve users and the resulting deliverables that they create as a result of the research, both end products (finished interfaces) and communication devices to help other members of the team utilize the research. The two main focuses were:

- *Methods involving users.* Twenty (31%) of coded keywords/phrases described multiple user methods including, usability, user research in general, survey, interviews, and personas. An example included:
  - "Conduct user research (surveys, interviews, competitive analysis, etc)," Respondent 101.

- *Deliverables created.* Eighteen (28%) of coded keywords detailed multiple types of deliverables they created. These included finished end user interfaces, graphics, and deliverables meant to communicate user research to other design team members. Communication deliverables included wireframes, site maps, specifications, reports and presentations. An example included:

- "...creates wireframes for designs. Do design iterations based on internal feedback and on user testing. Sometimes do finished look and feel for product," Respondent 027

4.2.3.1h: UX Researchers (N = 9 responders, N = 22 coded keywords/phrase). A summative job description for UX Researchers from the screening survey sample might read, "*I conducted UX research through a variety of user-centered methods, then analyze and communicate the results to other team members.*" Much like the UX Architects, UX Researchers focused primarily on describing their research methods and their deliverables which were means by which they communicated the research to other members of the team. The two main focuses were:

- *Methods involving users.* Thirteen (59%) of coded keywords/phrases described research methods used, which included: interviews, surveys, focus groups, observation, usability and heuristic evaluation. Most focused on usability (four respondents), for example:
  - "Did usability evaluation, and wrote focus group guide," Respondent 065

- *Deliverables created.* Four (18%) of coded keywords referred to deliverables aimed for other members of the design team, including prototypes, interaction design, guides on how to conduct focus groups and presentations, for example:
  - "Analyzing the user data and presenting/synthesizing the results," Respondent 047.

4.2.3.1i: Project Managers (N = 10 responders, N = 37 coded keywords/phrase). A summative job description for Project Managers from the screening survey sample might read, "*I create the deliverables (specifications, requirements, etc.) that guide and manage the design of software.*" Project Managers focused on describing their deliverables and the means by which they

communicated to other members of the team. They also focused on describing methods that involved users and the platform in which their software was targeted. The three main focuses were:

- *Deliverables created.* Twelve (32%) of coded keywords/phrases described deliverables which included specification documentation, requirements, reports, and presentations. Four respondents also wrote that they were responsible for interface design or information architecture, for example,
    - "Write functional specs, translate business requirements to functional requirements, Do information architecture," Respondent 059.
- *Methods involving users.* Six (16%) of coded keywords referred methods used that involved users, including usability, heuristic evaluation, surveys and interviews.
- *Targeted platform.* Six (16%) of the coded keywords were about the targeted platform, including, websites, PC software, and server-side technologies.

4.2.3.1l: Program Managers (N = 3 responders, N = 10 coded keywords/phrase). With only three responses, there was no summative resulting job description. The three Program Managers focused primarily on detailing their deliverables followed by a mention of the targeted beneficiary.

- Respondent 176 described a very multidisciplinary job when she wrote:
    - "Manage implementation of new communities (blogs, forums, media, wikis, groups). Consult with clients, coordinate design, development, test, and ops. Develop functional requirements, wireframes and project artifacts. Keep project schedule and budget on task."
- Respondent 005 concentrated on the management and deliverables of aspects of his job:

- "Lead the gathering and specification of the requirements of the software (all external, customer visible behavior including UI)"

- Respondent 060 simply reported that he *"created function specs."*

4.2.3.2: How is the beneficiary of their work discussed?

Two respondents wrote of their company as being the primary beneficiary of their work (one Project Manager and one Program Manager). The remaining beneficiaries that were coded by searching for keywords in responses; keywords were 'user(s)', 'customer(s)', 'consumer(s)', 'client(s)', or a 'stakeholder(s)'. In all, 33% of respondents mentioned a beneficiary as part of their job descriptions, most of these (65%) using the label of 'user (s)'. In comparing job titles, User Experience Architects were the most likely to include a beneficiary as part of their description, and Developers were the least likely, see Figure 12.

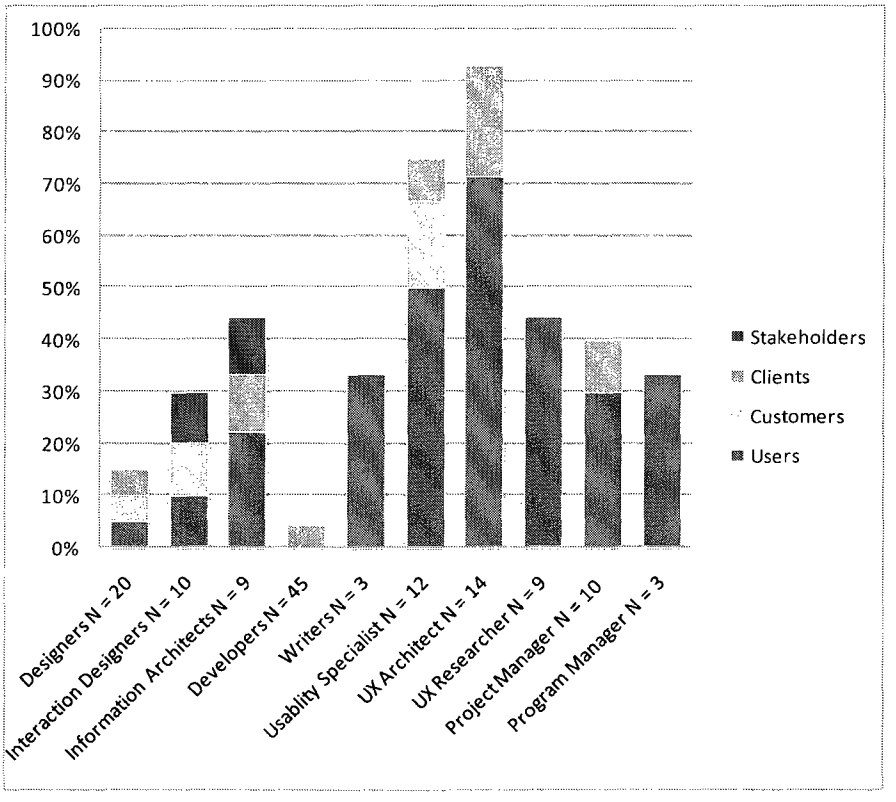


Figure 12: Explicit mention of human beneficiary by job title

4.2.3.3: Summary: Job Responsibilities Findings

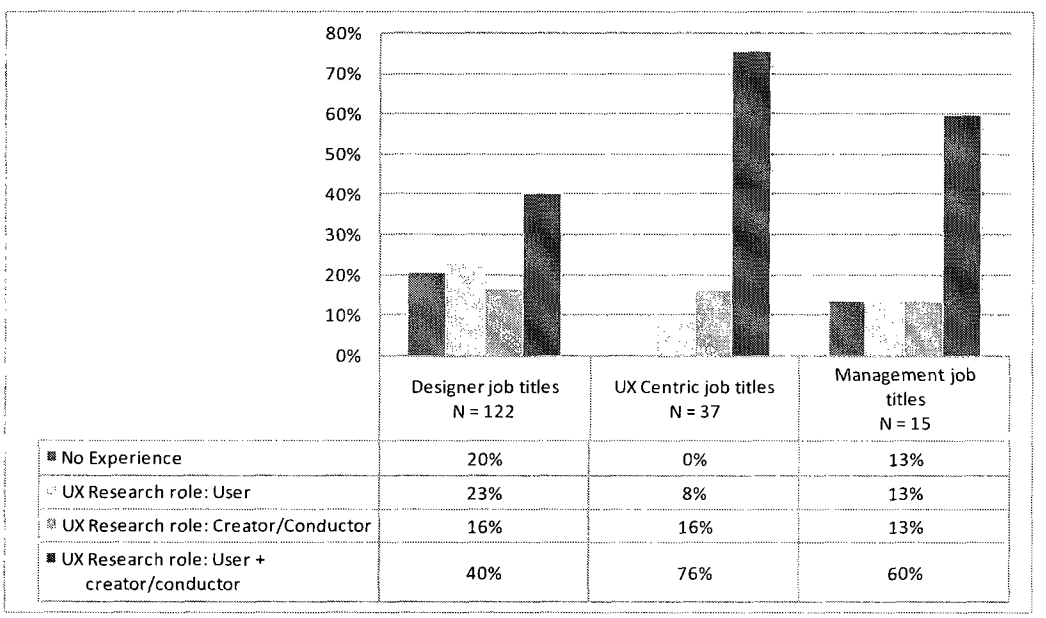
There were two major findings from the job responsibility findings that had an effect on this dissertation work: (1) relatively few responders in the Designer job titles specifically mention any type of end user in their job descriptions; and (2) there was clear distinction among those who are charged with conducting and creating user research materials (UX Centric job titles) from those who are not (Designer job titles) which justified the segmentation of the job title types.

UX research exposure did not translate into a high mention of users in the job descriptions. In other words, while the level of UX exposure is reportedly quite high among respondents in all job titles, (the lowest being developers at 60% and all other job titles reporting exposure at 85% or above, see Table 10), there was not a corollary high mention of end users (either 'user(s)' or 'customer(s)' or 'consumer(s)'). Whereas a high percentage, 57%, of responders in the three UX Centric jobs (Usability Specialist, UX Architect, and UX Researcher) mentioned end users as part of their job responsibilities, only 8% of all other responders reported end users in their job descriptions. This suggests that beyond the UX Centric job titles, professionals who create technology are not highly focused on end users as part of their job responsibilities.

This divide, between the job titles that focus on UX research and those that focus on deliverables, supports the assumption that UX research is more often conducted by one group and then communicated to another. In other words, this finding supports assertions by others (Pruitt & Adlin, 2006) that very few professionals are tasked with both user research and creation of technology. This suggests that the need for communication between the groups, whether it is facilitated by personas and context scenarios or some other tool, is critical to how end users are included in the design and development process.

As a confirmation of this relationship between job title and UX research experience, I analyzed the relationship among the role respondents reported in their

experience with UX research and job title type (Designer, UX Centric and Management). The relationship was significant, χ^2 (6, N = 174) = 19.00, $p < .05$. While 23% of Designers claimed they were 'users' of UX research, only 8% and 13% of those with UX Centric and Management jobs, respectively, claimed to be 'users'. A large majority (76%) of UX Centric job responders reported their role as 'user + conductor/creator', while a minority (40%) of Designers reported the same role. See Figure 13 for a breakdown of job title type by UX research experience. This finding provides further support that there is usually a division of UX research responsibilities that falls along professional job title types, i.e., Designer, UX Centric and Management.



	Designer job titles N = 122	UX Centric job titles N = 37	Management job titles N = 15
No Experience	20%	0%	13%
UX Research role: User	23%	8%	13%
UX Research role: Creator/Conductor	16%	16%	13%
UX Research role: User + creator/conductor	40%	76%	60%

Figure 13: Reported UX research role by job title type

4.2.4: Responses to the Gould and Lewis (1985) query

In total 158 (83%) of the respondents provided answers that were able to be coded to the Gould and Lewis query: "*List three to five major steps you consider good practice for designing, developing and evaluating a new computer system for users.*" Recall that in the original study the authors were looking for adherence to three principles: (1) early focus on the user, which could include interviews and

contextual inquiry in an early phase of the design process; (2) empirical measurement which included usability or reference to other testing that included users; and (3) iterative design, which included the use of early versions of the product by way of prototypes, mock-ups and wireframes that could be used for iterative user evaluation. Using a "very liberal scoring system," Gould and Lewis reported that only 2% mentioned all three principles and 26% did not mention any of the three principles.

Twenty-five years after the original study some of these findings were more encouraging; however, the screening survey sample included three UX Centric job titles that would be expected to be more likely to mention all three principles.

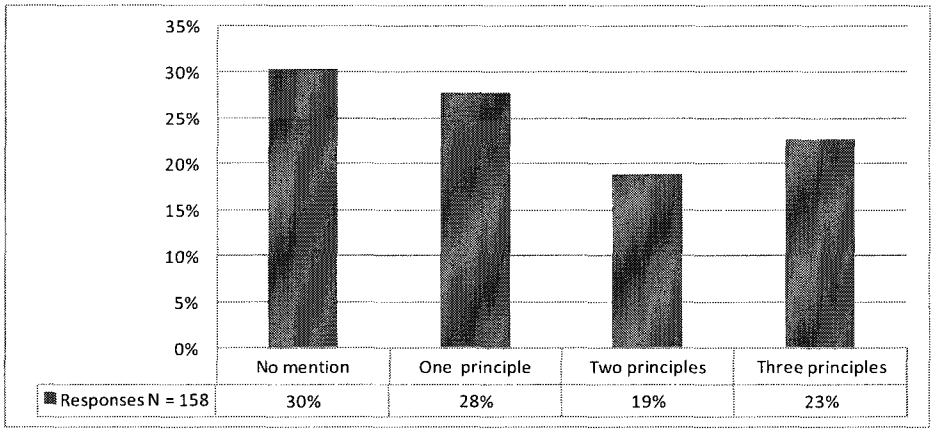


Figure 14: Gould and Lewis query response by number of mentions

About one quarter (23%) of the screening survey respondents mentioned all three principles in their responses; however, 30% did not include any of the principles, see Figure 14. The mean number principles mentioned was 1.12 (*SD* = 1.15). Early user involvement had the highest recognition, followed by empirical testing, and then iteration based on user data, see Figure 15.

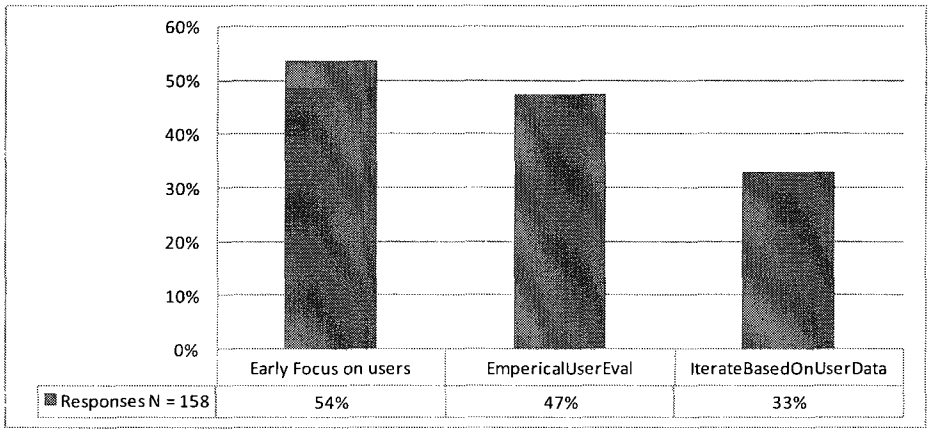
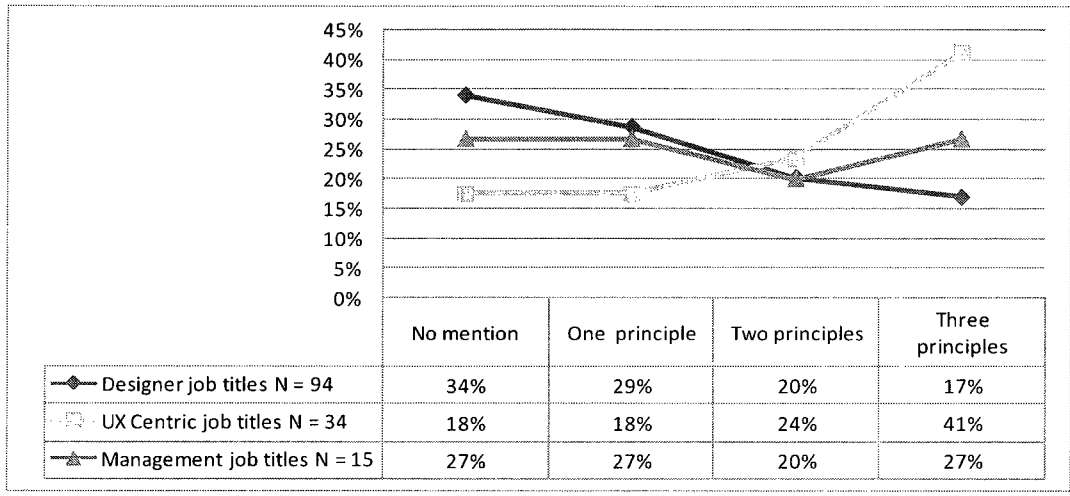


Figure 15: Gould and Lewis query response by type

Inter-rater reliability was performed by a Masters student in the Department of Human Centered Design & Engineering who independently coded the responses. First, the reliability coefficient was calculated by dividing the number of agreements between the Masters student and me by the total number of possible agreements (158 x 3). The resulting inter-rater reliability coefficient was .810 indicating a strong level of agreement.

Second, I calculated pair-wise agreement for each principle using Cohen's Kappa; I found that agreement was higher for the first two principles (early focus on users and empirical measurement) than for the last (iteration). For the 'early user focus' measure the inter-rater reliability was $\kappa = .66$, $p < .001$, indicating a substantial agreement (Landis & Koch, 1977). For the 'empirical measurement' score the inter-rater reliability was $\kappa = .64$, $p < .001$, which was also in the substantial agreement range. Finally, for the 'iteration' measure the reliability between the raters was found to be $\kappa = .42$, $p < .001$, which is considered a moderate agreement level (Landis & Koch, 1977). In total, inter-rater reliability was considered in the moderate to substantial range, indicating a high level of consensus between me and the Masters student when scoring the responses independently.

Next, I investigated relationships among job title types and adherence to the three principles. While respondents reporting a UX Centric job were very likely to mention at least two principles (65%) only 37% of those with Designer job titles mentioned at least two, see Figure 16. To test the significance of this difference, I conducted an ANOVA with job title type as the independent variable and respondent's 'Gould and Lewis score" (GLscore, ranging from 0-3) as the dependent variable.



	No mention	One principle	Two principles	Three principles
Designer job titles N = 94	34%	29%	20%	17%
UX Centric job titles N = 34	18%	18%	24%	41%
Management job titles N = 15	27%	27%	20%	27%

Figure 16: Gould and Lewis query response by job title type

The test was significant, $F_{(2,140)} = 4.67$, $p < .05$, $f = .33$, indicating that job title type was significantly associated with an overall score. Respondents with UX Centric jobs ($N = 34$) recorded the highest scores ($M = 1.88$, $SD = 1.50$), followed by Management jobs ($N = 14$, $M = 1.47$, $SD = 1.19$). Respondents in Designer job titles ($N = 94$) scored the lowest, ($M = 1.20$, $SD = 1.09$).

Since I was primarily interested in establishing HCD orientation for the Designer job titles, I isolated those reporting Designer job titles who also answered the Gould and Lewis probe ($N = 94$). I analyzed these respondents' GL score against four constructs: (1) Designer professional profile (section 4.2.4.1); (2)

Designer personal profile (section 4.2.4.2)[21]; (3) previous UX research exposure (section 4.2.4.3)[22]; and (4) how users were discussed in the responses (section 4.2.4.4). The construct analysis is followed by a summary (section 4.2.4.5).

4.2.4.1: Construct one: Associations among GL score and designer professional profile

An ANOVA was employed using the GL score as the independent variable and professional experience as the dependent variable. While there was no significant association between professional experience and a score on the Gould and Lewis test, $F_{(3, 90)} = 2.31, p = .081$, there is an upward trend where the most experienced tended to score higher on the Gould and Lewis probe, see Figure 17.

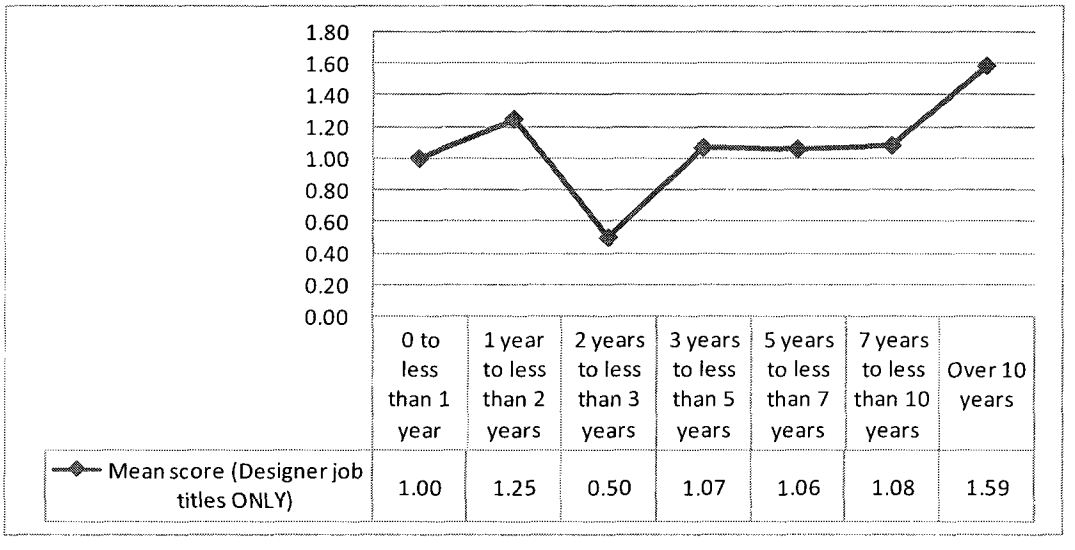


Figure 17: Gould and Lewis score by Designer professional experience

[21] To avoid an inflated Type I error rate by conducting multiple comparisons with constructs one and two, I used an adjusted alpha using a Bonferroni correction for each construct. There were two variables in each construct; consequently the alpha was reduced to .025 (.05/2) for each construct.

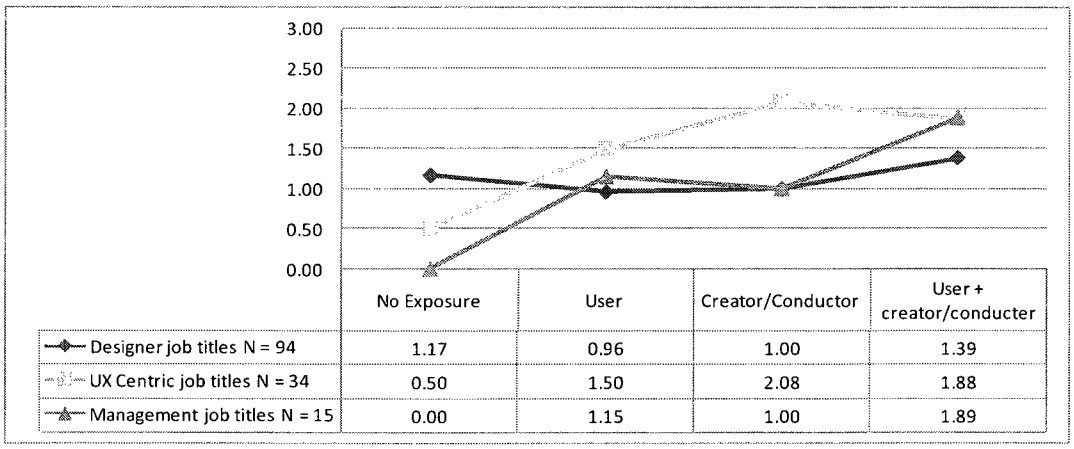
To analyze associations between the GL score and Designer job title I utilized a Chi-square test. The findings were not significant suggesting that there is no association between individual designer job titles and GL score.

4.2.4.2: Construct two: Associations among GL score and designer personal profile

I performed two univariate tests to explore if a designer's personal profile (age through ANOVA and gender through Chi-square) was associated with their GL score. No significant associations were found, indicating that a responder's GL score was independent from a Designer's age or gender.

4.2.4.3: Construct three: Associations among GL score UX research exposure

There was no significant association between UX research exposure and GL score among respondents with Designer job titles. While there was a clear upward trend among UX research exposure and GL score among UX Centric and Management job titles, the Designer job title trend is relatively flat, see Figure 18.



	No Exposure	User	Creator/Conductor	User + creator/conducter
Designer job titles N = 94	1.17	0.96	1.00	1.39
UX Centric job titles N = 34	0.50	1.50	2.08	1.88
Management job titles N = 15	0.00	1.15	1.00	1.89

Figure 18: Gould and Lewis score by job type and UX research exposure

4.2.4.4: Construct four: How users were discussed in the responses by Designers

The responses were also coded for how end users were discussed in the responses. Almost half (44%) of Designers specifically included the term 'user(s)' in their description, while an additional 10% included 'customer(s)' or 'consumer(s)', see Figure 19. Further univariate tests were performed to identify if designer profile variables (age, gender, professional experience and job title) were associated with including 'user' in the Gould and Lewis responses; no significant associations were found suggesting that Designers as a group were somewhat homogenous in regards to their inclusion of 'users' in their response.

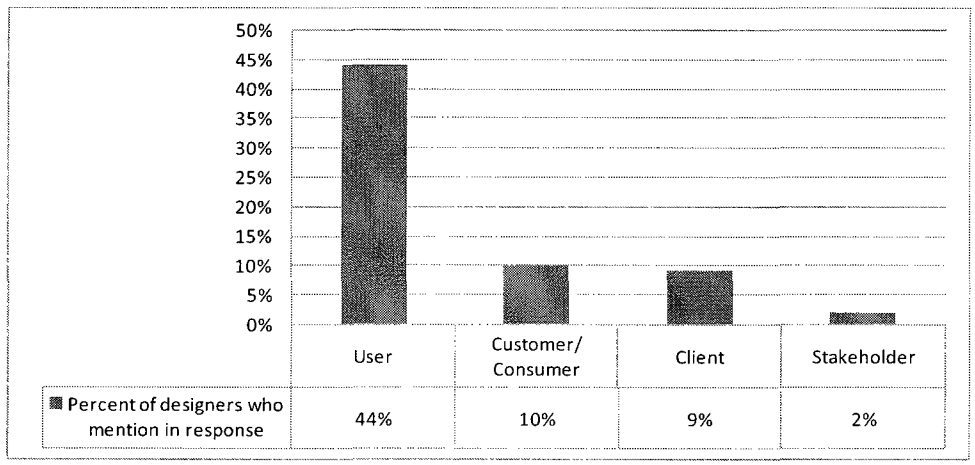
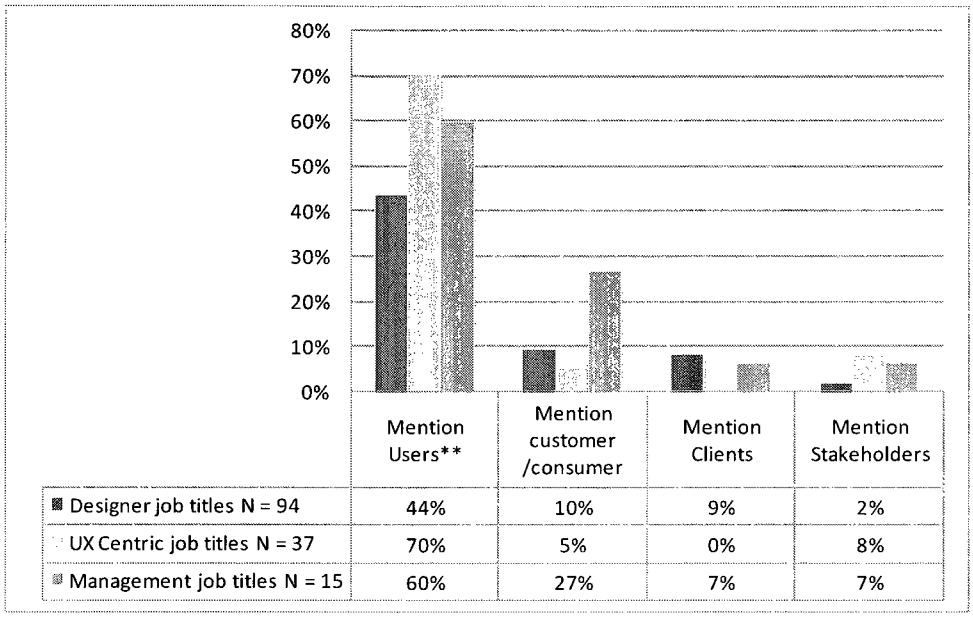


Figure 19: How users were discussed in the Gould and Lewis query by Designers

Next, I analyzed whether including the word 'user' was associated with job title type. Job title type was significantly associated with whether the term 'user' was included in the response, χ^2 (2, N = 146) = 0.19, $p < .05$, see Figure 20. Those with Designer job titles were much less likely to mention users in their responses when compared to UX Centric job titles and Management job titles.



	Mention Users**	Mention customer /consumer	Mention Clients	Mention Stakeholders
Designer job titles N = 94	44%	10%	9%	2%
UX Centric job titles N = 37	70%	5%	0%	8%
Management job titles N = 15	60%	27%	7%	7%

Figure 20: Mention of user/customer/client/stakeholder by job title type

4.2.4.5: Summation of Gould and Lewis query responses

Three major findings came from analyzing the responses to the Gould and Lewis query. First, that when considering all job titles, the screening survey sample was much more likely to include all three of the principles when compared to Gould and Lewis's results from twenty-five years ago. Whereas Gould and Lewis reported that only 2% of their participants mentioned all three principles, this study found that 23% in the overall screening survey sample mentioned all three principles. When isolating only the Designer job titles ($N = 94$), 17% mentioned all three principles which was still an improvement from the Gould and Lewis findings. However, the percent of respondents that failed to include of any of the three principles does not appear to have changed. About a third, (30% in the overall screening survey sample, 34% among the Designer job titles and 26% in the Gould and Lewis sample), did not mention *any* of the three principles.

Second, adherence to the three principles was significantly associated with job title type where responders with UX Centric jobs (not surprisingly) score the highest and responders with Designer jobs scoring the lowest. However, adherence

to the three principles was not significantly associated with any designer profile variables (age, gender, job title and professional experience) suggesting Designers are somewhat homogenous as a group in regards to the GL score.[23]

Third, the end user (either as a 'user(s)', 'customer(s)' or 'consumer(s)') was mentioned by a majority of the respondents. While designer profile variables (age, gender, job title and professional experience) were not associated with the inclusion of the term 'user' in the description, job title type was significantly associated with the specific inclusion of the term in responses. Those with Designer job titles were significantly less likely to include the specific term 'user(s)' as part of their descriptions when compared to the UX Centric and Management jobs.

4.2.5: Last Experience with UX Research

The last question in the screening survey was an open-ended probe asking respondents to discuss their last experience with UX research. Recall that the question appeared after respondents had been exposed to a list of possible HCD methods. The question wording was as follows:

> Please describe your last experience in conducting, creating or utilizing one or more of the methods listed above. For example, what was the project platform, e.g. mobile phone, web site? How long ago was this experience? Which method did you use? Was it successful? If you were given the research, how was it presented to you, e.g. in a report, as personas? If you conducted the research, how did you communicate about that research? Did you both conduct the research and use the research?...etc

Only those respondents who reported UX research exposure were shown the question about their last experience. A total of 123 respondents answered the probe in some way; however, 14 responses were not understandable or simply did not answer the question resulting in 109 responses that were able to be coded. Responses were coded for four constructs: (1) methods that included users

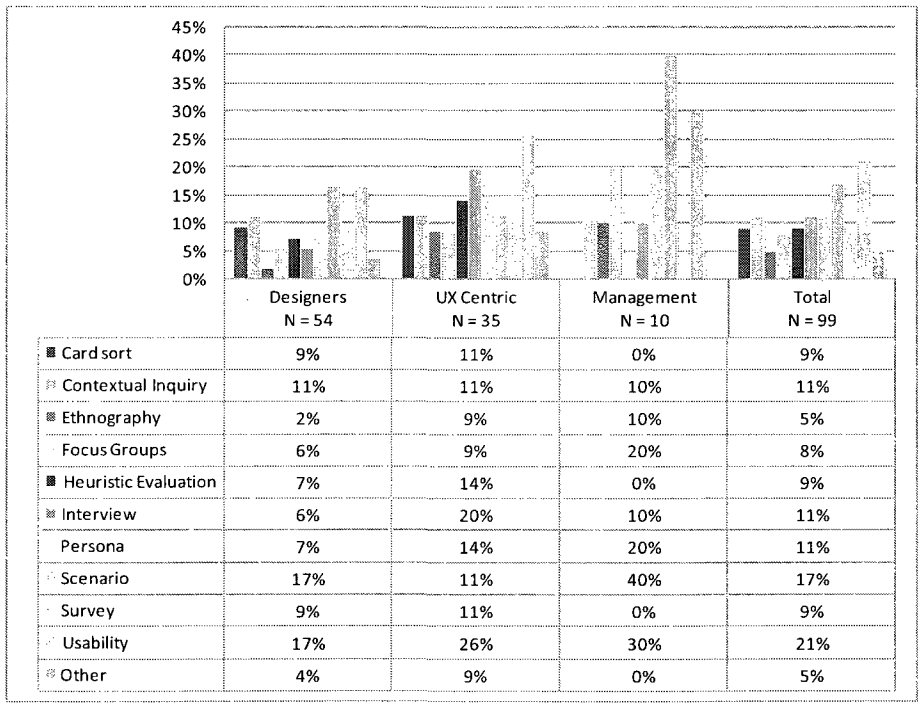
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[23] There was, however, a non significant positive trend associated with professional experience among responders with Designer job titles.

discussed (section 4.2.5.1); (2) how the end user was considered (section 4.2.5.2); (3) their implied role in respect to the UX research experiences (section 4.2.5.3); and (4) how they reported success (section 4.2.5.4). Lastly I summarize the last experience findings in section 4.2.5.5.

4.2.5.1: Construct one: methods discussed

In all, sixteen different methods that involve users were discussed in regard to respondent's last UX research experience. Usability was the most commonly mentioned method, followed by scenarios. See Figure 21 for a breakdown of methods that responders discussed by responder job title type.[24]



	Designers N = 54	UX Centric N = 35	Management N = 10	Total N = 99
Card sort	9%	11%	0%	9%
Contextual Inquiry	11%	11%	10%	11%
Ethnography	2%	9%	10%	5%
Focus Groups	6%	9%	20%	8%
Heuristic Evaluation	7%	14%	0%	9%
Interview	6%	20%	10%	11%
Persona	7%	14%	20%	11%
Scenario	17%	11%	40%	17%
Survey	9%	11%	0%	9%
Usability	17%	26%	30%	21%
Other	4%	9%	0%	5%

Figure 21: Methods discussed by job title type

The 'Other' methods category included those referenced by less than five responders. These included: a/b testing (one mention), analytics (two mentions),

[24] There were 99 responses that were able to be coded from those responders who could also be categorized in one of the three job title segments. This omitted 10 responses from those reporting in the 'other' category of job titles.

affinity diagramming (one mention), cognitive task analysis (one mention), eye tracking (two mentions), and work-flow analysis (one mention).

There was a significant association between job title type and the inclusion of any method in the description, χ^2 (2, N = 99) = 7.30, p <.05. Specifically, both the UX Centric and Management jobs were more likely to describe methods in their description of their last UX research experience, see Figure 22.

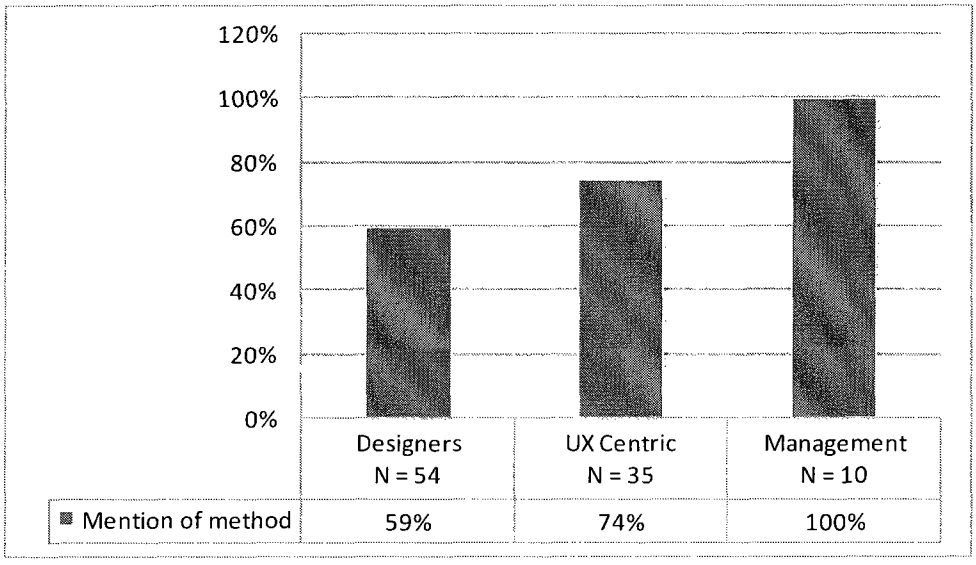
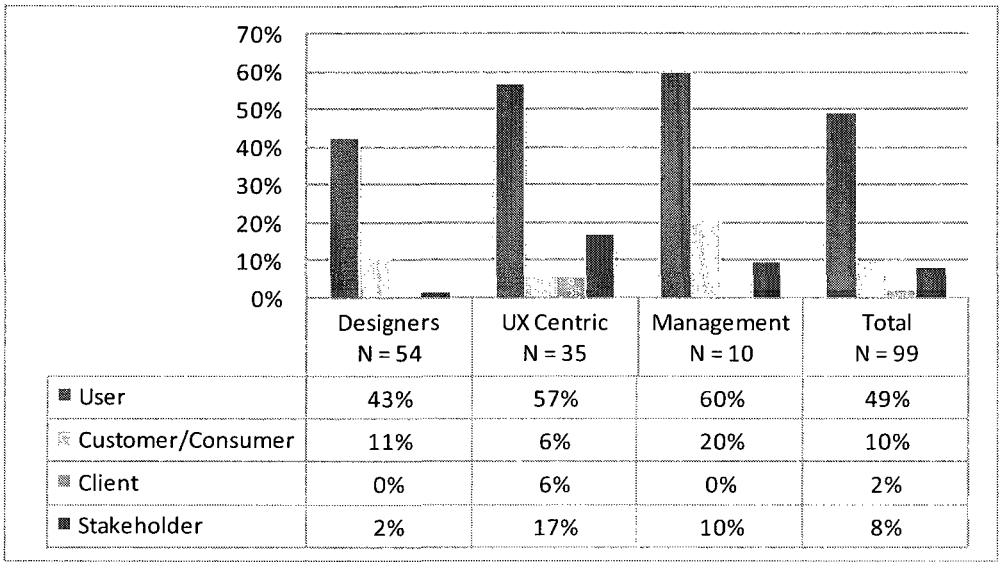


Figure 22: Inclusion of method in last UX research experience by job title type

4.2.5.2: How the end user was considered

About half (49%) of the 109 responders specifically referred to 'user(s)' when discussing their last experience with UX research, while another 10% used the terms 'consumer(s)' or 'customer(s)', see Figure 23. There were no significant associations among the job title types and the inclusion of end users, clients or stakeholders in the description of their last UX research experience. However, those with UX Centric jobs were significantly more likely to include the term 'client(s)' in their description χ^2 (2, N = 99) = 6.74, p <.05. No significant associations were found among designer profile variables (age, gender and experience) and how end users were considered in the response, suggesting

Designers were somewhat homogenous as a group in how they included end users when they discussed their last experience with UX research.



	Designers N = 54	UX Centric N = 35	Management N = 10	Total N = 99
User	43%	57%	60%	49%
Customer/Consumer	11%	6%	20%	10%
Client	0%	6%	0%	2%
Stakeholder	2%	17%	10%	8%

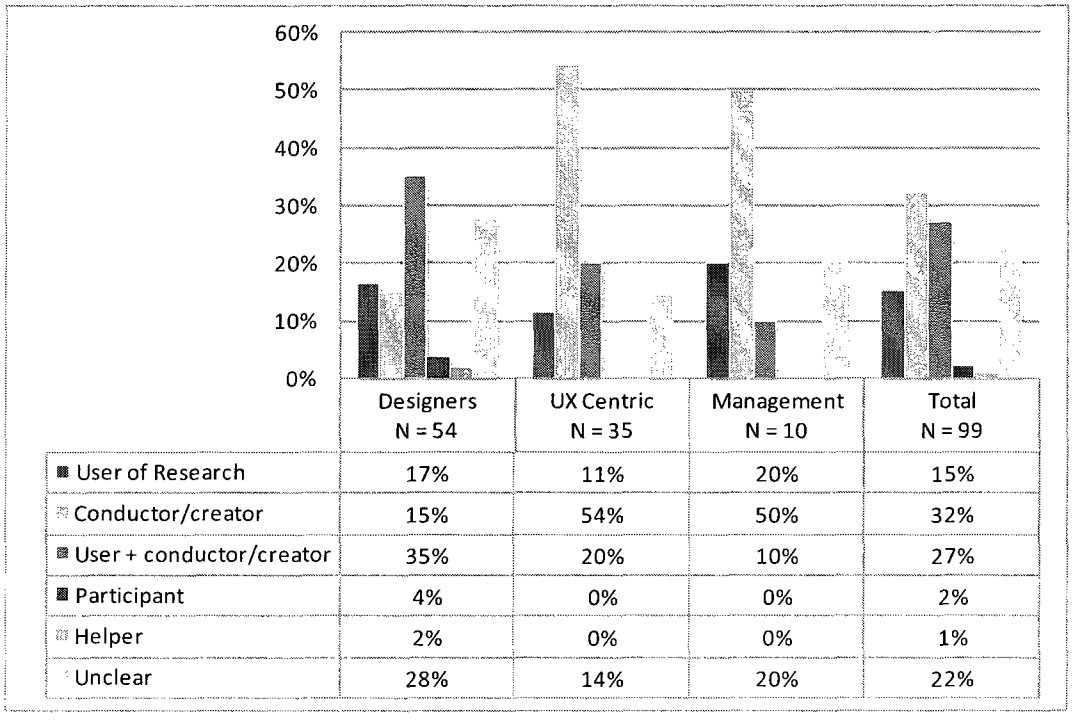
Figure 23: How the user was considered by job title type

4.2.5.3: Respondent's role in the last UX research experience

Respondent's last UX research experiences were also coded to determine the responder's role. Responses were coded as: (1) a user of the research; (2) a conductor/creator of the research; and (3) a user + conductor creator of the research. There were also three additional codes that emerged from the analysis: (4) a participant in UX research; (5) a helper or observer of others conducting UX research; and (6) their role was unclear from the description. Inter-rater reliability was performed by a Masters student in the Department of Human Centered Design & Engineering who independently coded the responses. Cohen's Kappa was calculated to determine the inter-rater reliability and found to be $\kappa = .53$, $p < .001$, indicating a moderately high level of agreement according to Landis & Koch (1977).

Most (54%) in the UX centric jobs were in the 'conductor/creator' role of UX research in their last experience, while those with Designer job titles were most likely to report being a 'user + conductor/creator', see Figure 24. The

differences among job title types was explored and found to be significant, χ^2 (10, $N = 99$) = 19.15, $p < .05$.[25]



	Designers N = 54	UX Centric N = 35	Management N = 10	Total N = 99
User of Research	17%	11%	20%	15%
Conductor/creator	15%	54%	50%	32%
User + conductor/creator	35%	20%	10%	27%
Participant	4%	0%	0%	2%
Helper	2%	0%	0%	1%
Unclear	28%	14%	20%	22%

Figure 24: Role in last UX research experience by job title type

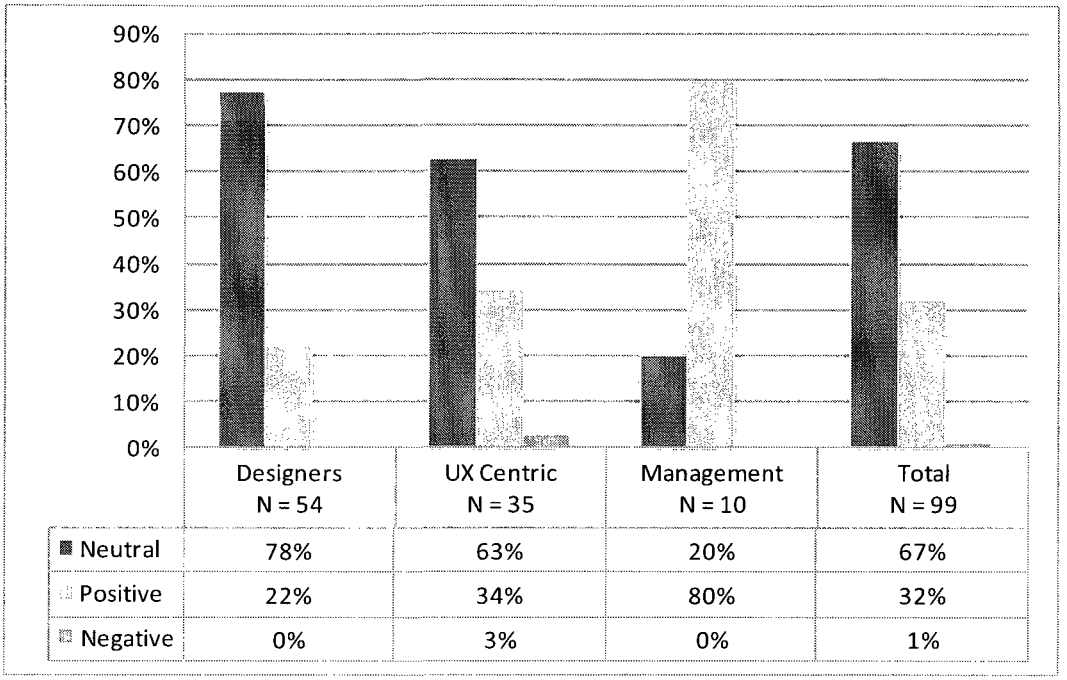
Together, these findings support the demarcation among job titles and relationship to UX research; in other words, typically professionals perform a consistent role relative to UX research and that role is defined by their job title type.

4.2.5.4: Reported success in the last UX research experience

The specific wording in the open-ended survey question asked respondents to consider the success of their last experience. As such, I coded responses specifically for mention of the word 'success' rather than trying to infer success in the descriptions. In all, 33 respondents reported some level of positive success; two

[25] Additionally, the role relative to UX research that was identified in the last experience question was significantly associated with the role that responders identified in part two of the survey, χ^2 (10, $N = 99$) = 21.00, $p < .05$.

reported a negative experience and the remainder did not include success in their description. There was a significant association between job title type and the report of success, χ^2 (4, N = 99) = 14.95, $p < .05$. While most responses were neutral in respect to success, Management and UX Centric jobs were more likely to report positive success than Designer job titles, see Figure 25.



	Designers N = 54	UX Centric N = 35	Management N = 10	Total N = 99
Neutral	78%	63%	20%	67%
Positive	22%	34%	80%	32%
Negative	0%	3%	0%	1%

Figure 25: Reported success in last UX research experience by job title type

I also investigated if reported success was associated with other designer profile variables (age, gender, and professional experience). No significant associations were found indicating that Designers were homogenous as a group in respect to the inclusion of success in their descriptions.

4.2.5.5: Summation of Last UX research experience responses

Analyzing the probe into respondent's last UX research experience, I found that those with Designer job titles were significantly less likely to include any methods that included end users in their description. Additionally, while not significant, they were still the least likely group to include the term 'user(s)' in their

responses or report success in their last experience. Finally, those in Designer job titles were most likely to report the role of 'user + creator/conductor' in their last experience whereas UX Centric and Management job respondents were more likely to report their role as a 'conductor/creator'. There was a significant association between how respondents described their role in UX research in part two of the survey and the role they described in their last experience which confirmed consistency of role relative to UX research between the two responses, χ^2 (10, N = 99) = 21.00, $p < .05$.

4.3: Discussion

Two important summative findings from the screening survey provided a framework for this investigation. First, exposure to UX research among respondents with Designer job titles is reliably predicted by professional experience in most cases. The more experience, the more likely a designer is likely to have UX research experience. This is important because other researchers have found that a lack of UX research exposure in the case of personas appears to be related to a reduced effectiveness in persona utility (Blomquist & Arvola, 2002; Rönkkö, 2005).

Second, there is a clear distinction among those who are typically tasked with conducting and creating user research materials (e.g, creator/conductor roles in UX Centric job titles) from those who are not (e.g. user roles in Designer job titles). This is supported by: (a) the inclusion of end users in their discussion; (b) what the professionals focused on in their job descriptions (i.e. methods involving users versus deliverables): (c) how professionals scored in respect to the Gould and Lewis probe; (d) how the professionals describe their roles relative to UX research (i.e. user versus creator/conductor); and finally (e) what professionals focused on in their last UX research experience (i.e. methods and success). This is an important finding because it supports a clear separation between those with Designer job titles from those with UX Centric job titles. This separation, then, emphasizes a need for

strong communication between the two groups whether it is facilitated by personas and scenarios or other means. In other words, this finding supports a need for those with UX Centric job titles to find ways that maximize their findings to those with Designer job titles. One key difference between the two groups was in the Gould and Lewis probe which I used to establish an HCD orientation alignment score for each responder. The HCD orientation alignment is described in greater depth in the next section (section 4.3.1).

4.3.1: Gould and Lewis revisited

Recall that Gould and Lewis asked their study participants to describe "*Three to five major steps you consider good practice for designing, developing and evaluating a new computer system for users.*" Utilizing a very liberal scoring method, each response was coded for (a) an early focus on users, (b) empirical testing with users, and (c) iterating design based on user input. I found that total adherence to the three principles improved from the author's original study twenty five years ago.

Gould and Lewis found that only 2% of their respondents included all three principles. I found that respondents from the screening survey improved on this percentage by a large amount. Inclusion of all three principles among the Designer job titles (Designer, Interaction Designer, Information Architect, Developer, and Writer) was at 17%; among the UX Centric job title responders at 41%; and finally 27% among the Management job titles. This improvement, however, was tempered by the percentage of respondents who did not mention any of the principles.

I found that about the same percentage as was found in the original Gould and Lewis study did not include any of the three principles in their response. Gould and Lewis reported that 26% of respondents did not include any of the principles. Among the UX Centric job titles, 18% did not include any of the principles. Among the Designer job titles 34% did not include any of the principles and among Management job titles 27% did not include any of the three principles. Together

these findings suggest that while the HCD message has gained penetration among the professions responsible for creating technology over the last twenty-five years, it appears HCD thinking is not yet commonplace, especially among those with Designer job titles and Management job titles.

Furthermore, there was no significant differentiation between adherence to the three principles and the profiles of those reporting Designer job titles. In other words, age, gender, specific job title and professional experience were not significantly associated with adherence to the three principles. This finding suggests there is no specific factor contributing to greater HCD awareness among Designers. Moving forward, I used the Gould and Lewis score to help establish HCD orientation alignment score.

4.3.1.1: Establishing the HCD orientation alignment score

In all, 158 respondents completed the Gould and Lewis query at a level that could be coded. Of the 158 respondents, most also completed the other two open-ended queries: 94% also completed the job responsibility query; 77% also completed the description of their last experience with user research. HCD orientation alignment scores were calculated by first using the GL score, which represented adherence to the three principles. One additional point was added to the final HCD orientation alignment score if a respondent mentioned 'user(s)' in any of the three open-ended questions on the screening survey. In all 63% of the 158 Gould and Lewis query respondents had also included 'user(s)' in one of the three open-ended queries. Scores were somewhat evenly distributed, ranging from 0-4 with a mean score of 1.97 (SD = 1.44), see Figure 26.

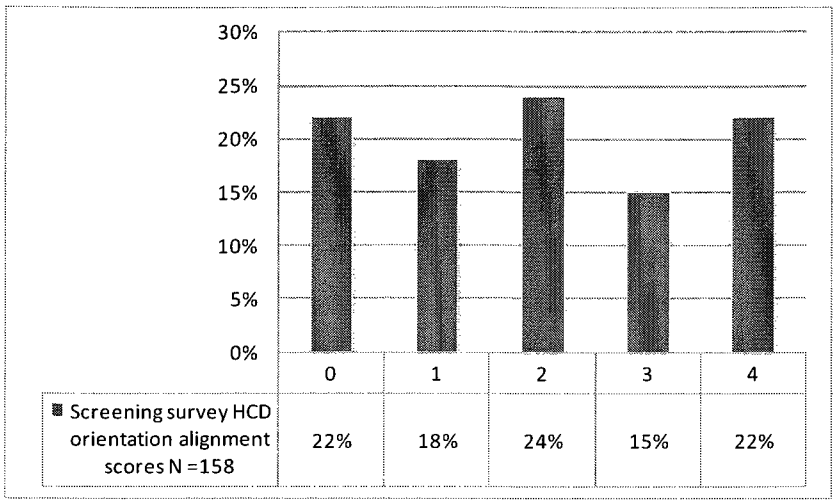


Figure 26: Distribution of HCD orientation alignment scores

4.4: Next Steps

Recall that the screening survey was conducted to establish s a pool of participants whose experience with UX research (including personas and scenarios) was known. The survey provided a range of professionals with Designer job titles in which potential designer-related influential variables were known. Variables included experience, gender, age, specific job title, persona/scenario exposure and HCD orientation. Participants for the exploratory design study were then selected to provide a range among these designer-related variables. The remaining screening survey respondents were sent a follow-up survey if they had claimed to have exposure to personas and/or scenarios. I detail my participant selection for each study in the next chapter.

Chapter 5 Methods: design study & follow-up surveys

In this chapter, I present the methods that were used for the exploratory design study and follow-up surveys in depth. Participant/responder recruitment and profile information are outlined first (section 5.1), followed by the design of the materials (section 5.2) and the procedures I used to conduct the exploratory design study and the follow-up survey (section 5.3). Lastly, I outline how the results are presented in Chapters 6 through 9 in section 5.4.

5.1: Participants

Participants for the exploratory design study and follow-up survey were selected from the respondents of the screening survey. Involvement in each study had four requirements. To be considered for either study, screening survey respondents had to have: (1) completed the Gould and Lewis query at a level that could be coded; (2) indicated an interest in participation; and (3) submitted contact information. In addition, for involvement in the exploratory design study, participants had to have reported a Designer job title and to be able to come to the University of Washington campus located in Seattle, Washington. Involvement in the follow-up survey additionally required report of previous exposure to personas and/or scenarios.[26]

Of the 158 respondents who completed the Gould and Lewis query in a meaningful way, nine did not want to participate in further studies, reducing the potential pool for the subsequent studies to 149 responders. Fifty-six responders fit the requirements for the design study and 95 qualified for follow-up surveys. Fifty-one qualified for both a follow up survey and the design study.

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[26] Recall that this exposure was not necessarily context scenarios. My intention was to screen study participants and follows up responders for their meaning of 'scenarios' by way of an operational definition that I had created which defined context scenarios..

5.1.1: Exploratory design study

In total, 19 participants were contacted for the exploratory design study. I sent respondents an email which thanked them for their previous participation and reminded them to redeem the $5.00 Amazon gift certificate from the screening survey if they had not already done so. The recruitment email also reminded responders that they would be compensated for the design study with an additional $75.00 Amazon gift certificate, and that the study would take about three hours at the University of Washington's Seattle campus. I included a list of potential dates and times for the study. If respondents did not contact me in a week, they were sent a reminder. If I did not hear back from the participants for another week, they were moved to the potential follow-up study recruitment pool if they qualified for the follow-up study.

Recruitment occurred over March and April of 2009. The final ten participants represented a range of Designer job titles, previous exposure to personas and scenarios, HCD orientation alignment scores, professional experience, age and gender. See Table 11 for details.

Table 11: Exploratory design study participant details

	Age	Gender	Job Title	Experience	HCD score	Persona exposure	Scenario exposure	Role Relative to UX Research
Particpant 01: ID **045**	36-40 years	Female	Information Architect	<7 years <10 years	0	Yes	No	User
Particpant 02: ID **087**	31-35 years	Male	Designer	<7 years <10 years	1	Yes	Yes	User
Particpant 03: ID **116**	25-30 years	Female	Developer	<2 years < 3 years	0	Yes	No	User
Particpant 04: ID **037**	51-55 years	Female	Designer	<10 years	2	No	Yes	User
Particpant 05: ID **030**	41-45 years	Female	Interaction Designer	<10 years	4	Yes	Yes	User
Particpant 06: ID **124**	36-40 years	Male	Developer	<10 years	4	No	No	No Experience
Particpant 07: ID **020**	18-24 years	Male	Designer	<3 years < 5 years	4	No	No	No Experience
Particpant 08: ID **168**	41-45 years	Male	Developer	<10 years	1	No	No	No Experience
Particpant 09: ID **56**	36-40 years	Male	Designer	<3 years < 5 years	2	No	No	User + Creator /Conductor
Particpant 10: ID **124**	25-30 years	Female	Designer	<2 years < 3 years	3	Yes	No	User + Creator /Conductor

5.1.2: Follow-up survey

Once the recruitment for the exploratory design study was complete, I selected participants for the follow-up survey from the remaining responder pool. In total, 75 screening survey respondents who met the requirements for the follow-up survey were sent recruitment emails. Respondents were sent different recruitment emails and links to slightly different surveys depending on how they answered the screening survey. Survey variants included:

- Survey 1a, sent to respondents who reported being 'users' of UX research, a Designer or Management job title and exposure to personas but not scenarios
- Survey 1b, sent to respondents who reported being 'users' of UX research, a Designer or Management job title and exposure to scenarios but not personas
- Survey 1c, sent to respondents who reported being 'users' of UX research, a Designer or Management job title and exposure to both personas and scenarios
- Survey 2a, sent to respondents who reported being 'creator/conductors' of UX research, a UX Centric or Management job title and exposure to personas only
- Survey 2b, sent to respondents who reported being 'creator/conductors' of UX research, a UX Centric or Management job title and exposure to scenarios only
- Survey 2c, sent to respondents who reported being 'creator/conductors' of UX research, a UX Centric or Management job title and exposure to both personas and scenarios
- Survey 3a, sent to respondents who reported being 'users + creators/conductors' of UX research, any job title and exposure to personas only

- Survey 3b, sent to respondents who reported being 'users + creators/conductors' of UX research, any job title and exposure to scenarios only
- Survey 3c, sent to respondents who reported being 'users + creators/conductors' of UX research, any job title and exposure to both personas and scenarios.

Respondents were told that the survey was split into two parts. Part one represented the main part of the survey which asked about personas and/or scenarios; part two was the IRI empathy test (see Chapter 3). The recruitment text for surveys 1a, 1b, 2a, 2b, 3a, and 3b read:

> "Part one should take no more than 15 minutes to complete and Part two should take no more than 10 minutes to complete. We will be offering a $10.00 gift certificate as compensation for completion of each part ($20.00 total). You are not obligated to complete part two to receive the gift certificate for part one completion. Additionally, you can save the link for part two and take it at a later date."

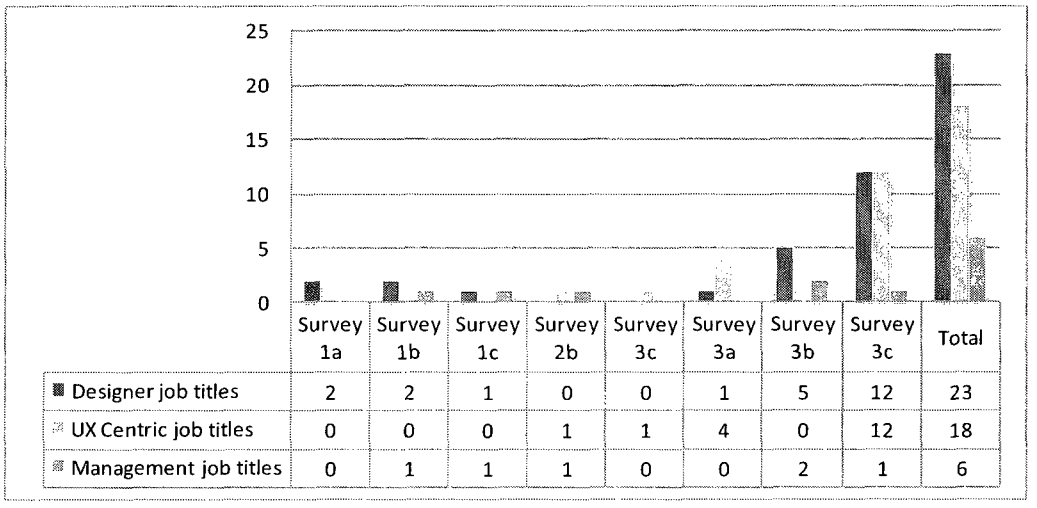
Respondents for surveys 1c, 2c and 3c were answering for both personas and scenarios; as such, the surveys were longer and the gratuity was greater. The recruitment text for surveys 1c, 2c and 3c read:

> "Part one should take no more than 20 minutes to complete and Part two should take no more than 10 minutes to complete. We will be offering a $15.00 gift certificate for completion of part one and $10.00 for the completion of part two ($25.00 total). You are not obligated to complete part two to receive the gift certificate for part one completion. Additionally, you can save the link for part two and take it at a later date."

More than half (63%, $N = 47$) participants who were sent a recruitment email completed the follow-up surveys. See Figure 27 for a breakdown of follow-up survey respondents by job title type.[27]

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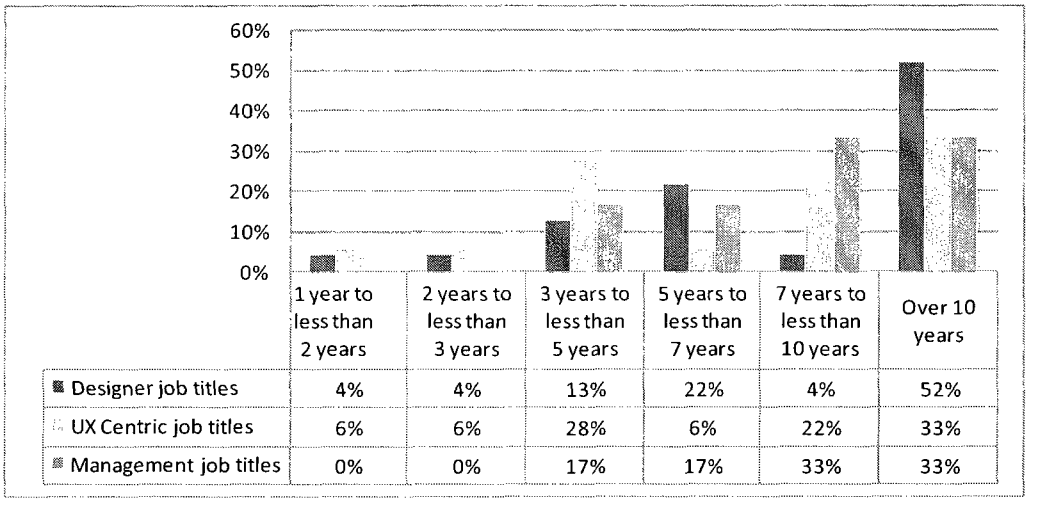
[27] There were no responders for surveys 2a and 2c. Almost all ($N = 46$) of the follow-up survey respondents also completed part two (the IRI empathy test).



	Survey 1a	Survey 1b	Survey 1c	Survey 2b	Survey 3c	Survey 3a	Survey 3b	Survey 3c	Total
Designer job titles	2	2	1	0	0	1	5	12	23
UX Centric job titles	0	0	0	1	1	4	0	12	18
Management job titles	0	1	1	1	0	0	2	1	6

Figure 27: Follow-Up survey respondents by job title type

Most follow-up survey respondents were from the highly experienced categories with 57% claiming at least seven years of professional experience, see Figure 28.



	1 year to less than 2 years	2 years to less than 3 years	3 years to less than 5 years	5 years to less than 7 years	7 years to less than 10 years	Over 10 years
Designer job titles	4%	4%	13%	22%	4%	52%
UX Centric job titles	6%	6%	28%	6%	22%	33%
Management job titles	0%	0%	17%	17%	33%	33%

Figure 28: Follow-up survey respondents, job title type by experience

Respondents were split almost evenly between male and female and followed a normal age curve with a majority (64%) between the ages of 31-45, see Figure 29.

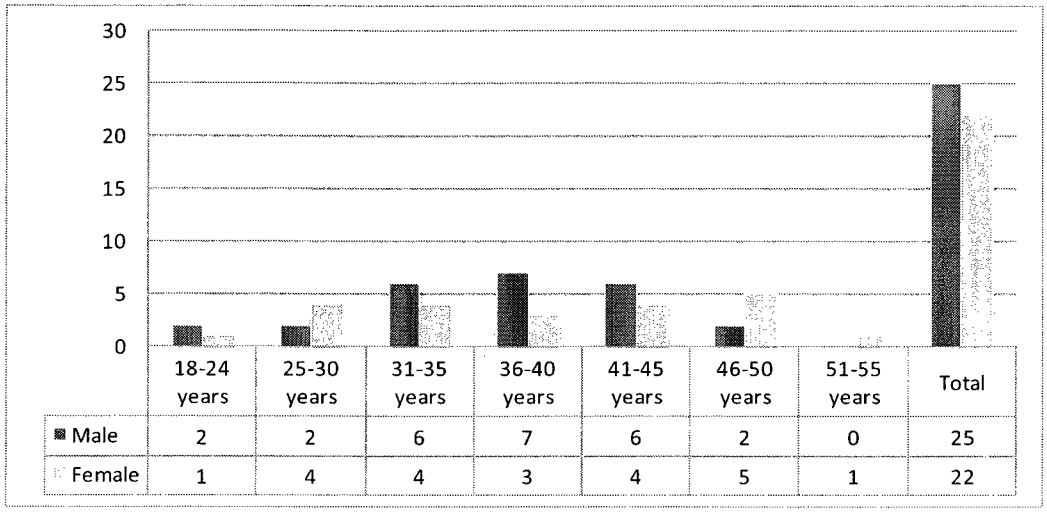


Figure 29: Follow-up survey respondents, gender by age

Respondents had higher HCD orientation alignment scores when compared to the overall scores from the screening survey. Whereas in the overall screening survey sample mean was 1.97 ($M = 1.97$ ($SD = 1.44$), in the follow-up respondents scored much higher, $M = 2.64$ ($SD = 1.41$. See Figure 30.

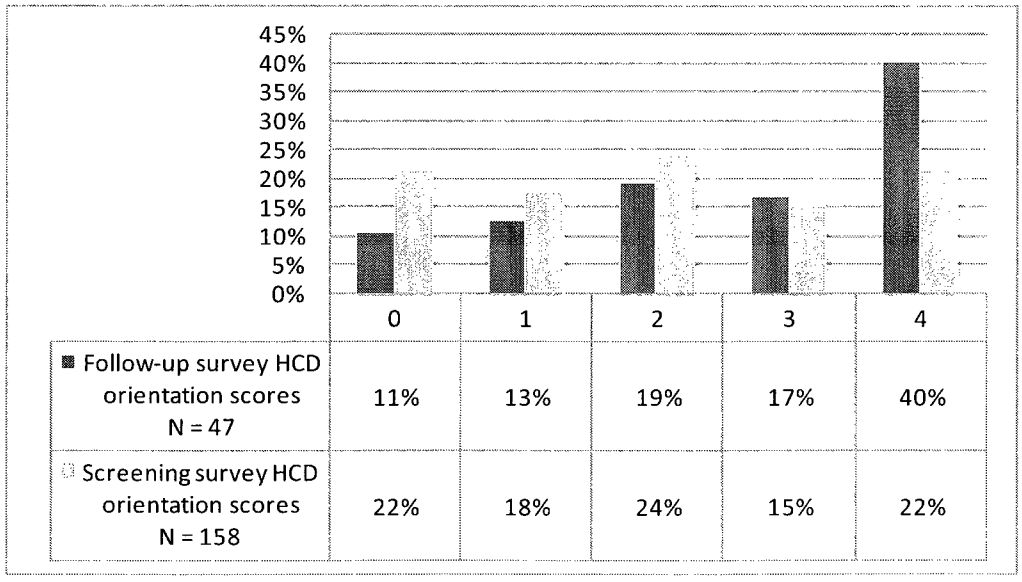


Figure 30: HCD orientation alignment score distribution

5.2: Materials and Design

There were multiple overlaps between the questions asked of the exploratory design study participants ($N = 10$) and the follow-up survey respondents (total $N = 47$, Designer job titles $N = 23$). Questions were designed to both establish the remaining moderator variables outlined in Chapter 3[28], and assess outcomes of persona and scenario use. The next sections discuss the design study materials (section 5.2.1) and the follow-up survey design (section 5.2.2).

5.2.1: Exploratory design study materials

Study participants were given research materials that included personas and context scenarios which summarized data about mobile phone users in Kyrgyzstan. How these materials were created is discussed in Appendix A and the complete set of study materials are presented in Appendix C. Additionally, participants were given: (1) a task definition sheet which explained both the design problem and how the problem was supported by research; (2) an information sheet about telephony that provided background information for the to-be-designed text-based interaction; (3) a fact sheet about Kyrgyzstan; and (4) a map showing where Kyrgyzstan was located in the world. Other materials included a budget and a project schedule.

5.2.2: Follow-up survey design

The surveys were created using the University of Washington's Catalyst survey tool, see Appendix D for the complete survey. After an introduction page, respondents were asked to give their consent to participate in the study. The remainder of the survey was split into two parts. The surveys were slightly different depending on the type, 1a,

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[28] Recall that the independent variables from the screening survey included, age, gender, job title, professional experience and HCD orientation alignment. Designer-related independent variables identified from the design study and follow up survey included designer empathy, self-identified cognition strategy, and the perception-related variables of (a) the education and background of the design research team, (b)sample size, (c)research methods used, (d) presentation mode, and (e) effect of distant audience The design study also identified domain and object expertise of a to-be-designed object. Exogenous independent variables explored were the effect of company support, time lines and budgets.

1b, 1c, 2a, 2b 2c, 3a, 3b, and 3c. Part one represented the main portion of the survey and part two was the IRI empathy test . The next sections describe the survey branching design of part one (section 5.2.2.1), the persona and scenario question portions of part one (section 5.2.2.2) and part two (section 5.2.2.3).

5.2.2.1: Part one a: branching design

The branching design is explained in the next sections (5.2.2.1a-d).

5.2.2.1a: Surveys 1a- 1c. In surveys 1a-1c, respondents had identified themselves as 'users' of UX research and reported Designer (or Management) job titles; as such, responders were first asked to identify their design cognition strategy. Respondents were asked their level of agreement to four statements:

- I spend a lot of time understanding the problem constraints of the design before I begin. (This represented a problem based strategy)
- I spend a lot of time focused on gathering information about what the design will need from external sources. (This corresponded to information driven strategy, the sub-variant of problem-based)
- I like to get to designing quickly, where I try work through solutions right away. (This characterized a solution-based strategy)
- I rely primarily on my prior knowledge to develop a solution and less on external sources. (This represented a knowledge driven strategy, the sub variant of solution-based).

Survey responders for 1a were then presented with the persona section, 1b respondents were presented with the scenario section, and 1c respondents were first presented the persona section followed by the scenario section.

5.2.2.1b: Surveys 2a- 2c. In surveys 2a-2c, respondents had identified themselves as 'conductor/creators' of UX research and had reported UX Centric or Management job titles. These respondents were first asked to narrow their identity which best described their role in relation to personas or scenarios. Choices included three possible roles and were specifically worded as:

- *Researcher,* Most of the time, I conducted the research (or was part of a team who conducted research) for the personas

- *Creator,* Most of the time, I created the personas (or was part of a team who created personas) from research conducted by others – or I did not use any research at all
- *Researcher and Creator,* Most of the time, I conducted BOTH the research (or was part of a team who conducted research) AND took part in the creation of the personas.

Next, 2a – 2c respondents were shown the same persona and scenario sections detailed above, but the questions were reworded to make sense for how they identified their role (i.e. user or creator/conductor).

5.2.2.1c: Surveys 3a- 3b. In surveys 3a and 3b respondents had identified themselves as 'users + conductor/creators' and could have reported any job title; as such, these respondents were not asked to identify their design cognition strategy. These respondents were first asked to narrow their identity from the three choices above (Researcher, Creator, Researcher + Creator) with the additional choice of User:

- *User,* Most of the time, I utilized personas created by others. Respondents who answered 'user' were routed to survey 1a or 1b depending on if they were answering for personas or scenarios. All of the other respondents were routed to survey 2a, 2b or 2c, again depending on of they were answering for personas, scenarios or both.

5.2.2.1d: Survey 3c. Finally, in survey 3c respondents were first asked to narrow their identity from the four choices (Researcher, Creator, Researcher + Creator, and User) in respect to their experience with personas. Researchers, Creators and Researcher + Creators were routed to survey 2a; Users were routed to survey 1a. Second, responders were asked to narrow their identity in respect to scenarios and then routed to the appropriate survey, either 1b or 2b. Most respondents were consistent in their roles relative to the two methods; of the 25 respondents, who completed follow-up survey 3c, ten (40%) switched roles between the persona method to the scenario method.

5.2.2.2: Part one b: persona and scenario sections

I describe the persona and scenario sections here from the 'User' perspective; however, these questions were reworded depending on how the respondent identified their relationship to UX research in the branching section described above. Additionally, I describe the sections here from the persona perspective; however the scenario section was identical to the persona section. It was simply reworded to ask about scenarios instead of personas. The persona and scenario sections each contained twelve sub sections.

The first subsection asked respondents an open-ended request for three things that came to mind when they thought about personas (or scenarios). Next, they were asked to identify how many projects they had used personas (or scenarios) over the last ten years.

Second, respondents were asked to report on their last experience using personas (or scenarios); this contained three open-ended questions and two rating scales. The open-ended questions asked: (1) to describe the project and how the personas (or scenarios) were presented; (2) to explain what made the personas (or scenarios) effective (or not) summarization of UX research; and (3) the type of information the personas (or scenarios) contained. The rating scales asked respondents to judge: (1) how effective they felt the personas (or scenarios) were at relating UX information; and (2) how supportive their company was of the use of personas (or scenarios) in their last experience.

Third, respondents who had identified their primary role as 'users' of personas (or scenarios) were asked to describe the content that was contained in the presentation of the documents. These responders were asked to reflect on what content they found useful and helpful to the design/development process and what content they found extraneous.

Fourth, respondents were asked to describe their best and worst experiences using personas (or scenarios) in two open ended questions.

Fifth, respondents were asked to provide their perceptions of the persona (or scenarios) claims. Specifically, they were asked to rate their agreement to five statements: (1) personas (or scenarios) help me have more empathy with the perspective of a user; (2) I have never been surprised by the depiction of a user described by a persona (or scenarios); (3) personas (or scenarios) help me focus on specific users; (4) personas (or scenarios) help me communicate better about users to other members of the design and development team; and (5) often, I find that personas (or scenarios) describe users that are exactly like I had imagined even before I was given any user research. Statements 2 and 5 were intended to identify perception that personas help Designers avoid ill-informed assumptions and stereotypes.

Sixth, an open-ended request was presented that asked responders to generate factors that affect the quality of personas (or scenarios). This question was intended to investigate what considerations were most salient to respondents.

Seventh, the survey asked about the perception of the importance of sample size through two questions: (1) About how many users do you think one should consult/survey/interview before creating personas (or scenarios)? (2) Is there a minimum number of users you think one should consult/survey/interview before creating personas (or scenarios)?

Eighth, respondents were asked an open-ended question about research methods. Respondents were asked to "describe how you think a researcher/research team should gather and analyze information to create personas (or scenarios)."

Ninth, the survey probed for transparency of methods by asking two questions. The first question asked respondents to rate how important they felt it was to understand how the personas (or scenarios) were created. There was also a space for respondents to add any thoughts they had about the importance of method transparency.

Tenth, the survey asked for information pertaining to the perception of presentation modes by asking three open-ended questions: (1) How have personas (or

scenarios) been presented to you in the past? (2) Describe how effective you feel the presentation methods you listed above were to your understanding of the personas (or scenarios)? (3) How do you think personas (or scenarios) should be presented to design team members to maximize their effectiveness?

The eleventh sub section asked questions that attempted to gauge the importance of knowing about the research team. Respondents were asked to rate "how important is it for you to know the researcher or research group's credentials, experience and/or education? They were also given an open-ended space to add any thoughts they had in regards to the importance of knowing the research team's background.

The last sub section asked questions which were intended to measure perception of the distant audience effect. The survey asked responders to rate the level of difference they felt exists between personas/scenarios which represented mobile phone users in Kyrgyzstan compared to office workers in Seattle. This was followed by an open ended question asking for their reflections of possible differences. The same two questions were then asked about teens with autism who were located in Seattle compared to office workers in Seattle. The second set of questions, about teens with autism, was intended to probe differences in the persona/scenario methods that were encountered by a psychological distance as opposed to a geographical distance.

In surveys 1c, 2c and 3c, subsections six through twelve combined the methods (personas and scenarios) in the questions. For example, in sub section seven the first question was phrased, "about how many users do you think one should consult/survey/interview before creating personas/scenarios?"

At the end of part one, respondents were asked to leave their email for the gratuity. I also asked their location to gauge the geographic homogeneity of the sample in respect to Kyrgyzstan. Finally, responders were shown a thank you page with a link to part two.

5.2.2.3: Part two

Part two of the follow-up survey was an online version of the 'Interpersonal Reactivity Index' (IRI), see Appendix G. The IRI was used to assign an empathy profile to study participants and survey respondents. Recall that the IRI is a 28-item self-report measure of empathy created by Mark Davis (1980) that uses a multidimensional approach to explore designers' empathy in this dissertation research. Davis (1983) contends that the IRI measures four separate aspects of empathy: (1) perspective-taking; (2) fantasy; (3) empathetic concern; and (4) personal distress.

5.3: Procedures

This section describes the procedures used to conduct the design study (section 5.3.1) and the follow-up surveys (section 5.3.2).[29]

5.3.1: Exploratory design study procedure

The exploratory design studies were conducted at the University of Washington's Seattle campus in the Laboratory for Usability Testing and Evaluation (LUTE lab) located on the fourth floor of Sieg hall in the department of Human Centered Design & Engineering (HCDE). The studies were conducted between April 4 and May 4 2009.

The LUTE lab has three areas: (1) a conference area that can sit up to sixteen people at a conference table; (2) a computer room for usability; and (3) a moderator area that is separated from the conference area by a partition (approximately six feet tall). The moderator area contains the equipment that controls the cameras in the lab. Participants completed the study at the conference room table. The study procedures detailed below were slightly modified after a single pilot study conducted in December of 2008. I detail those modifications in the following discussion.

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[29] Data coding procedures are discussed with the chapters in which the results are also reported (chapters six through ten).

Exploratory design study participants were first presented with a consent form, see Appendix C. The consent described the nature of the study and asked permission to video tape and audio tape the session. In a slight deception, participants were informed that they were going to be asked to create an interaction design for a project related to a research group on campus and that I was one of many moderators acting on behalf of the research group. All participants signed the consent form, at which time the audio and video recorders were turned on.

The study lasted about three hours over four sections: (1) preamble which lasted approximately 30 minutes (section 5.3.1.1); (2) design session which lasted approximately 90 minutes (section 5.3.1.2); (3) a debrief interview which lasted about 45 minutes (section 5.3.1.3); and (4) a closing in which participants were asked to reflect on their design cognition strategy and then asked to complete the online IRI survey on a laptop (section 5.3.1.4). The closing section took about 15 minutes.

5.3.1.1: Preamble

The preamble contained two sub sections: (1) introduction (section 5.3.1.1a); and (2) presentation of research materials (section 5.3.1.1b). All research materials are available in Appendix C.

5.3.1.1a: Introduction. I first reminded participants how they described their job responsibilities in the screening survey and then invited them to expand on their description. I next asked what they knew, if anything, about the people and culture of Kyrgyzstan. I then described think-aloud protocol which asks participants to speak their thoughts out loud.

I gave printed instructions for think-aloud protocol to the participants, and then I modeled think-aloud as I installed batteries in a flashlight. Participants were invited to practice think-aloud with a different flashlight and set of batteries. Participants were instructed to think-aloud as I presented the research materials to them. At this point, the research materials were not visible because they were stacked in a folder. The research

materials were removed from the folder and presented to the participants in steps described in the next section.

5.3.1.1b: Presentation of research materials. First, participants were presented with the task sheet describing a to-be-designed service targeted at mobile phone users in Kyrgyzstan. The service was described as a mobile social software (MoSoSo) directory aimed at ameliorating problems arising from a lack of easily accessible, reliable and free information about phone numbers (for more information about the service see Appendix A). Additionally, the task sheet detailed research which supported the concept, including a sharp upward trend in mobile phone use compared to other technologies and a strong reliance on face-to-face social networks in the region. The user requirements were presented in two phases; participants were instructed to focus on phase one. Participants were asked to focus on phase one because in the pilot study the participant was overwhelmed with the additional requirements in phase two. The user requirements were listed below.

Phase One:

- Allow users to create and join groups (to support social networks) via text
- Allow businesses to publicly advertise their information via text (note the system would be seeded with many existing businesses)
- Allow users to contribute and rate services on a shared list of recommendations for services either publically or to a group via text
- Allow users to retrieve recommendations or information from specific groups or from a public area via text.

Phase Two:

- Allow users to broadcast (push) or post (pull) information to a group via text
- Users can retrieve information from the service without using text.

In hopes of clarifying the task, I presented an additional information sheet describing the type of telephony system that would support the service; the sheet included a graphic of an older non-smart mobile phone. I explained that the graphic represented the extent of the user interface, in that the 'user interface' was text on an older type mobile phone. I elaborated by explaining that first system interaction would

involve users calling into the MoSoSo service. Next, the service would ask users how they wanted to interact with the service (at this point the choices would be one for voice and two for text). Participants were instructed to assume that for the sake of the design study users would choose two for text interaction which would result in a text message sent to the users' phone. This initial text message, then, was the first interaction between the user and the system that the participant needed to consider as part of their interaction design. They were asked if they had any questions about the task at this point.

Second, I handed the three personas presented in Appendices A and C to the participants.[30] The personas were labeled as user profiles to avoid any baggage that participants might have had with the term 'personas'. I asked the participants to read over the 'profiles' and give me their reflections.[31]

Third, the participants were handed the three context scenarios presented in Appendix C. The context scenarios were labeled "interactions with the service," again, to avoid assumptions the participants might have had to the term 'scenarios'. The participants were again asked to talk about their impressions.

At this point I gestured to the folder and told participants there were additional research materials inside that may or may not be helpful to their design. In the pilot study, the participant was clearly overwhelmed at the volume of available research materials. Learning from this, I did not pull out the remaining research materials one by one and ask them to reflect. Instead, I quickly summarized the contents. However, in every session I did pull out the map to indicate where Kyrgyzstan was located to help with context.

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[30] The three personas described: (1) Parxat, a middle-aged business owner whose primary motivation to own a phone was to make calls when he was away from home or work; (2) Shirin, a twenty-something social user whose primary motivation to own a phone was to receive calls at all times; and (3) Roza, a middle-aged mother and housewife who used her phone primarily as a replacement for a landline. See Appendix A for more information.

[31] The user requirements in phase 1 aligned to the Parxat and Shirin context scenarios. The user requirements in phase 2 aligned to the Shirin and Roza context scenarios.

I then asked participants if they had any questions about what was being asked of them. Once questions were answered, I asked participants to tell me what they thought the task included. All ten participants at this point indicated they had a fairly good understanding of the task. To conclude the preamble, I told participants that: (1) think-aloud was not required while they were performing the task; (2) that we were investigating how they solved the problem but we were not judging the quality of the solutions, that there was no right or wrong solutions[32]; and (3) that they had 90 minutes to complete the task but could take as little time as they wanted.

5.3.1.2: Task

The task portion of the study had three subsections: (1) design session (section 5.3.1.2a); (2) the design debrief (section 5.3.1.2b); and (3) the design discussion (section 5.3.1.2c).

5.3.1.2a: Design session. During the design session, participants were asked to create a text-based user interaction to a proposed mobile phone directory. At this time, I moved to a moderator area which was situated behind a partition. This left participants to work through the problem alone. The decision to move behind the partition was directly related to lessons learned in the pilot study.

In the pilot study, I remained in the conference portion of the lab[33] which encouraged the participant to talk to me as he worked through the problem. This resulted in two negative outcomes: (1) he interacted minimally with the research materials because he was talking to me; and (2) he would ask me direct questions about facts I knew were in the research materials. Since the objective of the study was to investigate how research materials were used (not how the problem was solved) I wanted to limit my interaction with participants in regards to questions that amounted

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[32] I consistently used 'we' instead of 'I' throughout the studies to minimize my personal involvement and to reinforce my role as one of many moderators.

[33] The LUTE lab was actually located in the Engineering Library building on the UW campus in December 2008. The LUTE lab was moved to Sieg hall in March 2009. However, the configurations of the labs were similar in that there was a conference area and a moderator area behind a partition.

to knowledge transfer. Additionally, I knew I would not be able to maintain consistency of knowledge transfer over ten sessions with ten different participants. To ameliorate this problem, participants were instructed that if they had questions to shout them out, but that for consistency between sessions there was a limit as to what I could answer.

5.3.1.2b: Debrief. After the completion of the design portion of the study, I conducted a debriefing interview. Participants were asked to rate their designs, describe what they would have done differently if given more time, explain which research materials were the most helpful to their design, and discuss what the most difficult thing about the task.

5.3.1.2c: Design discussion. Participants were asked to describe and explain their solution to me.

5.3.1.3: Post task interview

The post task interview was split into five sections: (1) I first asked about perceptions they had about past experiences using personas and scenario *only* of those participants who had claimed to have used personas/scenarios in the screening survey (section 5.3.1.3a); (2) explicit claim agreement (section 5.3.1.3b); (3) perception-related variables (section 5.3.1.3c); (4) implicit claim agreement (section 5.3.1.3d); and (5) distant audience effect (section 5.3.1.3e). Methods for each are explained in the following sections.

5.3.1.3a: Perceptions about experiences with personas and scenarios. At this point the interview shifted gears and followed a format similar to the follow-up surveys. There were nine subsections to this portion of the interview. I began by asking all ten participants to tell me 'the first three things that come to mind' when they think about personas; the same question was asked in regards to scenarios.[34]

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[34] Note that this is the first time the words persona and scenario were used unless the participant had used the terms earlier. I only reported findings for those participants who had claimed on the screening survey that they had past experience with personas and/or scenarios.

Following the 'first three things' question, I asked all participants if they could identify any of the research materials as either 'personas' or 'scenarios'. All ten participants, including those with no previous persona/scenario experience, identified the documents at this point. I asked this question here to confirm that we were discussing the same thing moving forward.

Second, I explored previous experience with personas and scenarios for those participants who had identified previous exposure in the screening survey. If they had past experience with the methods, I asked participants to discuss the last experience. If they had more than one previous experience, I also asked about participants best and worst experiences.

5.3.1.3b: Explicit persona/scenario claim agreement: Third, I investigated explicit levels of agreement to the persona/context scenario claims.[35] Participants were asked, on a scale from 1-5, how much they agreed that personas/context scenario use led to greater empathy with users, increased communication about users, and a clearer focus of who users were. This was followed by a question which attempted to measure the persona ability to help Designers overcome existing ill-informed assumptions and stereotypes in which participants were asked their level of agreement to a statement that read "personas describe users that are exactly like I had imagined before I ever saw any user research." This was followed by a request for participants to generate what factors they thought affect the quality of personas and scenarios.

5.3.1.3c: Perception-related independent variables: Fourth, the perceived importance of sample size was investigated through two questions: (1) I asked participants to estimate how many end users they felt one should consult/survey/interview before creating documents like the personas and context scenarios that they were given for the task; (2) I asked if there was a minimum number.

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[35] However, I only reported findings from those participants who had multiple past persona experiences.

Fifth, the perceived impact of understanding the methods used by the research team was explored. First, by asking what types of methods should be used; I gave examples of surveys, interviews and focus groups. Next, I presented two hypothetical situations in which I asked what they would think about the following statements:

- These personas and scenarios were created using multivariate statistical analysis and the results were statistically significant. What do you think?
- These persona and scenarios were created by analyzing interview protocol and probing for patterns in the responses. The patterns were independently verified by two researchers. What do you think?

Sixth, the perceived effect of presentation was examined by first asking participants to reflect on the presentation of the personas and context scenarios they were given for the task; how could they be improved? I then presented up to three hypothetical presentation forms that have been used by other researchers which included: (1) dramatic short play; (2) life size posters; and (3) action figures.

Seventh, the perceived importance of knowledge about the research group was investigated. I asked if they wanted to know the research team's background and presented three hypothetical credentials for their impressions:

- If I were to say that these personas and scenarios were created by a group led by a cognitive psychologist with a PhD and 20 years of experience in UX research
- If I were to say that these personas and scenarios were created by a single interaction designer with 10 years experience in design and a PhD
- If I were to say that these personas and scenarios were created by a group of Masters Students.

5.3.1.3d: Explicit persona/scenario claim agreement. Eighth, perception of persona/scenario claims was examined *without* explicitly asking about the claims. The procedure for each is detailed below:

- *Stereotype avoidance / assumption alignment.* I asked participants to reflect on the initial assumptions and whether the UX research altered these assumptions by asking:

  - Were your initial assumptions about people from Kyrgyzstan confirmed by the personas and scenarios?
  - Were you at all surprised about what you learned about mobile phone users from Kyrgyzstan – which documents surprised you more?
  - Discuss how your initial assumptions changed or were confirmed.

- *Greater empathy:* I explored if participants bridged the gap with the Kyrgyz users. In other words, I examined if participants could get inside users' heads; understand their motivations, feelings and ideas, etc. I presented the following questions:
  - Roza does not drive, and relies on a network of local mini-buses. There is no published bus schedule and often, if a bus is full, it will not even stop. Can you talk about what challenges she might face getting to town for a scheduled meeting?
  - What kinds of solutions do you think could help Roza?
  - Do you think that Parxat, Shirin or Roza would enjoy travel? If so, where do you think they would like to go?
  - On a scale of 1-5 (5 being the most confident), how confident do you feel about your answer?

- *Increased Communication:* In this probe, I investigated if participants had an understanding of the targeted users, at least enough to discuss (communicate about) facts about the personas (i.e. did they construct a mental model of the targeted users?) I asked the following:
  - Without referring back to the personas, can you tell me how often each of them use text?
  - On a scale of 1-5 (5 being the most confident), how confident do you feel about your answer?
  - Without referring back to the personas, how often does each use the Internet?
  - On a scale of 1-5 (5 being the most confident), how confident do you feel about your answer?
  - Which documents helped you more in understanding these technical facts about the users?

- *Increased focus:* For this probe, I explored whether participants were focusing on the needs of the users presented as personas. I asked:

- What considerations did you make specifically for Parxat in your design? Shirin?

5.3.1.3e: Distant audience effect. Finally, in the last section of the debrief interview, I explored the distant audience effect. I asked participants to reflect on any differences they might think exist between the personas and context scenarios they were given for the task and if they were hypothetically given personas and context scenarios representing office workers in Seattle. I asked for the same comparison to be made for personas and context scenarios representing teens with autism who lived in Seattle versus office workers in Seattle.

5.3.1.4: Exploratory design study closing

In the final section of the study, I presented four note cards to the participants, each with a design cognition strategy and asked which strategy they felt best described them. The statements on the cards read:

- I spend a lot of time understanding the problem constraints of the design before I begin. (This represented a problem based strategy)
- I spend a lot of time focused on gathering information about what the design will need from external sources. (This corresponded to information driven strategy, the sub-variant of problem-based)
- I like to get to designing quickly, where I try work through solutions right away. (This characterized a solution-based strategy)
- I rely primarily on my prior knowledge to develop a solution and less on external sources. (This represented a knowledge driven strategy, the sub variant of solution-based).

Finally, participants were asked to take the online version of the IRI empathy test. I instructed participants that they did not need to answer any questions if they were uncomfortable. Once they completed the IRI, I walked them to where they felt comfortable returning to their car and reimbursed them for any parking costs.

5.3.2: Follow-up study procedure

Initial emails with links to the follow-up surveys were sent to qualifying participants on April 14, 2009. The emails reminded potential responders about the

gratuity and asked that the surveys be completed within two weeks. Reminder emails were sent May 1, 2009 to those who had not yet responded informing potential respondents that the surveys would remain open for another week. See Appendix F for the text of the recruitment emails. The surveys were closed on May 8, 2009.

5.4: Results outline (next steps)

I report the data analysis procedures and results from the design study and follow-up surveys in Chapters 6 though 10. Recall that the screening survey established some designer-related moderator variables: (a) designer profile independent variables (age, gender, job title and professional experience); and (b) an HCD orientation alignment score was established for each survey respondent and study participant. Remaining variables are explored in the following chapters:

- Chapter 6 reports additional findings that explored some remaining designer-related moderator variables including empathy, design cognition strategies, HCD orientation with the method (i.e. how many projects participants and responders had using persona and scenarios), and levels of domain and object expertise
- Chapter 7 describes how the personas and context scenarios were used in the design study
- Chapter 8 explores findings about past personas and scenario experiences from the survey respondents and the design study participants
- Chapter 9 describes the findings pertaining to perception related variables
- Chapter 10 presents summative findings pertaining to the claims and criticisms related to persona and scenario use.

Chapter 6 Results: Designer-related variables

I report on four designer-related moderator variables in this chapter. These variables provided a lens through which the design study participants' findings are discussed in Chapter 7. Designer-related moderator variables included: (1) empathy (section 6.1); (2) self identified design cognition strategies (section 6.2); (3) the number of experiences Designers reported in which they had used personas and scenarios (experience dimension of HCD orientation, section 6.3); and (4) design study participants' expertise with designing text interactions for mobile phones (object expertise) and their experience with the targeted Kyrgyz audience (section 6.4). Some domain expertise (electronic interaction design) was assumed for all participants. In section 6.5, I preview the next steps of the dissertation.

6.1: Empathy

Recall that I measured empathy by using the 'Interpersonal Reactivity Index' (IRI) which is a 28-item self-report measure of empathy created by Mark Davis (1980). The instrument uses a multidimensional approach and claims to measure four separate aspects of empathy: (1) perspective taking; (2) fantasy; (3) empathetic concern; and (4) personal distress.

The perspective taking (PT) measure is considered the most intellectual response of the four measures. It evaluates the tendency to adopt the psychological viewpoint of another. Fantasy (FS), considered a mild emotional response, describes tendencies to transport one's self imaginatively into the feelings of fictitious characters from books, movies and plays. Empathetic concern (EC), considered an emotional response, gauges levels of sympathy and concern for another in an unfortunate situation. Finally, personal distress (PD), the most emotional response, appraises feelings of personal anxiety and unease in response to a tense situation involving other people. See Appendix G for a complete IRI questionnaire.

Survey respondents were given the option to complete the IRI after the follow-up survey. Study participants were asked to complete the IRI at the end of the exploratory design study. The results from both studies were combined for analysis. In the next sections I describe the data analysis procedures (section 6.1.1), the findings (section 6.1.2) and a summary of the findings (section 6.1.3).

6.1.1: Data analysis procedures

In the IRI questionnaire, respondents were asked to rate their level of agreement to 28 statements on a scale of 0-4 where 0 did not describe the respondent well and 4 described the respondent very well. Statements were phrased both in the positive and negative. For example, a positive question of fantasy (FS) read, "I daydream and fantasize, with some regularity, about things that might happen to me," versus a negatively phased statement which read, "Becoming extremely involved in a good book or movie is somewhat rare for me." Dimensions PT, FS and PD each had two negatively phrased statements, while EC had three.

Since the IRI was intended to measure four underlying empathetic dimensions (PT, FS, EC and PD), I first investigated correlations among the seven items in each dimension[36] and the overall score for that dimension. Next, I isolated the study participants and survey respondents with Designer job titles (Developer, Interaction Designer, Information Architect, Designer and Writer) from the survey respondents with UX Centric job titles (Usability Specialist, UX Architect, and UX Researcher) and compared their scores on the four empathy dimensions through a two group t-test. I also ran univariate tests to explore if any of the empathy dimension scores were associated with other designer profile variables that had been established in the screening survey: gender, age, and professional experience and HCD orientation

[36] Ideally factor analysis would be used for data reduction to analyze if the variables could be distilled into the four underlying dimensions. However, with a small sample size ($N = 57$) correlation coefficients tend to be unreliable making factorial analysis untenable in this situation. Tabachnick and Fidell (2007) write that "as a general rule of thumb, it is comforting to have at least 300 cases for factor analysis."

alignment score. Finally, I established mean scores for each Designer job title so I could assess how the design study participants compared to the overall means for their job title group.

6.1.2: Findings

This section describes the correlation and descriptive findings for each empathy dimension (sections 6.1.2.1-6.1.2.4), the job title type comparison (between Designers and UX Centric, section 6.1.2.5), associations among the overall empathy dimension scores and previously established designer-related independent variables (age, gender, professional experience and HCD orientation alignment score, section 6.1.2.6), and the mean score of each empathy dimension for the five Designer job titles (section 6.1.2.7).

6.1.2.1: Perspective taking (most intellectual response): correlations and descriptive findings

The overall mean for the perspective taking dimension ($N = 56$) was 16.4 ($SD = 2.9$); scores ranged from 8 to 25 out of a possible 28 points. Since the final score is comprised of adding the individual statements, it would be assumed that there would be a significant correlation between the final score and the scoring for each statement; all statements were significantly associated with the overall score indicating that all the measures are well represented in the score (see column 1 in see Table 12).

Table 12: Perspective statement correlations

	M	*(SD)*	*n*	1.	2.	3.	4.	5.	6.	7.	8.
1.PT Overall Score	16.4	*(2.9)*	56	--							
2. PT1_Negative	1.4	*(1.2)*	56	.27 *	--						
3. PT2_Positive	2.9	*(0.7)*	56	.27 *	-.41 **	--					
4. PT3_Positive	2.5	*(1.0)*	56	.57 **	-.44 **	.36 **	--				
5. PT4_Negative	1.8	*(0.9)*	56	.40 **	.54 **	-.39 **	-.13	--			
6. PT5_Positive	2.9	*(0.7)*	56	.52 **	-.11	.54 **	.49 **	-.11	--		
7. PT6_Postive	2.4	*(1.0)*	56	.54 **	-.29 *	.21	.60 **	-.20	.14	--	
8. PT7_Positive	2.6	*(0.8)*	56	.64 **	.29 *	-.08	.09	.38 **	.05	.27 *	--

* $p < .05$, ** $p < .01$

Statements PT2 ("I try to look at everybody's side of a disagreement before I make a decision.") and PT5 ("I believe that there are two sides to every question and

try to look at them both") had the highest level of agreement with a mean of 2.9. Statement PT1 ("I sometimes find it difficult to see things from the other guy's point of view") had the lowest level of agreement with a mean of 1.4. The negative statements (PT1 and PT4) had a lower level of agreement than the positive statements.

6.1.2.2: Fantasy (mildly emotional response): correlations and descriptive findings

The overall mean for the fantasy dimension ($N = 55$) was 14.7 ($SD = 3.1$); scores ranged from 9 to 24 out of a possible 28 points. All of the statements were significantly correlated with the overall score except for statement FS1 ("I daydream and fantasize, with some regularity, about things that might happen to me"). This indicated that statement FS1 was not as reliable of an indicator of the overall Fantasy score compared to the other statements, see Table 13. In fact, statement FS1 is only significantly correlated with statement FS7 ("When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me").

Table 13: Fantasy statement correlations

	M	*(SD)*	*n*	1.	2.	3.	4.	5.	6.	7.	8.
1. FS Overall Score	14.7	*(3.1)*	55	--							
2. FS1_Positve	2.6	*(0.9)*	55	.26	--						
3. FS2_Positive	2.8	*(1.0)*	55	.45 **	.23	--					
4. FS3_Negative	1.4	*(0.9)*	55	.31 *	-.20	-.31 *	--				
5. FS4_Negative	1.3	*(1.2)*	55	.33 *	-.08	-.45 **	.54 **	--			
6. FS5_Positive	2.2	*(1.1)*	55	.61 **	-.10	.41 *	-.03	-.02	--		
7. FS6_Postive	2.3	*(1.0)*	55	.65 **	-.17	.32 *	.06	.01	.53 **	--	
8. FS7_Positive	2.1	*(1.0)*	55	.44 **	.27 *	.32 *	-.18	-.18	.06	.19	--

* $p < .05$, ** $p < .01$

The highest level of agreement was to statement FS2 ("I really get involved with the feelings of the characters in a novel") with a mean of 2.8.The lowest level of agreement was to statement FS4 ("Becoming extremely involved in a good book or movie is somewhat rare for me") with a mean of 1.3. Again, the two negative statements (FS3 and FS4) had the lowest level of overall agreement.

6.1.2.3: Empathetic concern (emotional response): correlations and descriptive findings

The overall mean for the empathetic concern dimension ($N = 55$) was 14.7 ($SD = 3.1$); scores ranged from 12 to 24 out of a possible 28 points. All of the statements except statement EC3 ("When I see someone being taken advantage of, I feel kind of protective towards them") were significantly associated with the overall score. This indicates that EC3 was not as reliable of an indicator of the overall empathetic concern score, see Table 14. However, EC3 was significantly associated with EC1, EC4 and EC5.

Table 14: Empathetic concern statement correlations

	M	*(SD)*	*n*	1.	2.	3.	4.	5.	6.	7.	8.
1. EC Overall Score	15.9	*(2.4)*	55	--							
2. EC1_Positive	2.9	*(0.6)*	55	.30 *	--						
3. EC2_Negative	1.8	*(1.2)*	56	.43 **	-.05	--					
4. EC3_Positive	2.8	*(0.8)*	56	-.08	-.31 **	-.23	--				
5. ED4_Negative	1.9	*(1.0)*	56	.47 **	.02	.61 **	-.43 **	--			
6. EC5_Negative	1.3	*(0.9)*	56	.51 **	-.07	.22	-.32 **	.48 **	--		
7. EC6_Postive	2.8	*(1.0)*	56	.41 **	.40 **	-.25	-.01	-.30 *	-.22	--	
8. EC7_Positive	2.4	*(1.0)*	56	.42 **	.04	-.46 **	.17	-.38 **	.12	.50 **	--

* $p < .05$, ** $p < .01$

The highest level of agreement was to statement EC1 ("I often have tender, concerned feelings for people less fortunate than me") with a mean of 2.9. The lowest level of agreement was to statement EC5 ("When I see someone being treated unfairly, I sometimes don't feel very much pity for them") with a mean of 1.3. As with the other dimensions, the negative statements (EC2, EC4 and EC5) had the lowest level of overall agreement.

6.1.2.4: Personal distress (highly emotional response): correlations and descriptive findings

The overall mean for the personal distress dimension ($N = 55$) was 13.9 ($SD = 3.3$); scores ranged from 8 to 24 out of a possible 28 points. All of the statements were significantly associated with the overall score except PD3 ("When I see someone get hurt, I tend to remain calm") and PD 5 ("I am usually pretty effective in dealing with

emergencies"), both of which are negatively scored statements. In fact, both statements PD3 and PD5 were not significantly associated with any of the other statements in the dimension; as such I eliminated these statements from any further evaluation. Consequently, I calculated a new overall PD score comprised of the remaining statements; the recalculated overall mean was 8.9 (*SD* = 3.5).

Table 15: Personal distress statement correlations

	M	*(SD)*	*n*	1.	2.	3.	4.	5.	6.	7.	8.
1. PD Overall Score	13.9	*(3.3)*	55	--							
2. PD1_Positive	1.9	*(1.1)*	56	.70 **	--						
3. PD2_Positive	2.1	*(1.1)*	56	.39 **	.15	--					
4. PD3_Negative	2.2	*(1.1)*	56	.25	.03	-.12	--				
5. PD4_Positive	1.9	*(1.2)*	56	.48 **	.32 *	.31 *	-.03	--			
6. PD5_Negative	2.8	*(0.8)*	56	-.14	-.19	-.24	-.01	-.09	--		
7. PD6_Postive	1.5	*(1.1)*	56	.61 **	.36 **	.05	.01	-.06	-.37 **	--	
8. PD7_Positive	1.5	*(1.2)*	55	.65 **	.36 **	.00	-.03	-.03	-.26	.85 **	--

* $p < .05$, ** $p < .01$

After eliminating PD3 and PD5, the highest level of agreement was to statement PD2 ("I sometimes feel helpless when I am in the middle of a very emotional situation") with a mean of 2.1. The lowest level of agreement was to statements PD6 ("I tend to lose control during emergencies") and PD7 ("When I see someone who badly needs help in an emergency, I go to pieces") with a mean of 1.5 each. Although eliminated from further evaluation, in this case the negative statements (PD3 and PD5) had the highest levels of overall agreement.

6.1.2.5: Job title type comparison

Next I compared job title types. Respondent and study participants with Designer job titles ($N = 33$) had higher overall scores in all empathy dimensions compared to those with UX Centric job titles ($N = 18$). The differences were significant at the .10 level for both empathetic concern, $t\ (48) = 1.95$, $p = .057$, and personal distress, $t\ (48) = 1.71$, $p = .093$. Note that these are two most emotional dimensions, see Figure 31.

All respondents scored highest in perspective taking (the most intellectual) and lowest in personal distress (the most emotional) even before removing the two

unreliable PD statements from the evaluation (obviously the mean is lower without the statements). However, empathetic concern which is considered an emotional response scored higher in both groups than fantasy which is considered a mildly emotional response. Based on these findings, it appears that Designers are more empathetic in all dimensions than their UX Centric counterparts especially when considering the more emotional dimensions.

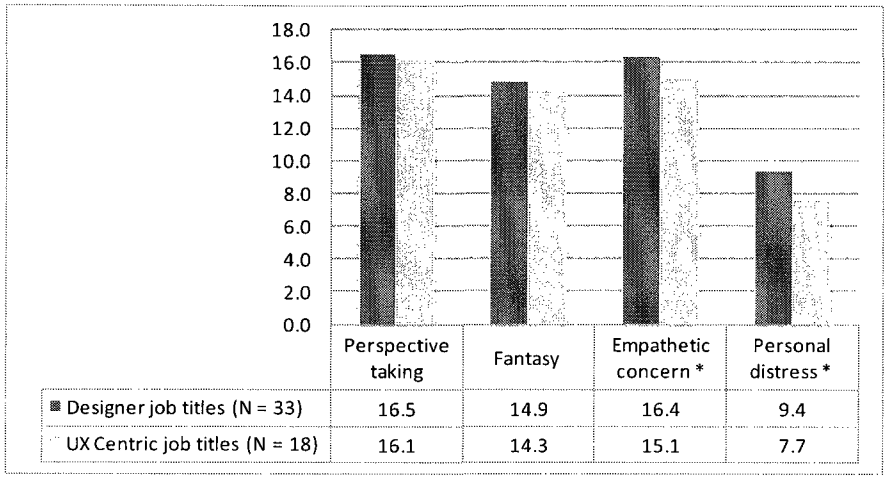


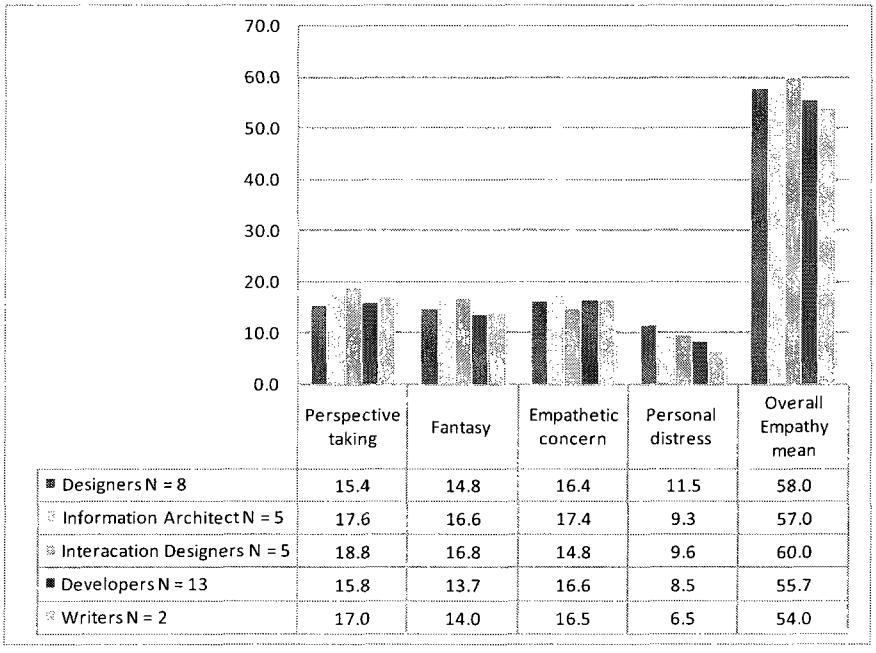
Figure 31: Empathy dimensions between job title types

6.1.2.6: Associations between empathy dimensions and other designer profile variables

Isolating only Designers ($N = 33$) from the exploratory design study and follow-up surveys, I conducted univariate tests to explore if any other designer-related moderator variables that had been established (age, gender, job title, professional experience and HCD orientation alignment score) were significantly associated with any of the empathy dimensions. Only gender was close to a significant association to any to the empathy dimensions. In regards to perspective taking (the most intellectual response) males scored higher ($N = 21$, $M = 17.3$, $SD = 3.3$) than females ($N = 12$, $M = 15.1$, $SD = 3.1$). This difference was significant at the .10 level, $t\,(31) = 1.92$, $p = .064$. These findings indicate that as a group, Designers are somewhat homogenous in their empathetic profiles.

6.1.2.7: Job title mean scores

While the findings above indicated that Designers were somewhat homogenous as a group in regards to their empathetic profile, I further analyzed differences among specific Designer job titles for descriptive purposes. Interaction Designers ($N = 5$) scored the highest in perspective taking while Writers ($N = 2$) scored the lowest. Interaction Designers also scored the highest in the fantasy empathetic dimension while Developers ($N = 13$) scored the lowest. Information Architects ($N = 5$) scored the highest in empathetic concern and Interaction designers scored the lowest. Finally, Designers ($N = 8$) scored much higher in personal distress (the most emotional dimension) compared to all other groups. As a group, Interaction Designers had the highest overall mean and Writers had the lowest, see Figure 32.



	Perspective taking	Fantasy	Empathetic concern	Personal distress	Overall Empathy mean
Designers N = 8	15.4	14.8	16.4	11.5	58.0
Information Architect N = 5	17.6	16.6	17.4	9.3	57.0
Interacation Designers N = 5	18.8	16.8	14.8	9.6	60.0
Developers N = 13	15.8	13.7	16.6	8.5	55.7
Writers N = 2	17.0	14.0	16.5	6.5	54.0

Figure 32: Empathetic dimensions among Designer job titles

6.1.3: Summary: empathy dimensions

Respondents in all job title groups scored the highest in the most intellectual response (perspective taking), followed by empathetic concern which is considered an emotional response. Study participants and survey respondents with Designer job titles

scored higher in all empathy dimensions compared to survey respondents with UX Centric job titles. Furthermore, when comparing job title types, the Designers group scored significantly higher at a .10 level on the two most emotional dimensions (empathetic concern and personal distress). Among other designer profile variables (age, gender, job title professional experience and HCD orientation) only gender appeared to be mildly associated with the perspective taking (most intellectual dimension); males scored higher than females. Finally, while not statistically significant, there were trends among job titles. Interaction Designers scored the highest overall but accumulated those points in the most intellectual empathy dimensions whereas Designers accumulated much of their score from the more emotional dimensions.

6.2: Design cognition strategies

All study participants and those survey respondents who had identified their roles as a 'user' of personas/scenarios were asked to reflect on their own design strategy. Study participants were presented with four statements and were asked to identify which statement most accurately described their design strategy. Survey participants were asked to rate their level of agreement (ranging from 1-5) to the four statements.[37]

The statements were presented as follows:

1. I spend a lot of time understanding the problem constraints of the design before I begin
2. I spend a lot of time focused on gathering information about what the design will need from external sources (by external sources we mean a source other than yourself)
3. I like to get to designing quickly, where I try to work through solutions right away

---

[37] In retrospect, this was not the best way to ask the question. Unfortunately, nine respondents had high levels of agreement to more than one statement. In an attempt to identify the statement that respondents felt described them best, I sent an email asking these respondents for clarification. Five respondents returned the email; the remaining four responses were eliminated from further analysis.

4. I rely primarily on my prior knowledge to develop a solution and less on external sources (by external sources we mean a source other than yourself).

Item one represented a problem-driven strategy, and item two represented the problem-driven strategy sub-variant of information-driven. Item three represented a solution-driven strategy, and item four represented the sub-variant knowledge-driven strategy. In the next sections, I describe the data analysis procedures (section 6.2.1), findings (section 6.2.2) and a summary of findings (section 6.2.3).

6.2.1: Data analysis procedures

The data from the exploratory design study participants ($N = 10$) and the survey respondents with Designer job titles ($N = 10$) were combined and explored descriptively. Next, I combined the problem-driven strategies (items one and two above) and the solution driven strategies (items three and four above). I conducted non parametric univariate tests[38], to investigate if self identified design strategy (2 groups) was associated with (1) the empathy dimensions; (2) designer professional profile (experience and job title); (3) designer personal profile (age and gender); and (4) HCD orientation alignment score.[39]

6.2.2: Findings

The ten design study participants ($N = 10$) were evenly divided between identifying their design cognition approach as problem-driven and solution- driven. Most of the survey respondents (70%) identified their approach as problem-driven, see Figure 33.

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[38] I used a Mann-Whitney U test for analyzing the empathy scores, professional experience, and age. This non-parametric test was chosen because the sample size was only $N = 20$; sample sizes under 30 are generally not considered large enough for parametric tests (Salkind, 2004). I used Chi-square tests for the remaining analyses.

[39] To avoid Type I error I used a Bonferroni adjusted alpha for each of the four constructs when needed.

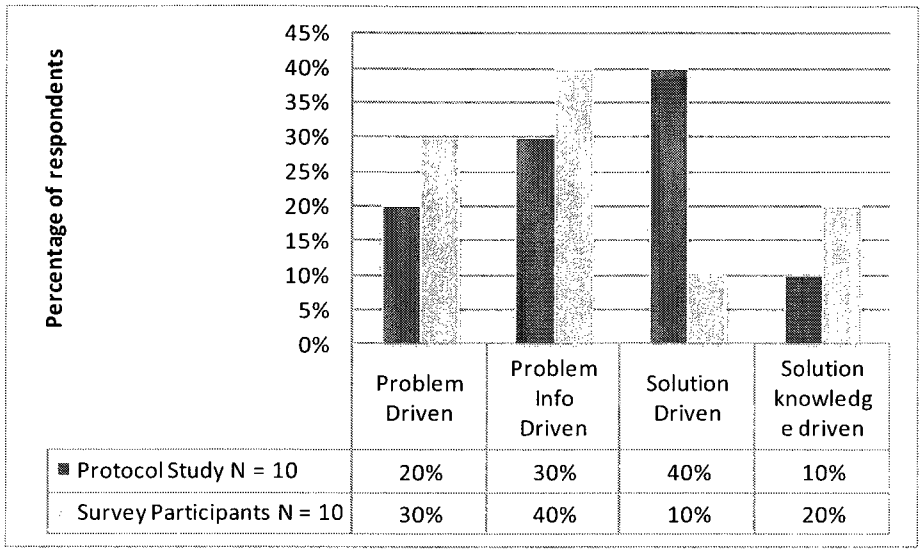


Figure 33: Problem solving strategies

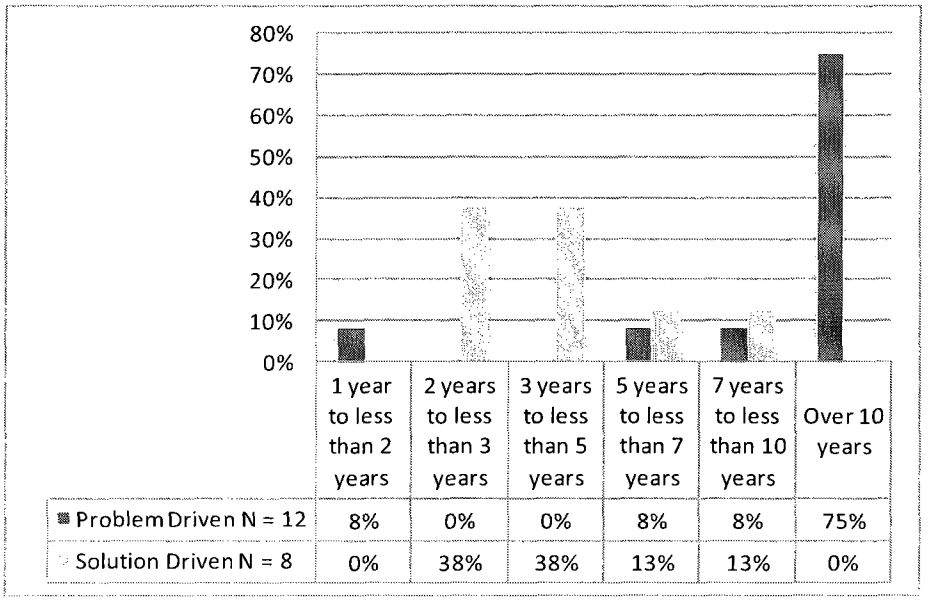
6.2.2.1: Empathy dimensions

There was no significant association between the design cognition approach groups and the four empathy dimensions; however, there was a large difference in the personal distress (PD) scores. Those who identified their strategy as problem-driven had a lower mean ($M = 9.3$) than the solution-driven group ($M = 10.6$) in personal distress. While the difference was not significant at a reduced Bonferroni adjustment for the empathy construct ($p = .0125$), it was significant at a much higher .10 level, U (20) = 25.5, $Z = -1.78$, $p = .075$, suggesting that solution-driven Designers are somewhat associated with the most emotional empathy dimension.

6.2.2.2: Designer professional profile

There was no association between Designer job titles and self identified strategy. However, there was a strong association with professional experience, U (20) = 10.0, $Z = 3.07$, $p <. 025$. Designers with over 10 years of experience overwhelmingly considered themselves problem-driven in their design strategies, see Figure 34. If, as my original hypothesis suggests, those with problem-driven strategies are more likely to spend more time engaging with UX research, then professional experience is not only associated with UX research exposure (which was identified in

Chapter 4) but is also positively associated with a possible proclivity to utilize UX research. Recall that Kruger and Cross (2006), however, did not find that the nine designers in their study exhibited a strategy that was associated with experience. This could indicate that observed behavior and self-identified strategy do not correlate.



	1 year to less than 2 years	2 years to less than 3 years	3 years to less than 5 years	5 years to less than 7 years	7 years to less than 10 years	Over 10 years
Problem Driven N = 12	8%	0%	0%	8%	8%	75%
Solution Driven N = 8	0%	38%	38%	13%	13%	0%

Figure 34: Design cognition strategies versus professional experience

6.2.2.3: Designer personal profile

Gender was not statistically associated with self-identified design cognition strategies; however, age was associated, $U(20) = 14.5$, $Z = -2.62$, $p < .025$. Obviously, age and professional experience can be confounded variables; as such, I calculated the correlation between them for this smaller sample.[40] I found that the correlation was quite high in the reduced sample that reported design strategies, $r = .83$, which means that approximately 69% of the variance in professional experience was accounted for by age in this group ($N = 20$). Therefore, just as with professional experience,

[40] In the overall survey and design study population professional experience and age were correlated at $r = .61$ (see correlation tables in chapter four) which means that approximately 37% of the variance of the variables is explained by the other.

Designers are more likely to identify their strategy as problem-driven as they age, see Figure 35.

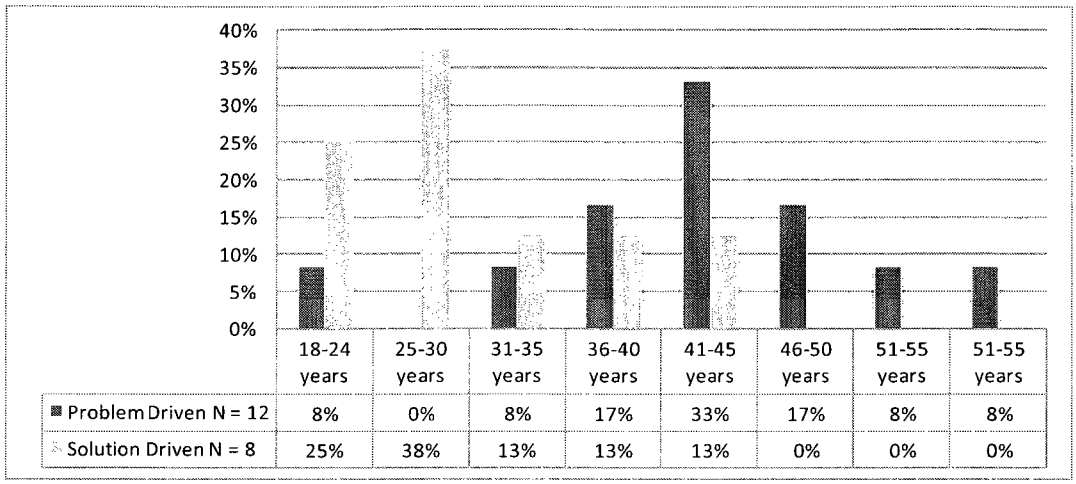


Figure 35: Design cognition strategies versus age

6.2.2.4: HCD orientation alignment score

Lastly, I evaluated associations between the HCD orientation alignment score established in Chapter 4 and self-identified design cognition strategies. There were no statistically significant associations. However, study participants and survey respondents who identified a solution-driven design cognition strategy were more likely to also have a low HCD orientation alignment score, see Figure 36.

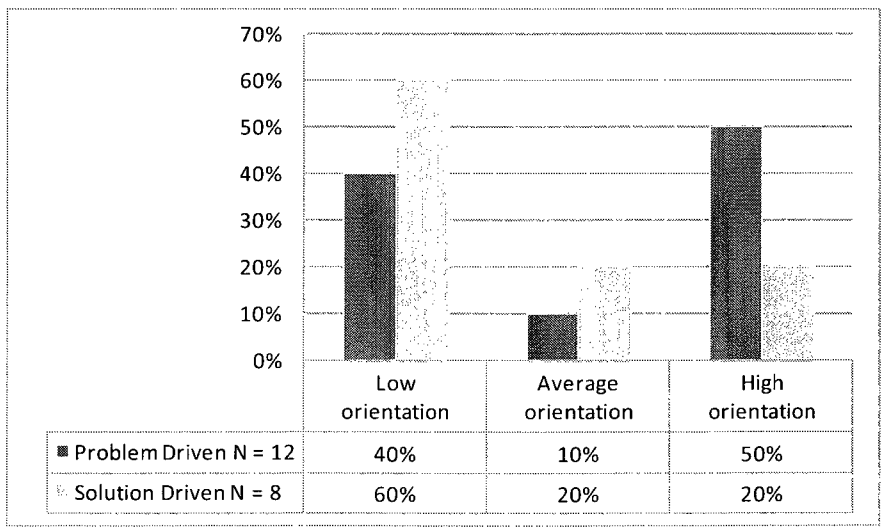


Figure 36: Design cognition strategy versus HCD orientation alignment scores

6.2.3: Summary: design cognition strategies

In sum, older, more experienced Designers were more likely to identify their design strategies as problem-driven, while younger, less experienced Designers were more likely to see themselves as solution-driven. This finding suggests that older more experienced Designers might be more likely to share a proclivity to engage with UX research materials (which is from the problem space). Additionally, the solution-driven group scored higher in the most emotional (PD) empathy dimension. This finding suggests that younger, less experienced Designers might engage with UX research materials more emotionally than their older, more experienced counterparts.

6.3: HCD orientation: experience with UX methods

Study participants and follow-up survey respondents were asked to estimate the number of projects in which personas and/or scenarios had been used in the last ten years. In the next sections, I describe the data analysis procedures (section 6.3.1), findings (section 6.3.2) and a summary of findings (section 6.3.3).

6.3.1: Data analysis procedures

First, I assessed the number projects in which personas/scenarios were used for the survey respondents and study participants separately. Next, I isolated the survey respondents with Designer job titles and combined those with the five study participants who claimed to have persona/scenario experience on the screening survey. I recoded the number of projects into four groups: (1) one project; (2) two to three projects; (3) four to seven projects; and (4) eight or more projects.

I conducted non-parametric univariate tests to investigate if the number of projects was associated with five constructs: (1) self-identified design strategy; (2) the empathy dimensions; (3) designer professional profile (experience and job title); (4)

designer personal profile (age and gender); and (5) HCD orientation alignment score for the Designer group.[41]

6.3.2: Findings

In the follow-up sample, the mean number of estimated projects was higher for scenarios ($N = 32$, $M = 4.7$, $SD = 2.4$) than for personas ($N = 33$, $M = 3.7$, $SD = 2.1$), see Figure 37.

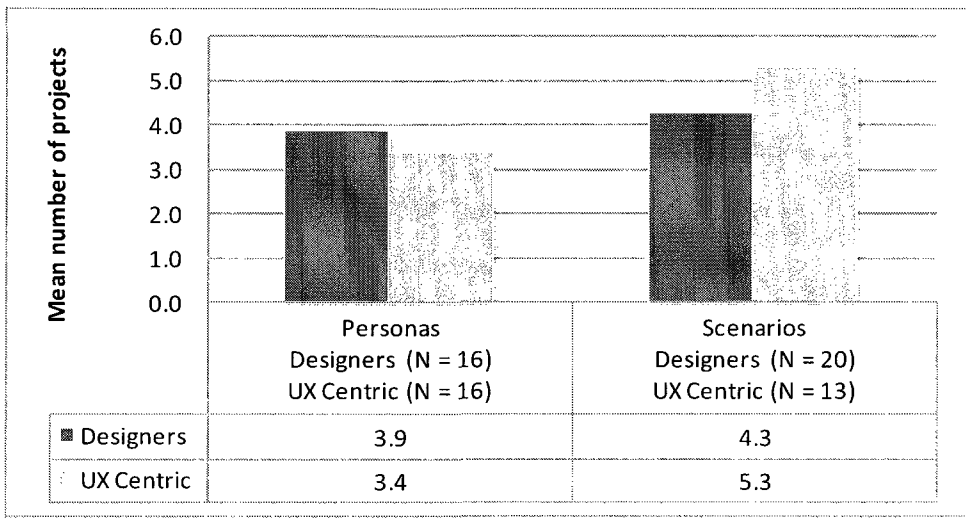
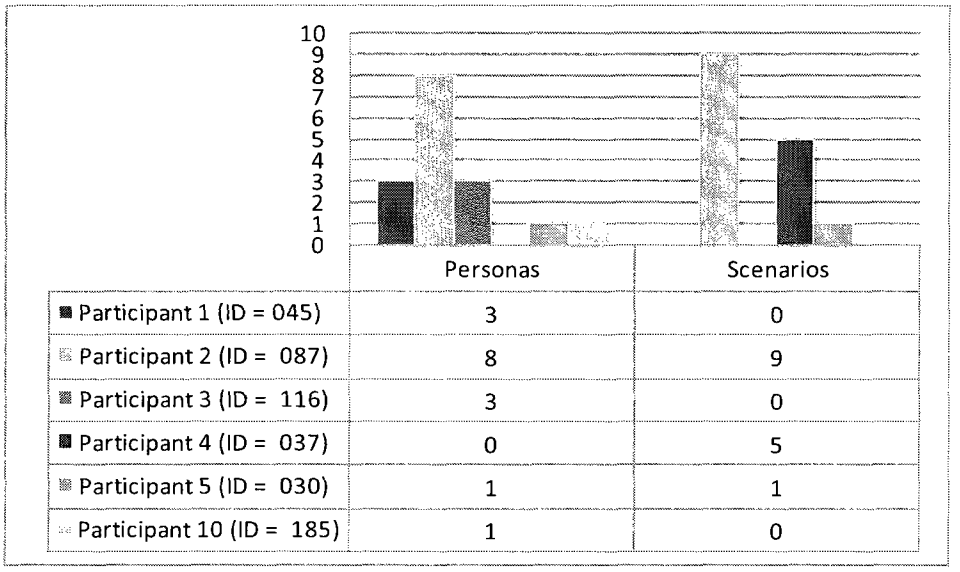


Figure 37: Follow-up survey responders: number of projects with methods

Five design study participants claimed to have had experience with personas while an additional three participants claimed to have experience with scenarios on the screening survey. Two of these participants claimed to have had experience with both. The number of experiences ranged from 1-8 in the last ten years, see Figure 38. The mean for scenarios was slightly higher ($N = 3$, $M = 2.7$) than for personas ($N = 5$, $M = 2.5$), see Figure 38.

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[41] For self-identified strategy I used a Mann-Whitney U test with the 'strategy groups' as the independent variable. To test the empathy dimensions, age and professional experience, I used a Kruskal-Wallis test in which the number of projects (ranging from 1-6) was the grouping variable. I used Chi-square for the remaining tests. I chose non-parametric tests because of the small sample sizes. For each of the five constructs I used a family-wise adjusted Bonferroni alpha when there were more than one variable in a construct.



	Personas	Scenarios
Participant 1 (ID = 045)	3	0
Participant 2 (ID = 087)	8	9
Participant 3 (ID = 116)	3	0
Participant 4 (ID = 037)	0	5
Participant 5 (ID = 030)	1	1
Participant 10 (ID = 185)	1	0

Figure 38: Study participants: number of projects with methods

In the next sections I present the findings for associations among the number of reported projects using the methods and other designer related independent variables.

6.3.2.1: Associations between the number of projects and other designer-related independent variables

Among all the designer-related independent variables, only the age of the participant/responder was associated with the number of projects in which personas and scenarios were used, $H = 10.13$,(3 d.f.), $p < .025$. Not surprisingly, younger Designers reported fewer projects than their older counterparts.

6.3.3: Summary: experience (HCD orientation)

The number of projects that study participants and survey respondents reported using personas and scenarios was only strongly associated with age; in the case of scenarios, the older the participants/respondents the more likely they were to have more experiences with personas/scenarios. This finding suggests that UX researchers can expect older Designers to have more experience using scenarios (not specifically context scenarios however) but not necessarily personas. This was similar to the finding in the screening survey which suggested that Designers with more professional

experience were significantly more likely to have exposure to UX research in general and to scenarios specifically, but not to personas specifically.

6.4: Expertise (object and audience)

There were three types of expertise I established for the ten participants in the design study, audience, object and domain. Recall that Adelson and Soloway defined the object domain as corresponding "to the general classification of the system according to its use." In their study, for example, they classified the electronic mail system in the domain of 'communications systems'. I defined the domain for this study as an 'electronic interaction design'. As such, I assumed that all of the participants would have domain familiarity; familiarity that varied with the level of professional experience.[42] Audience (section 6.4.1) and object expertise (section 6.4.2) are discussed in the next two sections.

6.4.1: Audience expertise

Recall that during the pre-amble, prior to being given any of the research material for the task, participants were asked about their familiarity with Kyrgyzstan, including the people, culture, and technology. Participants knew very little. Five participants claimed to know nothing (Participants 02, 03, 07, 09 and 10). Four offered knowledge (or guesses) of the location of Kyrgyzstan:

Participant 01: Is it part of Afghanistan?
Participant 04: It's in Russia?
Participant 06: This is a guess, but in the proximity of Afghanistan. Between Afghanistan and Russia?
Participant 08: So, I roughly know that Kyrgyzstan is one of those stans (sic) in the neighborhood of Azerbaijan and, etc.

Finally, the exchange with participant 05 led to carpets.

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[42] The level of object domain expertise is therefore confounded with professional experience which was established in the screening survey. In other words, a more experienced designer would also be expected to have a greater degree of object domain familiarity.

Cynthia:	So, tell me what you know about Kyrgyzstan, its culture, its people? And it's totally okay if you say: nothing.
Participant 05	Nothing at all. ...I know they make good carpets.

6.4.2: Object expertise

Participants were asked about their familiarity with the object (mobile phone text-based application) after they had completed the design task. None of the participants had any experience designing mobile phone text-based interfaces.

6.4.3:Summary: expertise

The object (mobile phone text-based application) was unfamiliar to all of the participants. All participants were assumed to have some level of domain familiarity (electronic interaction design) and none of the participants had ever designed for the Kyrgyzstan audience. Therefore, after considering the level of domain expertise (aka professional experience in the field), the participants were homogenous as a group. Recall that I introduced object and domain expertise as part of this study to try to understand the interaction of: (a) object; (b) domain familiarity; and (c) audience familiarity with persona/scenario use. However, it appeared that my participants were somewhat homogenous in their levels of expertise.

6.5: Next Steps

In this chapter I reported on four designer-related independent variables: empathy, self identified design cognition strategies, the number of experiences Designers reported in which they had used personas and scenarios, and design study participant's expertise with designing text interactions for mobile phones (object expertise) and their experience with the targeted Kyrgyz audience. These findings provided a lens through which the design study participants' findings are discussed in the next chapter.

Chapter 7 Results: How personas and context scenarios were used

In this chapter, I present results from the first part of the exploratory design study in which I observed how personas and context scenarios were used prior, during and after a 90 minute design task. Recall that during the design task, participants were asked to design a text-based user interaction for a proposed mobile phone directory that supported face to face social networks (the working title was the MoSoSo directory).[43] For more information about the proposed mobile social software directory, see Appendix A.

To provide a lens for analyzing the design study results, I categorized participants into three groups based on a level of design experience moderated by how long they chose to spend on the design task.[44] The grouping was based on design cognition research that indicated associations between professional experience and the ability to engage in the problem space (the literature supporting this assumption was reviewed in Chapter 1). I moderated the groups further by time on task because I felt that the act of spending more time would also lead to a potential increased time engagement with all the research materials. To achieve the design by task experience groups, I multiplied the participants design experience rank (range from one to five where rank one was two-three years experience and five was over ten years experience) by the amount of time the participant spent on the design task. The product resulted in

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[43] Recall that the user requirements for the directory were presented in two phases on the task definition sheet; participants were instructed to focus on phase one. Phase one user requirements aligned to the Parxat (business user) and Shirin (social user) personas. Phase two requirements aligned to the Shirin and Roza (home user) personas. As such, including the Roza persona's needs in the design were not necessary.

[44] All participants (except Heather) were told that they had 90 minutes to complete the task, but were not required to take the full 90 minutes. Four participants (Leanne, Luke, Malcolm, and Lewis) finished before the task time was expended. Heather had a late start due to traffic problems so was only allotted 75 minutes.

an overall design by task experience score, see Table 16.[45] The resulting groups were: (1) low experience (Participants 03, 10, 09 and 07); (2) medium experience (Participants 08, 02 and 01); and (3) high experience (Participants 04, 05, and 06). Pseudo names were given to each participant in which the names began with the first letter of their experience group.

Table 16: Design by task experience groups for design study participants

		Pseudo name	Professional experience rank	Minutes spent on task	Experince score relative to the
Low Experience	Participant 03	Leanne	1	46.7	**46.7**
	Participant 10	Lucy	1	81.2	**81.2**
	Participant 09	Lewis	2	51.7	**103.4**
	Participant 07	Luke	2	62.7	**125.4**
Med Experience	Participant 08	Malcolm	5	44.5	**222.5**
	Participant 02	Marco	4	87.2	**348.8**
	Participant 01	Maria	4	87.3	**349.2**
High experience	Participant 04	Heather*	5	75.7	**378.5**
	Participant 05	Hannah	5	87.2	**436.0**
	Participant 06	Howard	5	89.0	**445.0**

* Heather had a late start due to traffic problems so was only allotted 75 minutes

I used the design by task grouping to organize the findings in the next sections. I first created a profile by determining the designer-related independent variables for each participant in section 7.1. Following the profile information, I discuss the preamble findings in which the participant discussed their job responsibilities and were introduced to the research materials in section 7.2. I then discuss how the participant behaved during the task, focusing on how they interacted with the personas and scenarios in section 7.3. I also present the findings from the last two task phases: first, respondents were asked to rate their design, discuss what they would have done differently if they had more time, and talk about how the research materials were used to help achieve a solution; second, they were asked to describe their solution. Lastly, in

[45] Design by task experience resulted in almost the same outcome if I had used professional experience alone for the grouping. Only Malcolm moved from the high experience group to the medium experience group.

section 7.4 I summarize the study findings and then briefly describe the next steps for the dissertation in section 7.5.

7.1: Designer-related independent variables: design study participants

Before analyzing how the participants used the personas and context scenarios, I established designer-related moderator variables for each participant. Variables included: gender, age, job title, professional experience, empathy dimension scores, self identified design cognition strategy, HCD orientation alignment score, and experience with personas and scenarios. The next section presents these findings.

7.1.2: Findings

The design by task experience grouping was based partially on design experience; therefore, the lower experience groups obviously had less experience and were correspondingly younger. However, for the remaining moderator variables, each experience group represented a mix of gender, job titles, empathy scores, self identified design cognition strategy, HCD orientation alignment scores, and persona/scenario experience, Table 17.

In the next sections I first describe the age, professional experience, gender, job title, and experience with personas and scenarios by experience group (sections 7.1.2.1 through 7.1.2.3). I then present each participant's HCD orientation alignment scores (section 7.1.2.4), empathy scores (section 7.1.2.5) and self-identified cognition strategy (section 7.1.2.6).

Table 17: Participant profiles

	Age	Professional experience	Job title	Gender	Persona Experience	Scenario Experience
Leanne	25-30 years	> 2 years < 3 years	Developer	Female	3 projects	
Lucy	25-30 years	> 2 years < 3 years	Designer	Female	1 project	
Lewis	36-40 years	> 3 years < 5 years	Designer	Male		
Luke	18-24 years	> 3 years < 5 years	Designer	Male		
Malcom	41-45 years	> 10 years	Developer	Male		
Marco	31-35 years	> 7 years < 10 years	Designer	Male	8 projects	8 projects
Maria	36-40 years	> 10 years	Information Architect	Female	3 projects	
Heather	over 55 years	> 10 years	Designer	Female		5 projects
Hannah	41-45 years	> 10 years	Interaction Designer	Female	1 project	1 project
Howard	36-40 years	> 10 years	Developer	Male		

7.1.2.1: Low experience group (Leanne, Lucy, Lewis and Luke)

All participants in this group reported younger ages and (obviously) had less professional experience: Luke was the youngest (he declared his age as 22 years old during the study) followed by Leanne and Lucy who identified their age bracket as between 25-30 years of age. Both Luke and Lucy reported between two and three years of professional experience and Leanne and Lewis reported between three and five years of professional experience. Lewis was the oldest in this group reporting his age bracket as between 36-40 years old. Luke and Lewis were male designers; Lucy was a female designer, and Leanne was a female developer. Leanne and Lucy both claimed to have experience using personas; Leanne claimed to have experience in three projects while Lucy claimed persona experience in one project, see Table 17.

7.1.2.2: Medium experience group (Malcolm, Marco, and Maria)

Marco was the youngest of this group (31-35 years), followed by Maria (36-40 years) and Malcolm (41-45 years). Both Maria and Marco reported between seven to ten years of professional experience. Malcolm claimed to have over ten years of professional experience. Maria was an information architect, Marco was a designer, and Malcolm claimed to be a developer. Marco had the most experience of all the design study participants using personas and scenarios, claiming to have used them in eight different projects over the last ten years. Maria also had experience using personas in three previous projects, see Table 17.

7.1.2.3: High experience group (Participants 04, 05 and 06)

This was the oldest and most experienced group. Howard was the youngest (36-40 years) followed by Hannah (41-45 years). Heather was the oldest participant in the study, reporting her age as over 55 years. All had over ten years of professional experience. Howard was a male developer; Hannah was a female interaction designer, and Heather was a female designer. Hannah claimed to have experience using both personas and scenarios in one project and Heather reported using scenarios in five projects over the last ten years.

However, in later discussion with Heather, it became obvious that her idea of scenarios was not aligned to my operational definition of context scenarios.[46] This is how Heather described scenarios when I asked her about the number of projects in which she had used scenarios:

Cynthia	...you said in your screening survey, you have used scenarios before. About how many projects over the last ten years have you been given scenarios?
Heather	Oh my gosh. Not too many. Maybe five or six. ...Usually I end up developing.

[46] My operational definition included those answers which directly involved users in some way and helped Designers form a mock user construct, i.e. as an augmentation to personas. Specifically, I looked for answers describing scenarios as research summarizations that: (a) were stories about users interacting with a product or service; (b) provided context about the product or user situation; and (c) helped define and describe what different users might do with a product or system.

Cynthia	You create them yourself then?
Heather	Yeah. Yeah. And that's, again, the whole storytelling about a business. Sometimes people provide you with everything, because they have a lot of written material from before. Then I end up editing it. That's a scenario basically. That's, you know, the running theme of their business.

As such, I did not categorize Heather as having experience using context scenarios even though she claimed to have experience with scenarios on the screening survey.

7.1.2.4: HCD orientation alignment scores

HCD orientation alignment scores (ranging from 0-4) were distributed somewhat evenly among the experience groups indicating no apparent pattern between design by task experience groups and HCD understanding. See Figure 39 for the distribution of HCD orientation alignment scores among the groups.

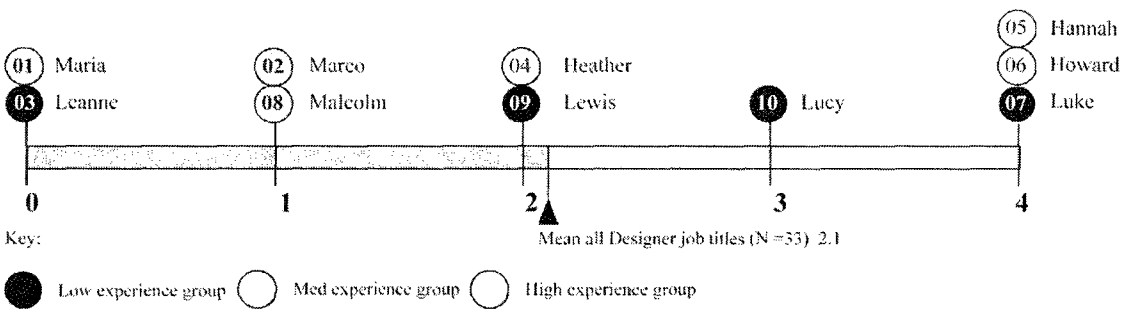


Figure 39: HCD orientation alignment scores among design study participants

7.1.2.5: Empathy scores

Empathy scores were distributed somewhat evenly among the three design by task experience groups indicating no clear association between the groups and the empathy dimensions. How participants scored in each empathy dimension is discussed in greater detail in the following sections (7.1.2.5a-d).

7.1.2.5a: Perspective taking. Eight of the ten study participants were below the mean in perceptive taking, the most intellectual of all the dimensions. The low experience group tended to cluster at the bottom of the spectrum and the medium

experience group at the top, see Figure 40. This would suggest that less professional experience is associated with a reduced ability to 'walk in someone else's shoes.'

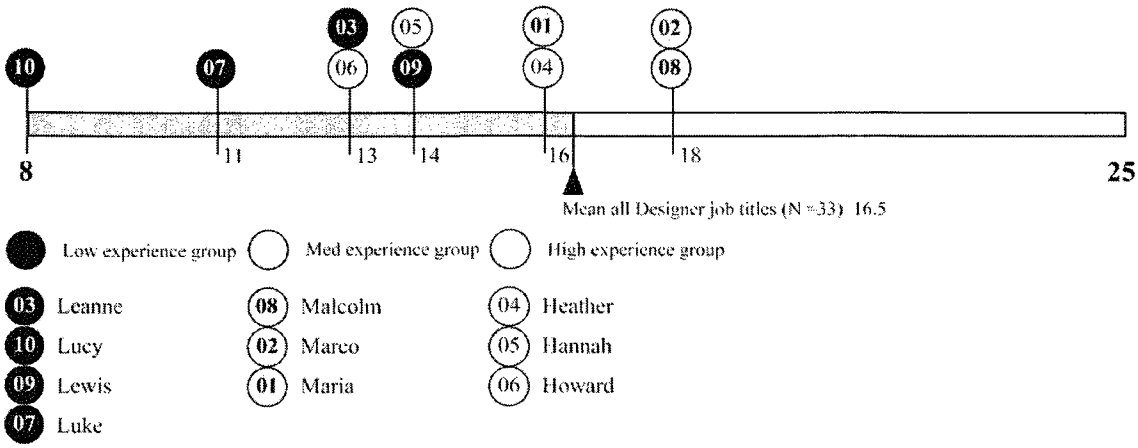


Figure 40: Perspective taking dimension scorers among design study participants

7.1.2.5b: Fantasy. Half of the participants scored below the mean in the fantasy dimension of empathy. Leanne scored way above the mean indicating that she might demonstrate a high engagement with fictional material that is found in books, games and movies. The four participants to score the lowest were Luke, Howard, Heather and Malcolm. The remaining participants were distributed around the mean, see Figure 41.

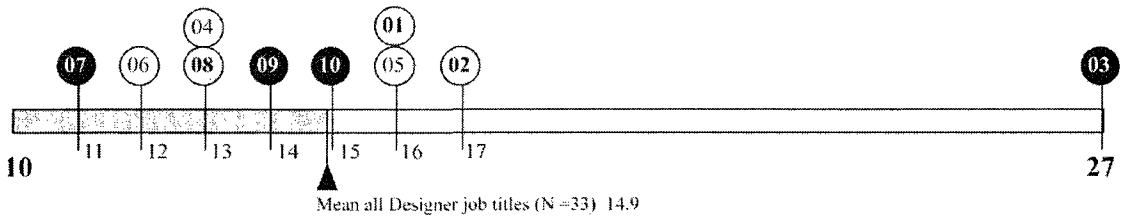


Figure 41: Fantasy dimension scores among design study participants

7.1.2.5c: Empathetic concern. Seven of the ten design study participants scored below the mean in empathetic concern. The lowest scores in this dimension were from two participants (Heather and Hannah) from the highest experience group. Malcolm scored high above the mean in empathetic concern, suggesting that he would be likely to display sympathy and concern for another in an unfortunate situation, Figure 42.

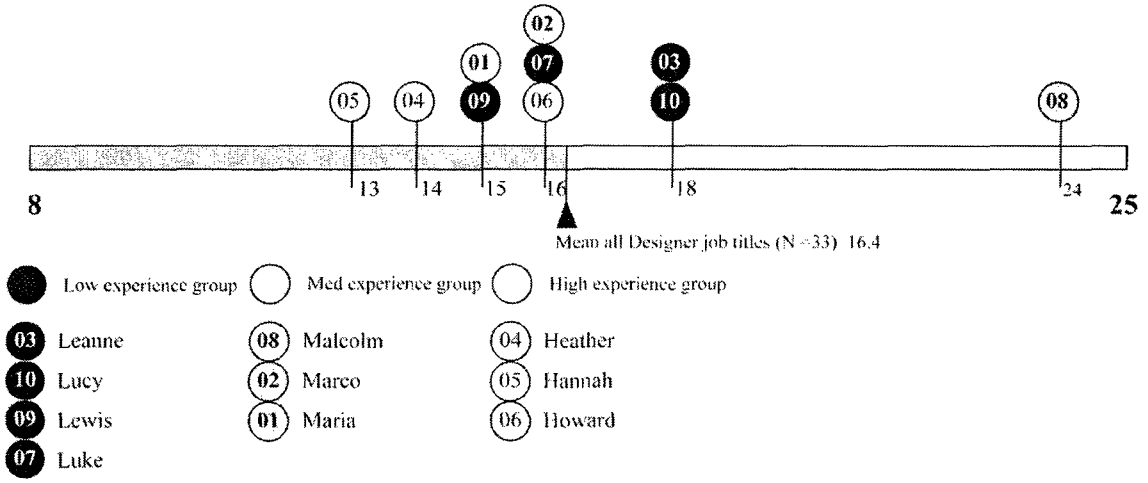


Figure 42: Empathetic concern dimension scores among design study participants

7.1.2.5d: Personal distress. This was the only dimension that as a group most (90%) of the design study participants scored above the mean. Recall that personal distress represents the most emotional empathetic dimension and that it appraises feelings of personal anxiety and unease in response to a tense situation involving other people. Half of the scores were clustered just above the mean at 10, see Figure 43.

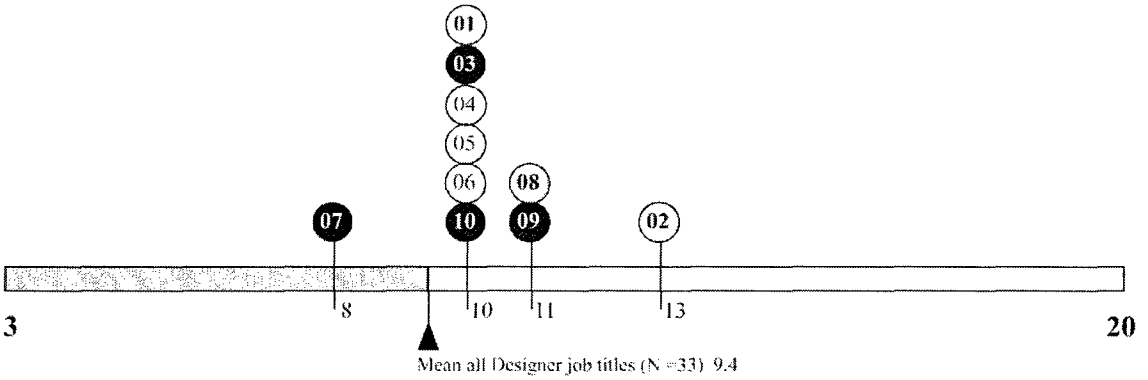


Figure 43: Personal distress dimension scores among design study participants

7.1.2.6: Design cognition strategies

Since self-identified cognition strategy was associated with professional experience and age in the combined study and survey Designer sample, there was an expected pattern among the design by task experience groups and participant's self-identified design cognition strategy. As expected, the entire high experience group

identified themselves as problem-driven while the entire low experience group identified themselves as solution-driven, see Figure 44.

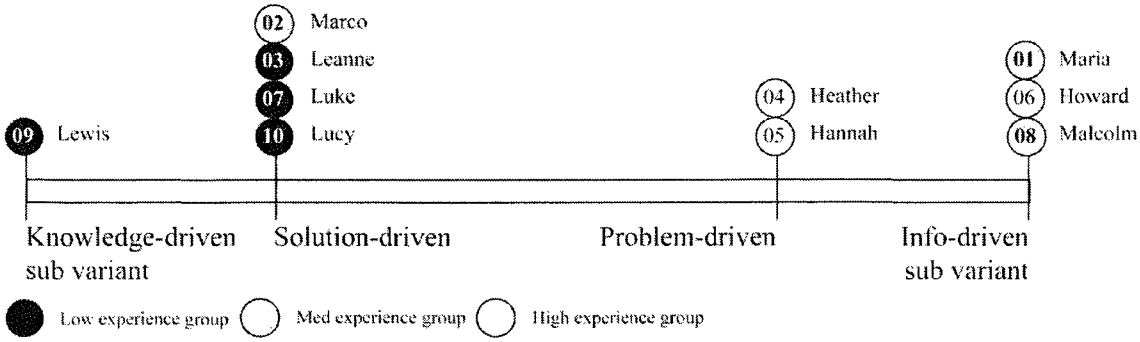


Figure 44: Self-identified design cognition strategies among study participants

Since experience was correlated with age, there was also a strong association with self-identified cognition strategy and age. Every participant under the age of 35 (Luke, Lucy, Leanne and Marco) identified themselves as solution-driven. Lewis, who was between the ages of 36-40, is the only example of someone older than 35 identifying with a solution-driven strategy among the design study participants. The remaining participants who were over the age of 30 identified themselves as problem-driven. This finding suggests that a combination of professional experience and life experience (i.e. age) effects how Designers view their own cognition style in which both variables are positively associated with self identifying as problem-driven strategists.

7.2: Preamble portion of the study

The preamble portion of the study started with reading back to the participants what they had written in the screening survey for their job description and then asking them if they could expand on their explanation. I coded the preamble discussion for any mention of creation or use of any UX research methods. In the next sections I outline the preamble procedures (section 7.2.1), and the preamble findings from each participant (section 7.2.2).

7.2.1: Preamble procedures

After asking about audience (Kyrgyzstan) familiarity in which no participant expressed knowledge beyond a general geographic area (findings from Chapter 6), the research materials were introduced. The introduction of the research materials was coded for: (1) approximately how long participants interacted with the personas and context scenarios[47]; and (2) recognition of the personas and scenarios as such.

I also coded discussion for both the moderator variables and dependent variables. Moderator variables included comments that recognized perceptions (research-related and distant audience variables) which indicated what the participant found salient about the research materials. Dependent variables included support of persona claims and criticisms of personas. In the next section (section 7.2.1.1), I outline how I operationally defined the perception and dependent variables.

7.2.1.1: Operational definitions for coding variables

For the perception-related independent variables, I was searching recognition of the variables which would indicate salience to the participant. This included references about the background of the research team, sample size, research methods deployed to create the artifacts, presentation methods and differences due to the fact that the audience represented a geographical or culturally distant audience. In regards to the distant audience, I coded recognition of the variables if there was: (a) any mention or focus on language differences; and (b) if the participant had questions that focused on possible differences between designing for the Kyrgyz audience versus a local audience.

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[47] The three personas and context scenarios described: (1) Parxat, a middle-aged business owner whose primary motivation to own a phone was to make calls when he was away from home or work; (2) Shirin, a twenty-something social user whose primary motivation to own a phone was to receive calls at all times; and (3) Roza, a middle-aged mother and housewife who used her phone primarily as a replacement for a landline. See Appendix C for copies of the personas and scenarios.

For the claim of focus, I identified evidence in comments or notes that were directed at separating the needs of the users by the persona groups presented in the research materials. In other words, I attempted to ascertain if the participant displayed an understanding of end user's needs and how needs were differentiated by user segments as defined by the personas and context scenarios. Keywords included segmentation, target, and roles.

The communication claim was affirmed if the participants referenced the personas, by name in *discussion* or in questions. Communication was also coded if participants discussed the users by roles that aligned to the personas, and did not necessarily use the persona names. In other words, evidence for communication was coded if the participants referred to the users as the business (Parxat), social (Shirin) and home user (Roza) as part of their conversation. Note that it was difficult at times to separate focus from communication. In fact, I discovered that there were no cases of communication without focus. A case of communication without focus would have involved a participant using persona names in conversation but not demonstrating any understanding about how the personas were differentiated. Keywords for communication included use of the persona names (Parxat, Shirin and Roza) and the use of roles, targets or segments in discussion.

Comments in which the participant clearly put him/herself in the user's situation (perspective taking) were coded for the empathy claim. Other empathetic behavior included involvement or questions about the lives of the personas (fantasy), compassion or concerned about the conditions of the persona's situation (empathetic concern), or expressed dismay about the persona's situation(s) as communicated by the scenarios (personal distress).

Avoidance of ill-informed assumptions and stereotypes was supported by discussion that expressed surprise about the Kyrgyzstan people in which a previously held stereotype or assumption appeared to have been changed. I differentiated between three types of surprise: (1) surprise deriving from a realization that the user was not

like them (surprise type I); and (2) surprise deriving from a realization that the user was similar to them (surprise type II); and (3) surprise deriving from a realization that the Kyrgyzstani people were different from a previously held stereotype about the population (surprise type III). The first two types are based on using oneself as the point of reference. The latter assumes an existing framework from which one has drawn assumptions; however, a previous framework was difficult to ascertain in the study because none of the study participants expressed significant previous knowledge about Kyrgyzstan.

Additionally, some comments that were coded for stereotype avoidance were also coded for audience distance. For example, expressing surprise that the Kyrgyzstan people were not using the Internet at high rates was coded for (1) surprise type I (i.e. they are different from me); and (2) acknowledgement of the distant audience.

The criticism of stereotype confirmation (or assumptive confirmation) was affirmed if participants were making assumptions that were not supported by data or presented in the research materials. In other words, the criticism was considered supported if it appeared as though the participant was treating the personas as empty vessels that the participant used to fill with preconceptions and assumptions they held about the audience.

Any reference to a past experience in which the participant or respondent referred to personas being used over multiple projects and thereby losing their effectiveness was coded for the criticism describing personas as becoming overused and stale.

Statements that inferred persona creation was difficult, requiring special research skills, were coded for the criticism of needing the specialized skills of a social scientist to create.

Overly abstracting the user criticism was coded if participants or respondents inferred that personas were too broadly defined to help or if participants/respondents explicitly expressed mistrust of the methods due to over abstraction.

If participants or respondents communicated a perception of misuse of the methods due to not understanding how personas 'should' be used, the response was coded for the criticism that designers need training to understand how to use the methods.

Statements that suggested that personas were made-up or not tied to research were coded for lack of believability. I found that this criticism was often related to statements that were also coded for the perception-related independent variable that pertained to research.

The next sections discuss the findings (section 7.2.2) for the job responsibility discussion and the research material introduction (section 7.2.2).

7.2.2: Preamble findings

There were four sections of findings for the preamble portion of the study: (1) job responsibilities (section 7.2.2.1); (2) length of preamble engagement with personas and context scenarios (section 7.2.2.2); (3) recognition of personas and scenarios (section 7.2.2.3); and (4) initial persona and context scenario impressions (section 7.2.2.4).

7.2.2.1: Job responsibilities

Job responsibilities were explored by first reading back what the participant had written in the screening survey. Participants were then asked if they had anything to add to their original description. None of the participants mentioned UX research in their original description or in the expanded discussion. I summarize the participant job responsibilities categorized by experience groups in the next sections.

7.2.2.1a: Low design by task experience group. All of the participants from the low experience group worked in web-based technologies.

- *Leanne.* Leanne identified her job title as a developer from the screening survey where she listed her job responsibilities as:
    - "HTML, CSS and optimizing graphics."

In the expanded design study discussion, I learned that she was typically given layered Photoshop files and asked to code web sites from the layered files. She is a recent graduate of the Seattle Central Community College web development program.

- *Lucy.* Lucy identified herself as a designer. She submitted a very detailed job description on the screening survey:
    - "Software beta-testing and bug reporting, concept development including UI functionality and visual appearance, create and modify XHTML/CSS templates for web, create original digital artwork and UI elements such as graphics, logos, etc."

  In the design study preamble she explained that she currently worked for a company that created sites for 'geo-caching".[48]
- *Lewis.* Lewis also identified himself as a designer on the screening survey, and wrote that he created:
    - "Website interfaces for clients and their customers."

  In our more detailed discussion, I learned that he is a solo freelancer with his own clients. He also has the capacity to hand code sites using CSS, HTML, and XML
- *Luke.* From the screening survey, Luke claimed the job title of designer and wrote in the screening survey that he:
    - "Designed web pages and wrote the content."

  In our discussion I learned that he typically designs his sites in Photoshop and then gives the Photoshop files to others for the coding of the site. He was not

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- [48] According to her description, geo-caching is a '*sort of game*' where people hide containers (called caches) all over the world and mark the cache's GPS locations on the website belonging to the company where the participant worked. The location identification permitted other users to find the cache in which the user described as including, "*some little trinkets, there will be a lot of books and you can sign your name, and you can keep track of how many caches you've found.*"

familiar with coding in CSS but knew a little HTML. He was currently a student and picked up freelance web site design as side projects.

7.2.2.1b: Medium design by task experience group. Two of the participants (Maria and Marco) in this group currently worked or had recently worked for large software companies, one of which focused on web-based technologies.

- *Malcolm.* Malcolm identified himself as a developer on the screening survey; he claimed to be an:
    - "Owner of a website publishing company."

  In the preamble conversation he claimed that he designed print, web and video materials, but that he does not do any coding of the websites himself; instead, he worked with others to do the actual development. His expanded job description was actually more aligned to what was typical for designers. I interpreted this as meaning Malcolm viewed the job title developer in the general sense but not related directly to programming.
- *Marco.* On the screening survey, Marco identified himself as a designer. He wrote that his responsibilities included:
    - "...visual production work, branding, visual asset implementations."

  He has worked for a large software company for ten years in the same product group; consequently he has seen many production cycles. He was one of the few participants not currently focused on web-based technologies. Recall also that Marco was the most experienced with the persona and context scenario methods.
- *Maria.* Maria identified her job title as an information architect. On the screening survey she wrote that her job responsibilities were to:
    - "Develop use-case flow diagrams, site maps, wireframes and research current best practices and brainstorm UI concepts."

In the design study she said that her most recent job was to conduct a 'website audit' at a large software company. She explained that a website audit is a process of categorizing and identifying all the pages of a web site. At the time of the study Maria was between jobs and was considering a contract position out of state.

7.2.2.1c: High design by task experience group. Heather and Howard worked as freelancers who interacted directly with their own clients. Hannah worked for larger organizations.

- *Heather.* Heather identified herself as a designer from the screening survey where she wrote:
    - "I am a graphic designer with both print and web experience. I own my own studio and have also taught in the field for seven years."

  As an older designer, she had to transition her traditional print skills to the web and reportedly has designed everything from very simple sites to complex data-driven sites. She claimed that she did not always program the sites herself but was capable of simple HTML coding. She still designs for print and teaches part time in the University of Washington's web design certificate program.
- *Hannah.* On the screening survey, Hannah identified her job title as an interaction designer and submitted:
    - "...designed interactive online learning content for web-based delivery."

  At the time of the study she was involved in creating a technical training program for law enforcement officers.
- *Howard.* Howard was a freelance developer who wrote on the screening survey that he was responsible for :
    - "...custom solutions in the computer aided engineering industry...these vary from standalone C++ apps to Excel macros."

At the time of the study he was working directly with a client to create an Excel spreadsheet tool intended for use by an engineering department for project management.

7.2.2.1d: Summary of job descriptions. In summation, none of the participants mentioned UX research in their original description or in the expanded discussion. Most worked in web-related technologies and half (50%) were self-employed or worked as freelancers.

7.2.2.2: Length of preamble engagement with personas and context scenarios

Recall that I presented the personas and context scenarios as the first set of research materials. The materials were presented in two stacks (one persona and one context scenarios). Participants were asked to discuss their thoughts about the documents. Participants spent as little as two minutes and 30 seconds interacting with the personas and context scenarios (Lewis) to as long as 14 minutes 10 seconds (Malcolm), see Figure 45. Note that most of the participants split their time between the personas and context scenarios with two exceptions: Howard spent over seven minutes on the scenarios and only three minutes on the personas; and Malcolm spent over 10 minutes on the personas and less than four minutes on the scenarios.

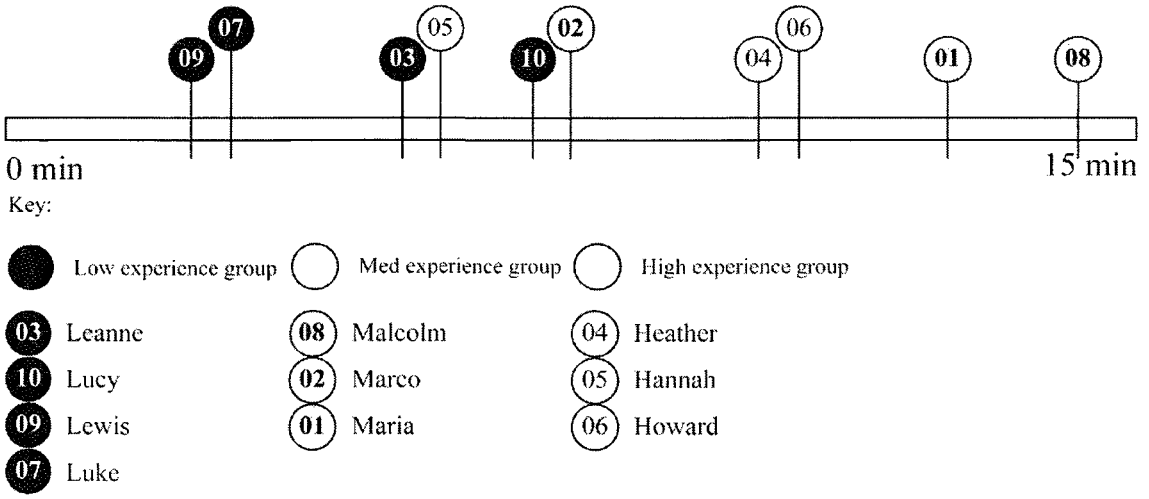


Figure 45: Preamble time spent reviewing personas and scenarios

As a group, the low design by task experience group spent the least amount of time, while the medium experienced group spent the most amount of time. This initial pattern supports results from studies in the design cognition field which has found that the least experienced Designers spend the least amount of time with research materials (problem space). This finding also suggests, however, that the most experienced Designers may require less time in initial design phases than their medium experienced counterparts before feeling comfortable proceeding with the design solution.

Additionally, all of the participants who identified themselves as solution-driven spent less time in their initial interaction with the materials (with the exception of Hannah who identified herself as problem-driven). This finding indicated that self identified cognition style reflects actual behavior in the initial phases of design.

7.2.2.3: Recognition of personas and scenarios

Only Maria recognized the personas. None of the participants identified the (context) scenarios as such. In Maria's recognition of the personas, she felt the persona presentation was such that it indicated that they had been created for stakeholders.

Maria	It seems like the way these personas were designed, they're geared towards stakeholders. The presentation is really polished with nice photos and layouts. For stakeholders or executives, you don't have the time to go in depth, so they just scan the information quickly.

7.2.2.4: Initial persona and context scenario impressions

In this section I present the results of the participant's initial discussion about the personas and context scenarios as they were introduced in the preamble phase; as such, these comments represent participant's first impressions. Specifically, I coded for comments that: (a) indicated recognition of the perception related independent variables (background of the research team, sample size, research methods deployed to create the artifacts, presentation methods and distant audience acknowledgment; and (b) supported dependent variables related to the beneficial claims and criticisms. The

findings are presented for each experience group (section 7.2.2.4a-c), followed by a summary (section 7.2.2.4d).

7.2.2.4a: Low experience group. The low design by task experience group spent less time in the preamble phase reading and scanning the personas and context scenarios. As a group, (with the exception of Lucy), they did not reflect on the fact that the personas and context scenarios represented a geographical and culturally distant audience. I detail each participant's initial reaction to the documents in the next sections followed by a summation of differences found within the low experience group.

- *Leanne.* Leanne spent approximately 5 minutes and 20 seconds initially reviewing the personas and scenarios. She was not very impressed with the personas and context scenarios. She felt that they were corporate looking and reminded her of work or something that she had used in her school experience.

Leanne	I kind of feel like I'm at work. So, I feel kind of bad about that. But I can't really focus on it, because... ...It's very corporate looking.[49]
Cynthia	Very corporate looking?
Leanne	Yeah. It's very corporate...except for the top. ...The top looks kind of weird with the design of like the users. I think it's very common these days, but maybe it's just the way it's printed on paper.
Cynthia	That's fine. We're just trying to get your initial reactions.
Leanne	It really reminds me of the assignments that I had at Seattle Central. ...I had never actually seen in, like, say where I work, but I thought that maybe I...was never shown anything like that, because by the time it got to production, you know, why would you really...?

[49] Note, that in all conversations with study participants I have deleted most of my "uh-huhs' and 'okays'. I only included my side of the conversation if it had some sort of meaning or helped to direct the conversation. I signify where I have deleted acknowledgements on my part with a new paragraph separation, beginning with three ellipses, for example ...new paragraph.

This exchange suggests recognition of the perception-related independent variable of presentation indicating that presentation was important to the participant. Leanne clearly did not like the presentation expressing that it was 'corporate' and reminded her of work. Based on her last comment, as a person responsible for development, she viewed the personas and context scenarios as something that she would not need nor had ever received outside of a school environment; consequently she was initially dismissive of the documents. There was no evidence to support any dependent variables.

- *Lucy:* Among the four participants in the low experience group, Lucy spent the longest time reviewing the personas and scenarios; she spent approximately seven minutes reviewing the documents. Additionally, she was the only one in this group to acknowledge that the personas and scenarios represented a distant audience in which she was unfamiliar; therefore, her initial impressions supported the importance of the distant audience (moderator) variable. In her review, she directly discussed the personas as though they were real people, calling them by their names, and was clearly working out some of the details of the user requirements in the process.

Lucy Mobile phones are cheaper than landlines. That's interesting. So, he *(referring to Parxat)* would seek recommendations for professional help, such as plumbers and computer maintenance. And he would join the...group. So, he seems to me like, for instance, when I was reading about social networking, he seems like he would be more of a basic phone user.
...It looks like he's pretty computer savvy, because he maintains computers and he has the computer game club. So, he's using his phone to ...Oh, okay. He's texting the directory to find a network technician. So, this MoSoSo directory is basically filling in knowledge for him that he wouldn't be able to acquire otherwise. And it sounds...I mean, it's convenient, because it's on his phone. He doesn't have to go find a computer, and connect to the internet, and do a Google search or whatever. So, this

> Shirin seems like she'd use it for, kind of like, a mobile FaceBook sort of thing?
> ...Because she'd use a directory...would use a service mostly to create groups of friends. So, would use it to broadcast messages to groups to tell people that there will be social gatherings....use it for paintball. That's funny.

Lucy's comments appear to support the focus claim in that she immediately begins to concentrate on the differing needs of the three users. The communication claim was also supported by her referencing the personas by name and communicating with me directly about the set of users. Additionally, at least one comment supported the claim of avoiding stereotypes.

In the above exchange, Lucy found it '*funny*' that Shirin's boyfriend used the directory service to arrange a paintball gathering. Lucy actually laughed out loud when she read the paintball scenario. While I did not directly ask, my impression was that this seemed humorous because it was an activity in which she did not expect people from Kyrgyzstan to engage. I interpreted this as type II surprise (surprise deriving from a realization that the user was similar to them).[50] There was no evidence to support any other dependent variables or any recognition of perception-related independent variables.

- *Lewis*. Lewis spent the least amount of preamble time engaged with personas and context scenarios, spending approximately two minutes and 30 seconds. He read the Parxat persona information out loud then grabbed a pencil and started to make notes; I watched him for about a minute, and then asked him if was starting with the task.

Cynthia Are you starting to solve the problem? Because if you're starting to solve the problem, that's great . . .

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[50] It could have been type III surprise (surprise deriving from a realization that the Kyrgyzstani people were different from a previously held stereotype about the population); however, she did not seem to have an established existing framework from which stereotypes could be derived.

Lewis	Uh huh.
Cynthia	It's a 90 minute task and I just want to make sure that I'm tagging it correctly.
Lewis	I am starting to solve the problem.
Cynthia	Okay. So, you feel comfortable moving ahead with this problem?
Lewis	Yes.

Following this exchange, I gestured to the folder with the remaining materials and moved over to the other side of the lab partition. Lewis's immediate engagement with the task was quite unexpected and not typical among the ten participants. Because of the truncated preamble discussion, I was not able to gather any information about the participant's first impressions of the personas and context scenarios without breaking the flow of the session and making it too obvious that I was observing how he was using the materials.

- *Luke.* Luke spent approximately three minutes reading and scanning the personas and context scenarios. Luke appeared to be personally identifying with the Shirin persona and distancing himself from the other two personas based on age. Additionally, he found the scenarios difficult to read because they were too textual in his opinion.

Luke	Okay. First thing that came to mind was why is there an older guy on this? ...Okay. So, I'm guessing this is targeting this age group, because they're giving me his personal information so that people can relate to him. ...This is obviously a younger woman.*(Referring to the Shirin persona).*
Cynthia	Go ahead and spend as much time as you want.
Luke	Oh. Okay. Right. So, these are, like, the three main types of target market that you guys are basically looking at right now, using their primary motivation, which his is obviously to make calls when he's *(Parxat)* away from home. She's obviously in that generation who will always need a cell phone at her hip *(Shirin).* It's, kind of, like my generation, I'm 22. So, we are constantly keeping in contact with friends, sending, receiving texts.

	...(*Looks at the Roza persona).* And, then, she looks like the mother that has realized that home phones are obsolete and probably can get away with just using a mobile phone. ...And this one makes me not even want to read it, because it's so...hard. *(Referring to the scenarios)*
Cynthia	So hard?
Luke	Yeah.
Cynthia	That's really good info.
Luke	I just want to read more about exactly, in bullet points, on how old they are, what their income is, who they are.

This exchange supports the stereotype confirmation criticism of personas; instead of avoiding stereotypes and correcting assumptions, Luke is applying his own interpretation of the personas. In his personal connection to the Shirin persona, he applied his knowledge of his age group directly to her; knowledge that was not in the information presented by the personas.

There is some support in his comments for the focus claim because he appears to be honing in on the three specific users; however, I did not code this exchange for support of the communication claim because there is no reference to the users by name or by role that aligned to the personas as presented. Instead he reduced the users into age groups of the 'old guy', the 'mother' and the young hip person from his generation. There is no evidence in his comments to support any of the other dependent variables.

There was recognition of the perception-related variable of presentation. He clearly does not want to engage with the context scenarios, finding them too textual and 'hard', expressing a preference for bullet points.

7.2.2.4b: Medium experience group. The medium design by task experience group spent the longest time initially reviewing the personas and context scenarios compared to the other two groups. All three of these participants explicitly acknowledged that the personas and context scenarios represented an audience in which they were unfamiliar.

- *Malcolm.* Malcolm spent the longest of all participants in the preamble phase with the personas and scenarios, spending over 10 minutes with the personas and approximately four minutes with the context scenarios. Although Malcolm spent a lot of time with the documents, he spent most of the time reading documents out loud word for word including minimal personal reflection about what he was reading. This could have been due to his understanding of the Think-aloud protocol (TaP).[51] For example:

Malcolm Personal information. Personal profile. I'm not quite sure what I'm looking at. Lives in the capital city. Home life Russian, reads, speak, language, Kyrgyz, work language Russian. Hm Okay. So, he's likely bi-lingual. There's, kind of, a regional language and a lingua franca. ...So, this is very extremely specific as to the . . . It seems like this is information about a single individual, as opposed to
...Oh, okay. Now I've turned the pages and I see that there are three different personal profiles. So, I'm looking at the personal profile of Shirin. So, Parxat, that's somebody's name. That wasn't even immediately obvious. He's using it for...It says practical, but I'm thinking more like economic or financial business usage. Shirin's more social. Roza, replacement. So, that's indicating... So, it's name and, supposedly, motivation for buying a handset device; the hardware. Primary motivation to acquire the phone for Roza. Has no home phone.

There is evidence in the above passage to support the communication claim because he is referencing the personas by name. The acknowledgement of the language difference suggests that the participant recognized the perception-related distant audience variable. There was also support for the empathy personas claim (dependent variable) in this exchange:

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[51] Recall that prior to the research material introduction, I instructed participants on how to perform TaP using a flashlight as an example. All participants were invited to practice on their own flashlight. The participants were asked to think-aloud as I introduced the materials, but were later instructed that it was not necessary to perform TaP through the task session.

Malcolm Okay. I think people in Kyrgyzstan ...It seems to me that people are extremely highly likely to ask a friend, who they have a rapport with, and trust and loyalty, who are their service providers. When I need a dentist, and especially if I'm not text savvy, I'm probably very much more likely, it seems to me, to ask somebody in my immediate social circle, than to go through the internet or some phone system....

Towards the end of his review he seemed to be confused about why he was reading the personas and context scenarios in the first place. At this point he stopped reading the personas and context scenarios, focusing instead on the budget and schedule documents.

Malcolm My motivation here is extrinsic in that it's not like, hm, I wonder if I should join FaceBook and here's this FaceBook package. And I'll look through this thing. I'm looking at this 'cause you're saying, hm, here look at this. So, I don't really have a sense of, you know, hypothetical intrinsic motivation; why I would continue looking through the package. If I'm trying to figure out, is this something I want to invest in? Is this something, you know, a client's asked me to look at this idea?

Cynthia We're asking you to design the interaction.

Malcolm Got it. Okay. So, let me take a look at what else I've got here. It's easy for me to, kind of, hypothesize that you're coming to me and saying, I've got an idea for this mister. Would you take a look at this data I've got? So, here's the project schedule. Nicely done. I rarely see a client who's got such a detailed chart of their schedule. The text is very, too small for me. I can read it, but I read nine hours a day. ... (*his review and advice on the budget and schedule continued for another five minutes*).

In sum, Malcolm appeared to empathetically connect with a need for the mobile directory service and he was clearly aware that these documents represented a distant audience. His reference to the users by name provided support for the communication claim. There was no additional recognition of perception-related independent variables or other dependent variables. His

confusion at the end of the preamble suggests that he really did not understand the purpose of the personas and context scenarios and consequently moved his attention to the budget and schedule documents.

- *Marco*. Marco spent approximately seven minutes and 30 seconds reviewing the personas and scenarios. After reading the documents in silence, I asked for his impressions. His comments were not about the audience; instead he focused on what he felt the technology meant to the audience.

Cynthia	So, what are you thinking of these materials?
Marco	In what regards? Like how they will apply to the problem?
Cynthia	Yeah. Like, what are you gleaning? What kind of information are you getting out of them?
Marco	I think the information is pretty good.
Cynthia	What do you mean by good?
Marco	They're establishing a good sense of why they think the phone is important. And it seems to be breaking down things in distinct groups like the practical and the social aspects. ...It's also establishing the idea that internet and phones, mobile phones, are kind of new to the whole group, or to the country. At least that's the impression that I get. ...I think all three recognize the importance of what the potential of the internet or mobile device is to their success in the future. It's a way to connect the people.

There was support for the focus claim in that Marco identified that the personas and context scenarios were breaking the audience down into 'distinct groups'. Marco also acknowledged that the documents represented a distant audience. There was no evidence to support recognition of any other perception-related independent variables or to support dependent variables.

- *Maria*. Maria spent approximately 12 minutes and 30 seconds reading and scanning the documents. Recall that Maria was the only participant to call the persona documents by that label (they were titled profiles). She provided detailed personal reflection as she read the personas and context scenarios.

Maria's discussion focused on recognition of three perception-related independent variables: (1) distant audience; (2) presentation; and (3) the research methods used to create the documents. Comments that focused on the distant audience perception led to a desire for more contexts in the presentations in this exchange:

Maria It seems like the way these personas were designed, they're geared towards stakeholders. The presentation is really polished with nice photos and layouts. For stakeholders or executives, you don't have the time to go in depth, so they just scan the information quickly. Let me read it carefully, since

...So, I don't know anything about this country, but if this is geared towards foreigners, or Americans, or non-Russians, it would be nice to have an appendix with photos showing where he works, a photo of him working at his workplace, directing with his customers, who his consumers are, to get those type of photos.

...So, I'm looking at the technical information for Shirin and I'm kind of confused. It says internet use. Length of use, 33 months. So, did she start using the internet 33 months ago? That seems kind of odd, because looking at her photo with her two cell phones, she seems tech savvy. But at the same time, we don't know about this culture. Maybe they didn't have internet in this country until a few years ago. It's hard to say. But I think I understand this demographic. I think. I'm not sure. As mentioned, it would be nice to have an appendix with photos of her interacting with her friends and being in college. And, like, where does she spend most of her time. It seems like at a cafe, so photos of her at a cafe to get a greater context. Maybe she's like anybody else in the US who goes to college, but it's hard to say.

...So, I think as overviews they're great for Kyrgyz people. They would probably get it . . . understand it more. People who understand this culture - Kyrgyz. But for non-Kyrgyz, who don't know anything about this society, it's still a little bit vague. But for stakeholders they're fine.

...Now I'm looking at Roza's persona. The phrase middle class is so interesting, because, what is middle

> class compared to upper class, or upper-middle class, or lower class, or working class? I mean, here it says her husband is a driver, but that seems more working class. I don't know. So, once again, it would be nice to get photos of her at her home. Also, maybe a little bit more context like showing what's upper class, or middle class, or lower class in this society is hard to understand. ...Is this research on actual people? They're not fiction? They're based on actual people?

I interpreted this last concern (*they're not fiction?*) as related to concerns pertaining to research. Maria's first impressions also supported two dependent variables: both the focus and communication claims. Focus is supported by her recognition of differences among the three user groups and the communication claim is supported by her use of the persona names in her discussion.

7.2.2.4c: High experience group. The high design by task experience group was in the middle range in regards to the length of time spent initially reviewing the personas and context scenarios. Only one of the three participants made comments that acknowledged that the personas and scenarios represented an audience in which she was unfamiliar.

- *Heather.* Heather spent approximately 10 minutes reading and scanning the personas and context scenarios. She read silently for most of the ten minutes. She asked a few questions about the documents as she read and expressed surprise and amazement about some of the facts contained within the personas and scenarios; her surprise tended to be type I surprise (deriving from a realization that the user was not like her) and focused on the unfamiliarity of the audience. For example this exchange about income:

Heather	Is this a lot of money there?
Cynthia	The average income is about $137 a month.
Heather	Wow.

This conversation was about the fact that Roza did not have Internet or a landline:

Heather	If she lives in a rural area can they not get internet connections?
Cynthia	Oftentimes they have a problem.
Heather	I'm surprised a cell phone works.... One landline in the community building that closes at 5:00 p.m. every day. That's incredible. How spoiled we are.

Heather's amazement of the economic and technological differences between Kyrgyzstan and the US indicated recognition of audience distance. This passage also provided support for the empathy claim, in that, she appeared to be imagining how difficult it might be to have limited access to a phone.

- *Hannah.* Hannah spent the least amount of time in the high experience group with the personas and context scenarios during the preamble, spending approximately five minutes and 30 seconds. At first, Hannah did not understand what the personas were intended for.

Hannah	Or is this user requirement? Or is it, kind of a personal profile? So this is the potential users?

Next, Hannah laid out all three personas so she could compare and contrast them simultaneously. Once she had identified that the personas represented three users, she read over the context scenarios mostly in silence. In this passage she identifies the three user groups.

Hannah	So... I have no home phone. Okay. So this is a person who uses it in most of his work. This is a person who uses it mostly for social outlet. And this is a person who maybe she's using it just to replace her existing phone.

She appeared to be more comfortable with the context scenarios and identified them as a 'system spec', but on closer examination did not think they were as detailed as she would expect:

Hannah Oh, so, here are some of the things we have to be able to do with it. Okay. Create a telephone... into groups....Create groups of friends ....text messages....in the groups. Okay. This is very much more like a written like... like a system spec

Cynthia So, what are you thinking when you read those?

Hannah Well, when I first saw it I thought this was very . . . it seemed very action-oriented...user requirements ...like, want to be able to do this within this amount of time ...It's not as fine-tuned as I thought it was...So, these are just, kind of, describing typical interactions that he might have with this system.

Towards the end of the preamble I asked participants if they felt comfortable proceeding with the design, or if they still had questions. Hannah responded with a question that acknowledged the distant audience.

Hannah I guess, maybe, one of the questions I have is language.

Cynthia Assume it's going to be in Russian. About 97% of mobile users can speak Russian. So, it would be in Cyrillic.

Hannah's initial reactions supported the focus claim in that she identified the three user groups and that they all had different requirements of the service. None of the other dependent variables were supported; beyond the distant audience no other perception-related independent variables were recognized.

- *Howard.* Howard spent approximately 10 minutes and 30 seconds reviewing the personas and context scenarios, in which he spent over seven minutes of that time focused on the context scenarios. In his first impression of the personas he identified the three persona categories supporting the focus claim.

Howard Okay. Well, these look like they're describing users. They're user profiles, to give me a little bit of background about each of these three people. These might be, like, typical users that I would expect to use the application.

> ...And they are tech savvy, not tech savvy, and somewhat tech savvy. So, you were talking about their ...the demographic information; where they live, their socioeconomic type-stuff. They all have cell phones.

Howard was much more comfortable with the context scenarios, calling them 'use cases'; however, he agreed with Hannah in that they were not detailed enough.

Howard	Okay, this is interesting. So, it seems that these are use cases for . . . to actually use in the system.
Cynthia	That's what you call them is the use case?
Howard	Yeah. So, oftentimes I've been asked for a very specific ...You type this. You press this button. It does this....So, this would be . . . I guess this would be fairly close to that ...If I'm spec-ing out a project it's a fixed price, I would demand very specific cases like that.
Cynthia	Okay. So, more detailed than this?
Howard	Oh yes. Significantly. If I'm asked what I'm . . . This is typically what I would get if I'm preparing a fixed price quote. ... They would give me some sort of... some examples of how they would expect the product to be used. This is what I would expect.

There was evidence supporting the focus claim in Howard's initial reactions; however, I did not feel there was strong evidence to support any other dependent variables. Additionally, there was no evidence of recognition of perception-related independent variables.

7.2.2.4d: Summary: initial impressions. There was a wide range of initial responses and reaction to the personas and context scenarios. There was considerable recognition of the perception-related distant audience independent variable in that five of the ten participants made comments that acknowledged perceived differences between a Kyrgyz audience versus a local audience. There was also some recognition of the perception-related presentation variable in that three participants (Leanne, Luke

and Maria) made comments that recognized the presentation. Leanne did not like the presentation expressing that it was too corporate and 'reminded her of work', Luke did not like the textual display of the scenarios expressing a preference for bullet points, and Maria felt that the presentation was polished looking but lacking in content, expressing a need for context of use because of the audience distance.

There was strong support for the focus claim in that six of the ten participants appeared to understand that the design was to address the needs of the three specific user groups. There was some support for the communication claim: Lucy, Malcolm and Maria began discussing the users by using the persona names immediately upon seeing the documents. Two participants provided evidence supporting the empathy claim (Malcom and Heather) by displaying perspective-taking, i.e., putting themselves in the user's situation. Two participants, (Heather and Lucy), provided evidence of ill-informed assumption/stereotype avoidance. I categorized Heather's surprise as type I (deriving from a realization that the user was not like her) and Lucy's as type II (deriving from a realization that the user was similar to her). See Table 18 for a summary of which perception-related independent and dependent variables were evident in the initial impressions.

Table 18: Persona and scenario first impressions

	Recognition of perception-related variables			Support for claims/criticisms				
	Distant audience	Research methods	Presentation	Focus	Empathy	Communica-tion	Avoid ill-informed assumptions / stereotypes	Sterotype confirmation
Leanne								
Lucy	Yes			Yes		Yes	Type II	
Lewis								
Luke			Yes	Yes				Yes
Malcolm	Yes				Yes	Yes		
Marco	Yes			Yes				
Maria	Yes	Yes	Yes	Yes		Yes		
Heather	Yes				Yes		Type I	
Hannah				Yes				
Howard				Yes				
Total	**5**	**1**	**3**	**6**	**2**	**3**	**2**	**1**

7.3: Task portion of the study

In this section I present the procedures (section 7.3.1) and findings (section 7.3.2) for the task portion of the study. Lastly, I summarize the task findings in section 7.3.3.

7.3.1: Data analysis procedures

There were three sections in the task portion of the study: (1) the design session in which the participants were given up to 90 minutes to devise a solution for the text-based interaction design problem (section 7.3.1.1); (2) the debrief (section 7.3.1.2); and (3) the design description (section 7.3.1.3). Data analyses for each section is described below.

7.3.1.1: Design session

The design session was coded in 10 second intervals in which I assessed if participants were: (1) interacting with the personas; (2) interacting with the context scenarios; (3) interacting with the persona detail sheets; (4) interacting with the task sheet; (5) interacting with other research materials; (6) other work related tasks, which included organizing the space or looking at their mobile phone for reference; (7) other non-work related tasks, which included drinking coffee, or getting up and stretching; (8) verbalizations that were directed towards me; (9) my response to their verbalizations; and (10) sketching, taking notes, thinking silently or otherwise time in which the participant appeared to be engaged in finding a solution. I defined this last activity as tantamount to 'solution-focused time'.[52]

[52] However coding the design sessions was only an approximation, for example, if a participant spent five seconds reading research materials followed by five seconds of making notes, I alternated the coding of the 10 second intervals between the two activities.

7.3.1.2: Debrief

During the post task, the participants were first asked to rate their solution from one to ten. Next, I asked what they would have done differently if they had more time, the hardest thing about the task, and which of the research materials were helpful to finding their solution. Participant answers were coded for recognition of perception related independent variables and support for the beneficial claims and concerns/criticisms.

7.3.1.3: Design description

First, the quantity and type of artifacts that the participants created are described. The participant discussion of design description was coded for recognition of perception related moderator variables and evidence of beneficial claims and concerns/criticisms. Additionally, I identified how participants defined mock users and attempted to determine each participant's object and domain expertise (I expected object unfamiliarity in a familiar domain).

Domain and object expertise was established by analyzing if the participant: (1) appeared to form a working model of the design complex enough to perform global simulation; (2) performed global simulation (indicating a breadth-first approach); (3) performed note-making only seen in conjunction with global simulation; (4) represented constraints by indicating in notes or sketches a framework or needs for the system; and (5) performed systematic expansion demonstrated by a similar level of abstraction for the elements of his/her design. See Table 19 for a list of expected and unexpected behaviors based on object and domain familiarity.

Table 19: Expected/unexpected behavior based on object and domain expertise

	Unexpected Unfamiliar object /unfamiliar domain	Expected behaivior Unfamiliar object / familiar domain	Unexpected Familiar object / familiar domain
Formation of a working model that is complex enough to support global simulation	No	Yes	Yes
Global simulation (indicates breadth-first versus depth-first approach)	No	Yes	No need
Representing constraints (deciding what the system needs to have)	Yes, but fewer constraints were formed than in the familiar domain	Yes	No, unless an unfamliar aspect of the object is discovered
Note-making (only seen with global simulation)	No	Yes	No need
Systematic expansion	No	Yes	Yes

7.3.2: Task findings

In this section, I describe the design, debrief, and design discussion sessions for each participant (sections 7.3.2.1 through 7.3.2.10). In each section, I review the participant's profile, HCD orientation alignment and empathy scores, how many projects in which the participant claimed to have used personas and/or scenarios, and how long he/she spent in the preamble portion of the study with the research materials. Next I present how he/she behaved in the design sessions (sections a), and what he/she said in the debrief portion of the study (sections b). Lastly, I present the participant's design and description (sections c) and then I analyze the design session (sections d).

7.3.2.1: Leanne (Experience level 1 of 10: low group)

Leanne was a young (25-30 years) female developer who self identified as a solution-driven strategist. Her HCD orientation alignment score was zero and her empathy scores were: (a) below the mean in perspective taking; (b) extremely high in fantasy; and (c) above the mean in empathetic concern and personal distress. Leanne claimed to have experience using personas in three projects but no experience with scenarios. She spent about five and a half minutes looking over the personas and

context scenarios in the preamble and was un-impressed with the presentation of the materials.

7.3.2.1a: Design session. Early in the design session, Leanne focused on the research materials, taking some notes. Later in the session she focused more on the solution, see Figure 46. She had a couple of problem-space related research questions early in the session: (1) she asked if Google's text search would make a good model for the design, in which I replied yes; and (2) she asked to see what Cyrillic text looked like and if words were typically longer or shorter than in English. In response I brought up a Cyrillic alphabet on a lab computer and told her that the words are typically longer than English (about 1.5 times as long).[53] Additionally, about 30 minutes into the session, she pulled her own phone out of her purse to use as a reference model for texting.

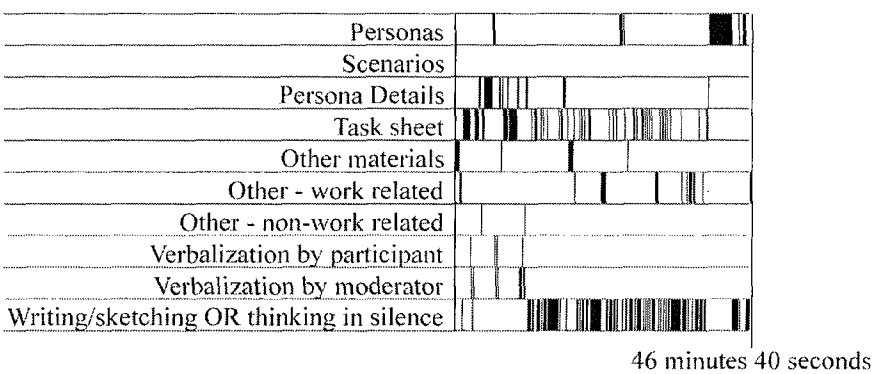


Figure 46: Leanne's task timeline

As the timeline demonstrates, Leanne focused on the personas details early in the session; recall that the persona details demonstrate how the personas are tied back to the data.[54] She also spent a considerable time throughout the session focused on the task definition sheet; recall that the task definition sheet reviewed the user requirements for the design and summarized the key research findings that supported the user

[53] In my experience localizing projects I was taught to use German as the target for the longest words. The rule of thumb I learned was to allow for text 1.5 to 2 times the length of English.

[54] See Appendix C for copies of the design study materials.

requirements. It was not until a concentrated period at the end of the session that she turned her focus to the persona documents.

Leanne never looked at the scenarios. In all, she spent 20% of her time looking at the persona related documents. She spent 40% of her time engaged in solution-focused time in which she was writing, sketching or thinking in silence. This was the smallest amount of proportional time spent writing and sketching of all ten participants. See Figure 47 for Leanne's task time distribution.

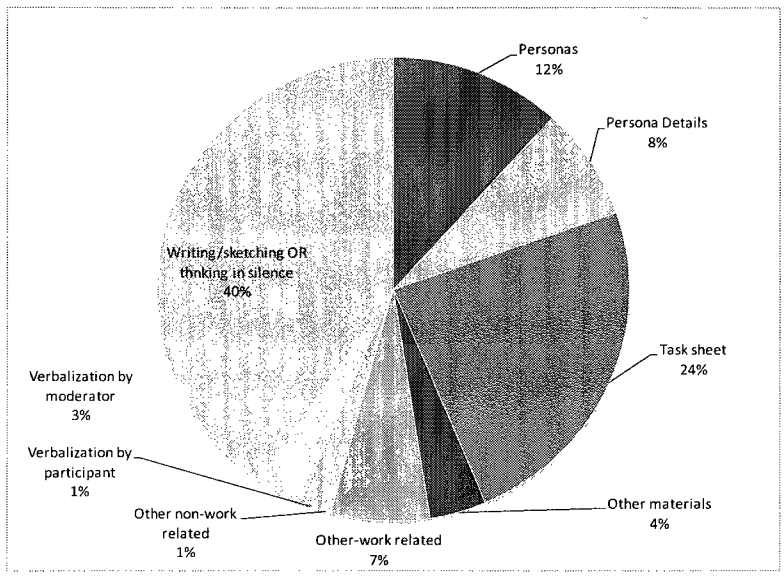


Figure 47: Leanne's task time distribution

7.3.2.1b: Debrief. Leanne rated her solution as a seven out of ten. When asked what she would have done differently, she implied that she would have created more detailed use case scenarios for the developer who was going to be responsible for programming the system.

- *What was helpful?* Leanne indicated that the personas (in which she spent 12% of her time) were "*pretty helpful*" but that she did not get much out of the persona details (in which she spent 8% of her time). She picked up the context scenarios and accurately stated that she "*did not really look at these.*"

- *What was the most difficult thing about the task?* Leanne focused on a lack of domain experience as the most difficult thing. She claimed that she "*did not know the technology involved in a texting system*," adding that she did not have "*huge cell phone experience.*"

7.3.2.1c: Design description. Leanne created two sheets of notes on $8\frac{1}{2}$ x 11 inch unlined paper. On the first page her notes were concerned with technical details and constraints related to the design, including the character limitation for text and what types of information (e.g. name, address etc.) were need for the directory. On the second page she created headers for each major user requirements which were copied directly from the task definition sheet. She listed sub requirements under each heading with possible text messages users might enter, see Figure 48.

The participant described her interaction design in this exchange:

Leanne	Well, for businesses to advertise info, they could just text certain key words, like 'create'. I guess I'm thinking of what people, and, their business name and they could create menus maybe separated by slashes.
Cynthia	And you note the key words here: create, create join...
Leanne	Yeah. Create edit delete, create join, info, view. Things like that... Or they could use words, like symbols. You know, like a plus for if you were trying to add, or view or something like that. Or, like, little emoticons for certain, I don't know. I have, like, a quick text menu on my phone and maybe you could somehow. ...The user could download or receive a menu of the key words already there, which would be really easy. And, yeah, I'm not really sure if a user name or password would be necessary to join a directory, or, you know, because, I mean, you have like...There's, like, a certain ID that comes with your phone. ...Right? Well, there's your phone number and...
Cynthia	Right. There's definitely a phone number.
Leanne	I don't really know...I don't need to password-protect anything.

businesses publicly advertise info via text

business text keywords create * to directory

business texts created menu

top level / 2nd level / 3rd / etc

business texts edit/delete * to directory

users to create + join shared directory

user text keywords create/join *

w/ un/pw? - necessary? phone number? - maybe nickn

user invites friends/contacts to join network

allow users contribute + rate businesses

user texts keywords add/rate *

option to send to network or specific contacts

save users review for user's access

allow users to retrieve rec + bus info

user texts info/review *

receives bus info

address
email
phone
hours
directions
distance

review

*'s 1-5
# of reviews
reviews from specific network
most recent review + date

Figure 48: Leanne's sample artifact

7.3.2.1d: Analysis of the design session.

- *Object and domain familiarity.* Leanne unexpectedly behaved as though she was designing an unfamiliar object in an unfamiliar domain (recall that I expected an unfamiliar object in a familiar domain).
    - *What was her working model?* While she indicated that she was basing her model on Google text-based search, there is no indication of a working model in her notes. Instead, her model is represented by a list of non-related constraints.
    - *Was there a formation of a working model complex enough to support global simulation? Was global simulation performed?* No, her design was comprised of a few drill-downs simulations that were completely disconnected to each other.
    - *Did she represent constraints?* Yes, she did list some constraints copied from the task definition sheets as notes; however it was not a detailed list.
    - *Did she perform note-making?* No, she did not make any notes to herself about things that needed to be remembered providing further evidence that there was a lack of global simulation.
    - *Was there evidence of systematic expansion?* No, the design was represented by a few unrelated drill-down pathways and scattered notes.
- *Perception related independent variables.* During the design session, Leanne clearly recognized the unfamiliarity of the audience when she asked to see the Cyrillic alphabet and wanted to know how long the words were in comparison to English. However, there were no considerations in her actual design, or notes made about this. No other perception-related independent variables (presentation, sample size, research methods, background of the research group) were recognized in her notes or discussion.

- *Dependent variables.* There is some evidence to support the focus claim. Leanne identified two user groups (business and user) that had different needs that aligned to the needs presented by the personas. While she indicated that the personas were helpful, there is no strong evidence in her design or subsequent discussion to support any of the other dependent variables.
- *Who were the mock users? How were they defined?* Leanne defined the users by role segments: business and users. While not directly aligned to the personas, the business segment aligned to the Parxat persona and the user segment aligned to the Shirin persona.

7.3.2.2: Lucy (Experience level 2 of 10: low group)

Lucy was a young (25-30 years) female designer who self identified as a solution-driven strategist. Her HCD orientation alignment score was three (high) and her empathy scores were: (a) much below the mean in perspective taking; (b) about at the mean in fantasy; and (c) slightly above the mean in empathetic concern and personal distress. She claimed to have experience using personas in one project. She spent about seven minutes looking over the personas and context scenarios in the preamble, and identified issues related to the fact that the materials represented a distant audience. Lucy's comments also appeared to support both the focus and communication claims of personas.

7.3.2.2a: Design session. Early in the session, Lucy focused on the task sheet, occasionally making notes. I was under the impression that she was not quite sure where to start and spent considerable amount of time looking at a blank sheet of paper with pencil in hand appearing to be deep in thought. Approximately 30 minutes into the session she seemed to become energized by an idea, and worked with her head down actively writing and sketching for most of the remaining session. There was one section in the middle of the session where she really focused on the context scenarios and one towards the end where she concentrated on the persona details. See Figure 49 for Lucy's task timeline.

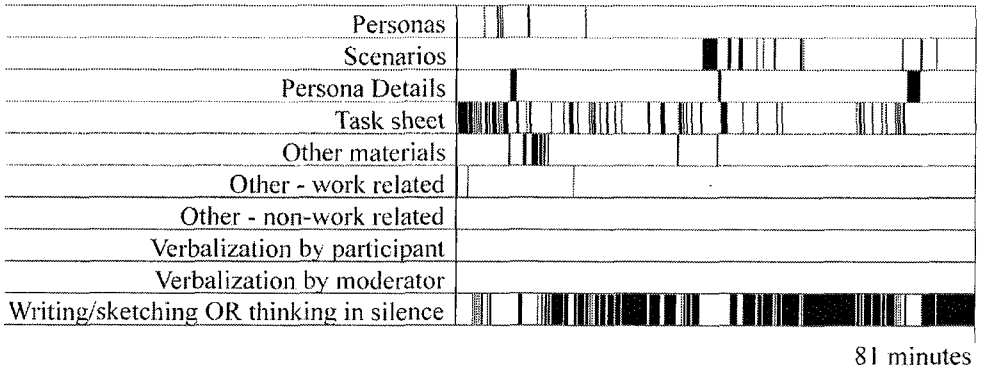


Figure 49: Lucy's task timeline

The participant spent most of her time (64%) focused on the solution (writing/sketching or thinking in silence). She also spent a considerable amount of her session time (18%) on the task definition sheet; most of this time was spent early on in the session. In all, Lucy spent 12% of her task time looking at the personas, context scenarios, and the persona detail sheets. See Figure 50 for Lucy's task time distribution.

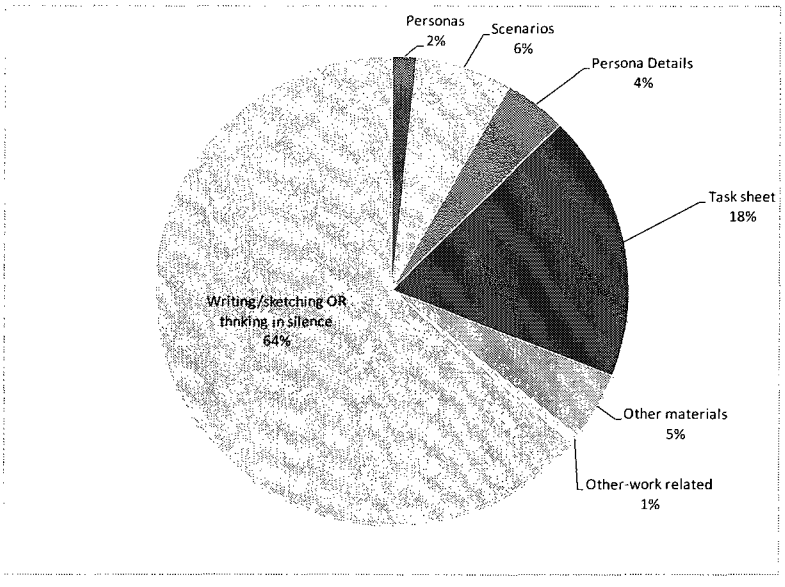


Figure 50: Lucy's task time distribution

7.3.2.2b: Debrief. Lucy rated her solution between six and seven. When asked what she would have done differently, she said that she would have made her solution

"*less messy*" and that she would have created sample messages and a detailed command list.

- *What was helpful?* She pulled out the task definition sheet (in which she spent 18% of her time) and declared it as the most helpful document among the research materials. She pointed to the context scenarios (6% of time spent) and said they were "*useful*" and more helpful than the personas. She provided evidence of the empathy claim in this exchange:

Lucy	These were useful in that it was good to be able to put myself in position of the users. Like what would this person need?
Cynthia	Okay. Because you had two different kinds of documents here, was there any particular type that was more helpful than the other?
Lucy	Probably the ones showing the interactions with the service. *(Scenarios versus the personas)*

- *What was the most difficult thing about the task?* Lucy really struggled with the mode of interaction stating. She described the hardest thing in this exchange:

Lucy	...trying to come up with something that would work both in strictly a text-based environment and a where you push a button, listen to the recording, push a button.

7.3.2.2c: Design description. Lucy created two sheets of notes and sketches on $8\frac{1}{2}$ x 11 inch lined paper and three sheets on the same size of unlined paper; see Figure 51 for sample artifacts of the unlined pages.

On the lined pages Lucy created sample user interactions in a script form in which the left column alternated between the owner of the text (User and M, assume symbolizing MoSoSo), and in the right column she identified what each would text. For example, Lucy wrote this exchange for the Roza persona:

User: ? Mechanic Seattle to MoSoSo
M: What type of car?
User: Skoda

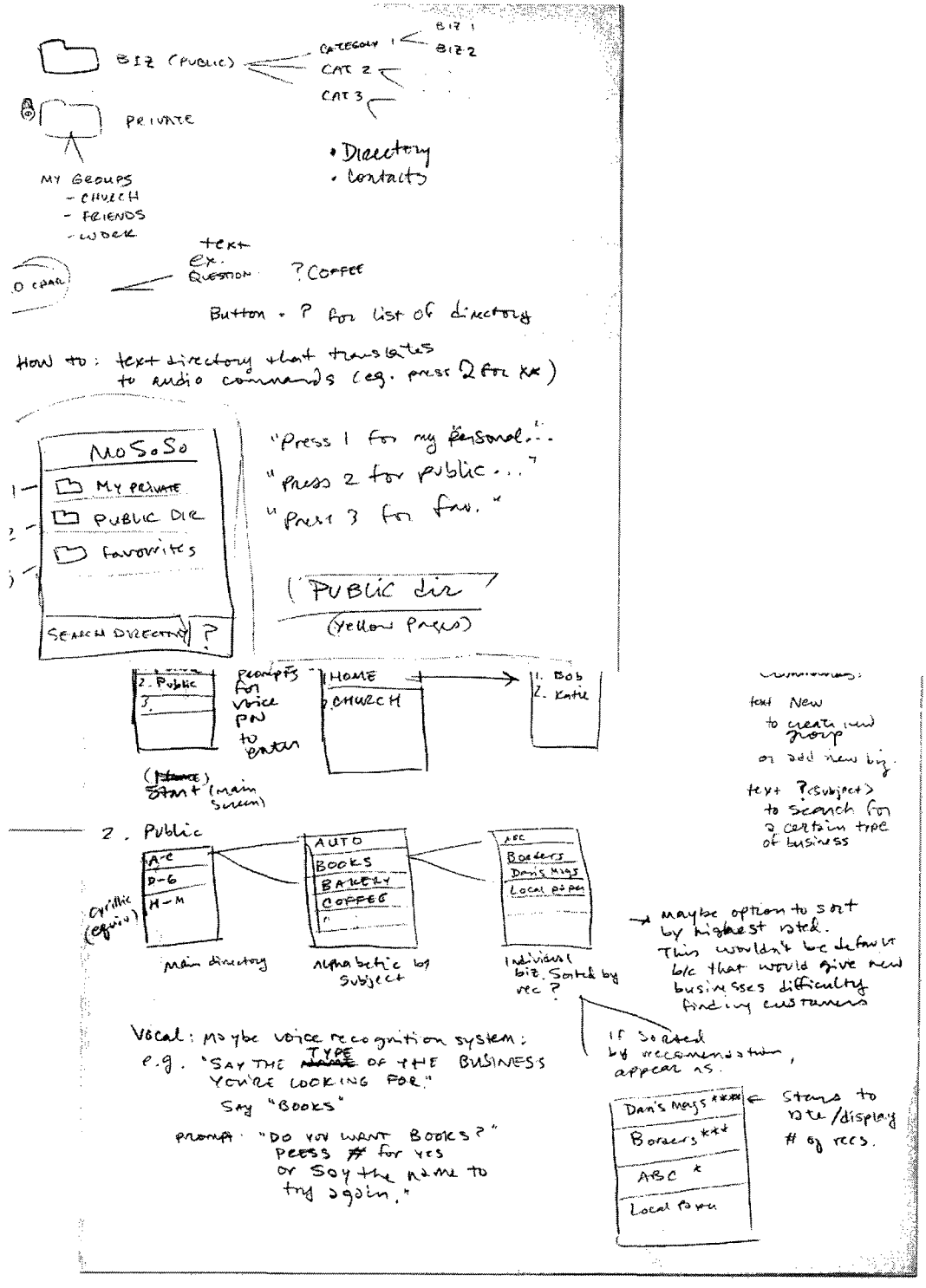


Figure 51: Lucy's sample artifacts

On the unlined pages, Lucy provided rectangles that represented screens and created sample drill-downs representing user interaction with the directory. She was fairly detailed in her explanation and specifically mentioned the unfamiliarity of the audience's language in this exchange:

Lucy	So, then if you selected the Public Directory you'd have, (and this is where the limitations of text or the button input came in) because you have… ...Of course, I don't know anything about Cyrillic, I don't know anything about Russian language, so I don't know how their alphabet works. But if it were English, I would think you would have to break it down into chunks, like A through C, D through G, H through M, etc.

7.3.2.2d: Analysis of the design session.

- *Object and domain familiarity.* Lucy behaved as though she was designing an unfamiliar object in a familiar domain as expected.
    - *What was her working model?* Her sketches suggest that she was using a smart phone or web-based system as a mental model because she included icons, buttons, and formatting that would not be possible with text. In her interaction system, the user first needed to determine if they were a (1) a business; (2) a private directory user; or (3) a public directory user. The user was then sent a home screen/control panel appropriate for what type of user they were. The sample artifact displays a directory home screen in which four choices and a help button are presented to the user: (1) public directory; (2) private directory; (3) favorites and (4) a search. In subsequent sketches, she detailed the secondary screens.
    - *Was there a formation of a working model complex enough to support global simulation? Was global simulation performed?* Yes, there is evidence of global simulation in her scripts on the lined pages where she tested how her solution might work.

- *Did she represent constraints?* Yes, she listed the needs for the public and private directories, and she clearly outlined requirements for businesses to list information (edit description, edit location, etc.). These are all drawn in rectangles representing phone screens.
- *Did she perform note-making?* Yes, she has many notes about possible options and ideas.
- *Was there evidence of systematic expansion?* Yes, but because of the time constraint, she was not able to sketch out the business path in as much detail as the public and private paths.

- *Perception related variables.* Based on Lucy's discussion about her design, language differences for the unfamiliar audience were a concern. However, there is nothing in her notes to reflect this concern. No other perception-related independent variables were recognized.
- *Dependent variables.* There was support in her discussion for the claim of empathy when she spoke of how the context scenarios helped her "*put myself in position of the users*." There is also evidence supporting the focus claim in that she developed her system for different types of users who were represented by the personas: business (Parxat), private directory user (Shirin), and public directory user (Roza and Parxat). However, she never included the three user groups in her discussion; therefore, I did not code for evidence of the communication claim. There was no strong evidence in her design or subsequent discussion to support the remaining dependent variables.
- *Who were the mock users? How were they defined?* Lucy defined the users by role segments: business, private and public. The roles aligned to the personas presented in the context scenarios.

7.3.2.3: Lewis (Experience level 3 of 10: low group)

Lewis was older than the other members of the low experience group (36-40 years old). He was a designer who self identified as a solution-driven strategist. His

HCD orientation alignment score was two (about at the mean) and his empathy scores were: (a) below the mean in perspective taking, fantasy, and empathetic concern; and (b) above the mean in personal distress. Lewis did not have any previous experience using personas or scenarios. He spent the shortest amount of time (about 2 and a half minutes) looking over the personas and context scenarios in the preamble, truncating the preamble so that he could get right to work.

7.3.2.3a: Design session. After spending a small amount of time looking through the entire folder of materials, Lewis concentrated on writing and sketching (solution-focused time). In the first third of the session, he would take small breaks from writing/sketching to look at the research materials focusing primarily on the persona detail sheet. As the session continued, he looked at the research materials for only small segments of time, see Figure 52.

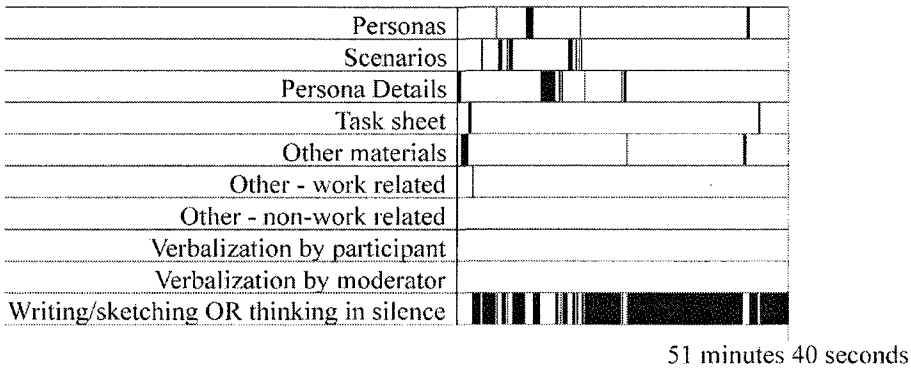


Figure 52: Lewis's task timeline

Of the low experience group, Lewis spent the most proportional time (77%) writing/sketching or thinking in silence, i.e. in solution-focused time. He spent approximately 18% of his time looking at the personas, context scenarios and persona detail sheets see Figure 53.

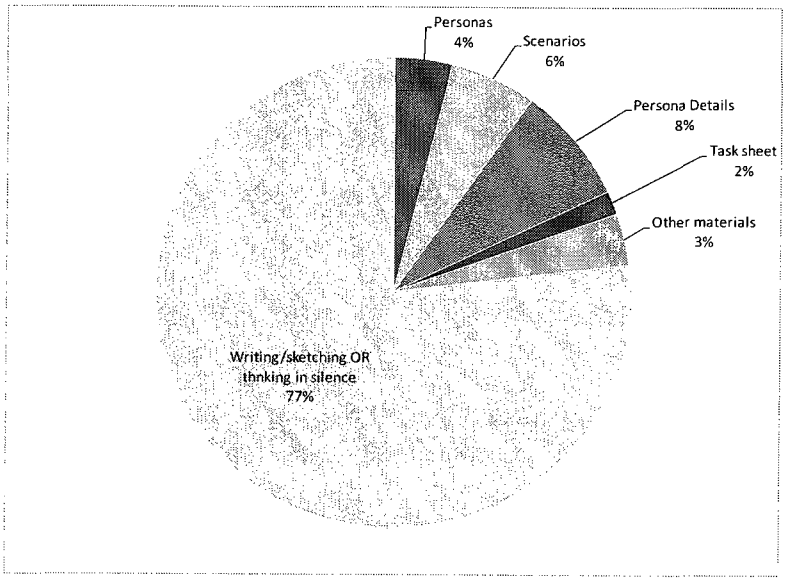


Figure 53: Lewis's task time distribution

7.3.2.3b: Debrief. When asked to rate his solution, Lewis replied that his solution was "*pretty initial but I would say seven.*" Similar to Leanne, he would have added more detail if he had more time, stating that, "*I would have completely sketched out the whole system.*"

- *What was helpful?* Lewis felt that the schedule and budget documents "*were cool but totally worthless*" and that he "*used the people intensely*" as he put his hands on the persona details (8% of his time) and the context scenario (6% of his time) stacks. He felt that the context scenarios were useful in *"knowing what they were doing*" and that the personas were helpful "*as far as the languages that they were using.*" He found the narrative portions of the personas more helpful than bulleted technical information claiming, "*Because it's not really pertinent to what I was doing.*"
- *What was the most difficult thing about the task?* Lewis felt that the "*most difficult thing about the task was deciding where to put the different components that I needed.*"

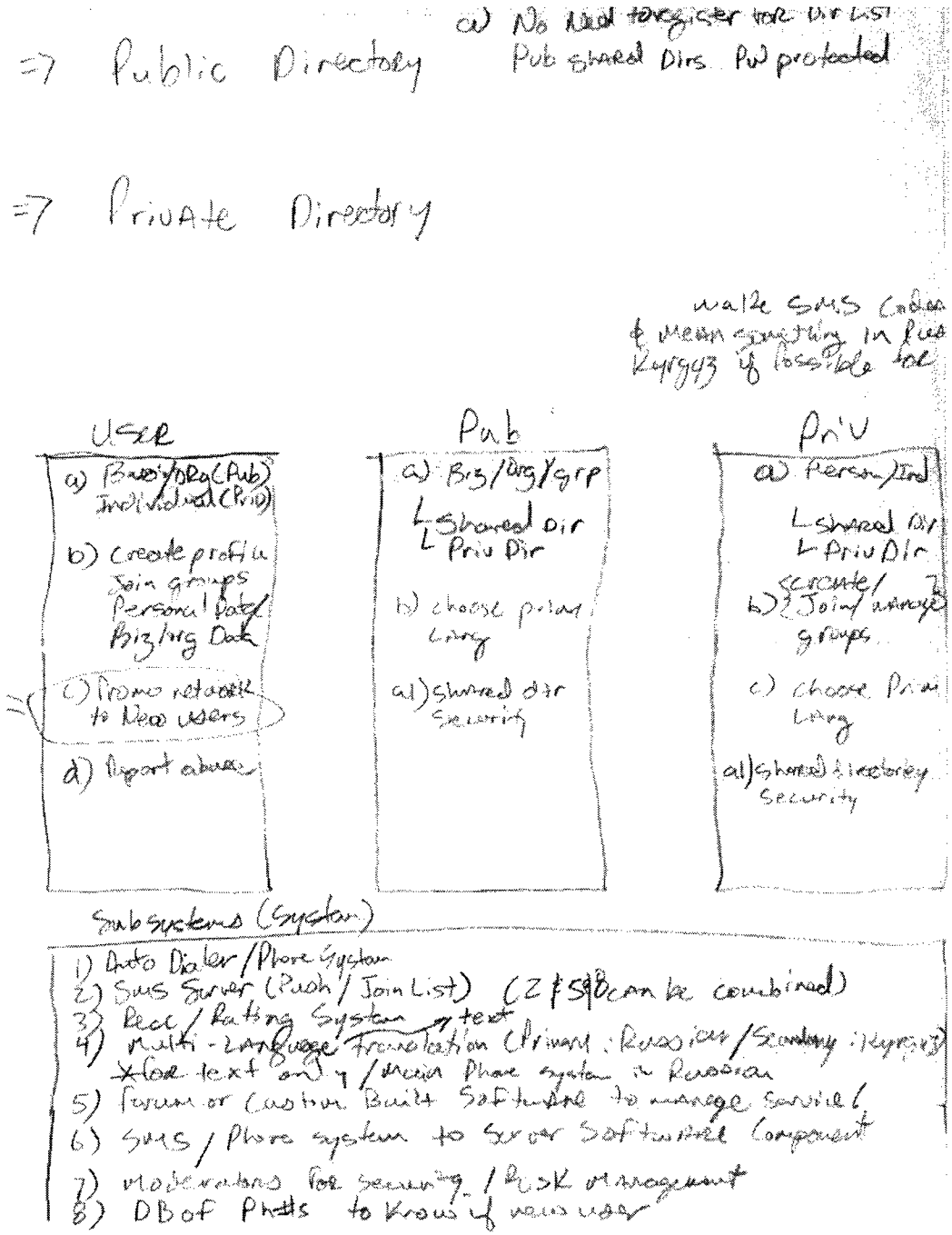


Figure 54: Lewis's sample artifact

7.3.2.3c: Design description. Lewis created three sheets of notes and sketches on 11 x 17 inch gridded paper. He broke up the interaction into three components of

user, public directory and personal account. In the user component the end user would sign in, set up preferences and create private directories. The public directory "which includes all the businesses and organizations that want to be listed publicly." The personal account was described as being "where you manage your directories and stuff." See Figure 54 for Lewis's sample artifact.

Lewis further describes part of his design in this exchange:

Lewis	And I just went over these three things and tried to break out what might happen in them and then the subsystems that were needed to build this.
Cynthia	Okay. So...what the user sees is in the public directory?
Lewis	Right here, the first one, is how you sign up.... And sign in. ...The second one is the Yellow Pages-type public directory.... And the third one is your personal private one, which would be used for, like, FaceBook on social networking.

7.3.2.3d: Analysis of the design session.

- *Object and domain familiarity.* Lewis's behavior suggested that he was designing an unfamiliar object in a familiar domain.
    - *What was his working model?* In Lewis's three component concept, the user would identify what they wanted to do first through a telephone tree. For example, the user was expected to dial 1 for the 'user' interaction. At which time the system would return a text message that would include all the user options including creating profiles, joining groups, and reporting abuse. A different home screen was sent to the user if they dialed 2 for the public directory or 3 for private directories.
    - *Was there a formation of a working model complex enough to support global simulation? Was global simulation performed?* Yes, while the concept was not presented at a high level of detail, it was globally conceived.

  - *Did he represent constraints?* Yes, he represented the constraints from the task definition sheet categorized under his three components.
  - *Did he perform note-making?* Yes, there are multiple notes about subsystems and SMS codes. In one note he reminds himself about language differences: "*make SMS codes catchy and mean something in Russian and Kyrgyz if possible.*"
  - *Was there evidence of systematic expansion?* Yes, while still very abstract, all of the elements are detailed at a very similar level.
- *Perception related variables.* The one consideration to the distant audience was in two notes in Lewis's sketches about the system needing to be in Russian. No other perception-related variables were recognized in his design or discussion.
- *Dependent variables.* While Lewis reported that the scenarios were useful in "*knowing what they were doing*," and that the personas were helpful "*as far as the languages that they were using*," there was no strong evidence in his discussion or artifacts to support persona/scenario claims or criticisms. As indicated below, he did segment users, but not in a way that aligned to the personas that were presented; as such, the focus claim was not identified.
- *Who were the mock users? How were they defined?* Lewis defined the users by role segments: user, private and public. The roles did not align to the personas presented in the context scenarios.

7.3.2.4: Luke (Experience level 4 of 10: low group)

Luke was the youngest participant at 22 years of age. Luke identified himself as a solution-driven designer. His HCD orientation alignment score was four (the highest possible score) and his empathy scores were the lowest of all the design study participants in that he scored below the mean in all the dimensions and scored the lowest among all participants in perspective taking, empathetic concern and personal distress. He did not have any previous experience using personas or context scenarios. He spent a short amount of time (about 3 minutes) looking over the personas and

context scenarios in the preamble, expressing that the scenarios were too much text. In his reaction to the personas, he seemed to be confirming stereotypes he had about users primarily based on age.

7.3.2.4a: Design session. Much like what I observed with Lucy, I was under the impression that early in the session Luke was not sure where or how to start. As the timeline demonstrates, see Figure 55, early in the session he spent a long time studying the task definition sheet. The other material he focused on early in the session was the telephony definition sheet. After focusing on those two documents, he then concentrated on the personas. It was not until about half way through the session that he began to spend most of his time writing and sketching.

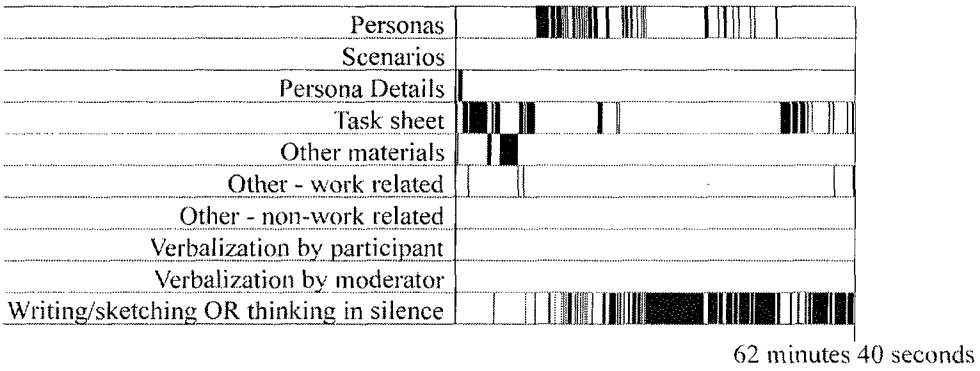


Figure 55: Luke's task timeline

Luke spent a little over half his time (54%) writing/sketching/thinking in silence. He looked at the personas and persona detail sheets for about 19% of the task time, and the task definition sheet for another 19% of his time, see Figure 56. Like Leanne, he did not spend any time looking at the context scenarios; recall that both these participants felt that the scenarios were too textual and in Luke's words, "*hard.*"

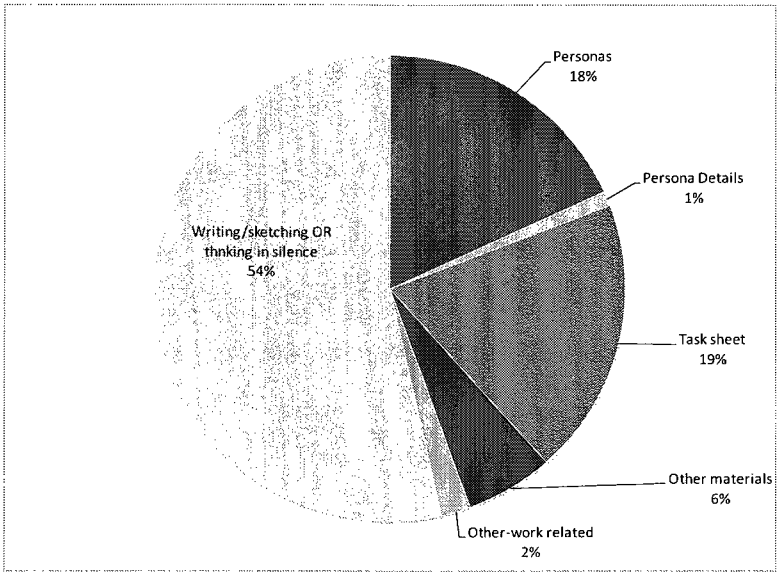


Figure 56: Luke task time distribution

7.3.2.4b: Debrief. Luke rated his solution at an eight. When asked what he would have done differently if he had more time, he would have involved people he knew.

Luke	I would ask others to see what they would think about it and if they think it would actually be viable.
Cynthia	Okay. And what others would you ask?
Luke	Friends, family.
Cynthia	Any particular friends or family?
Luke	Actually, it would probably be mostly just my close friends... Those that are really into social networking.

- *What was helpful?* Luke felt that the personas (in which he spent 18% of his time) were the most helpful "*because I wanted to see if they actually use text.*" He declared all of the other materials as not helpful, stating that, "*Everything else, it didn't matter to me.*"
- *What was the most difficult thing about the task?* Luke felt that the "*The most difficult thing was it's not a visual-based software, like an iPhone application. It's dealing with just text.*"

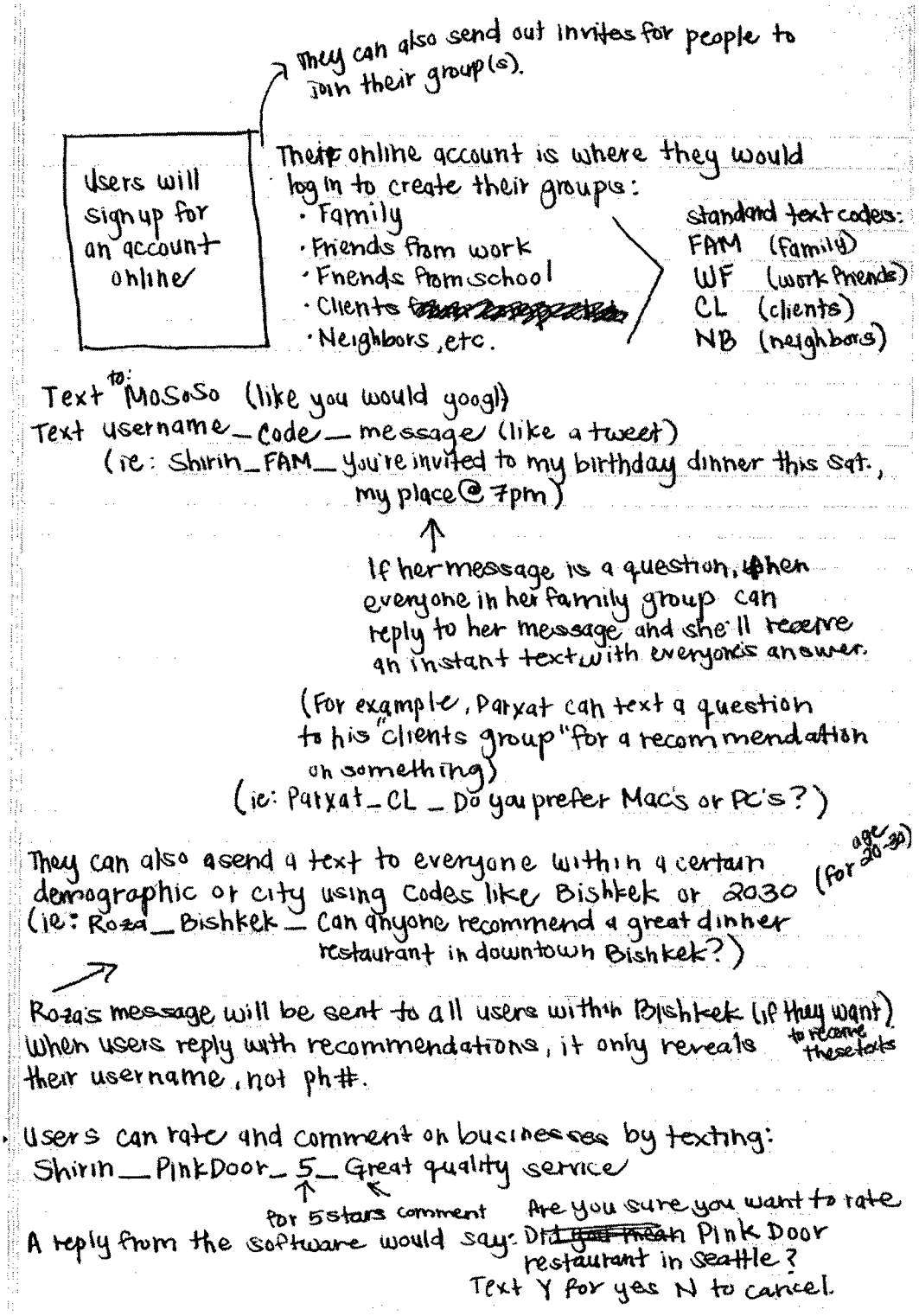


Figure 57: Luke's sample artifact

7.3.2.4c: Design description. Luke created two sheets of notes and sketches on $8\frac{1}{2}$ x 11 inch lined paper, see Figure 57. There was no sense of an overall design; instead he presented a series of unrelated ideas. He also completely disregarded the key requirement, that the system be assessable through text, and required users to set up an account through the Internet.

Luke used Google's text search (like Leanne had) and Twitter as a model for his system. In this exchange Luke explains his solution:

Luke All right. So, in order for my whole thing to work, users will have to have internet access to set up an account....

That way they can go ahead and create groups that they can organize. They can also use internet to send out invites to family or friends to be a part of their group directories.

Each group is...there are different standardized quotes for each groups of family. Designer text code would be: FAM, friends from work: WF, clients: CL, and the software system will have that entire list of standardized text codes.
...So, what I realized is that a lot of their goals were to seek out recommendations from people in certain groups. So, they could be on their cell phone, and they would text to, say, that's the number to text to every time you're using the software system.
...It's, kind of, like you would text Google to say, "Hey, I want to . . . Where's Broadway Grill, Seattle, WA?" And it will return a response...So, that's the number that you would be texting. So, for instance, there's a standard format of texting. So, you'd put your user name first, to let the software know that, hey, I'm using this program right now. You'd use a code; say FAM. So, I want to send out a message to my entire family directory, so it would be, kind of, like a Tweet, like Twitter. So you would write, "You're invited to our birthday dinner this Saturday at my place at 7:00 p.m." Everyone in my family group will receive this message.

In this passage he is pointing to the Shirin persona when he talks about 'her'. This passage is evidence to support the claim of communication. There is also some evidence that he his identifying and separating user needs based on the segmentations presented in the personas.

Luke	If her message is a question, then a member on their family group can reply to her message, and she'll receive an instant text with everyone's answer, almost instantaneously. For example, for him, he wants to seek advice for his computer club, recommendations, or whatever. So, for example, Parxat can text a question to his client's group for a recommendation on something for his business. It's, kind of, like how Twitter . . . A lot of businesses use . . . It's, kind of, like a focus group at their fingertips. They send out a question everyone can respond back to.

7.3.2.4d: Analysis of the design session.

- *Object and domain familiarity.* Luke's behavior suggested that both the object and the domain were unfamiliar (like Leanne); again, this was not expected.
    - *What was his working model?* His notes and explanation did not indicate a working model beyond a series of disconnected ideas.
    - *Was there a formation of a working model complex enough to support global simulation? Was global simulation performed?* No, his design was a series of disconnected messages.
    - *Did he represent constraints?* Yes, but they are not as detailed as would be expected from a familiar domain.
    - *Did he perform note-making?* No, his notes do not represent reminders or things to think about.
    - *Was there evidence of systematic expansion?* No, the design was represented by a few unrelated drill-down pathways.
- *Perception related variables.* There were no considerations in Luke's design for distant audience. In fact, by suggesting that the Internet be required he

completely disregarded one of the critical needs of the Kyrgyz users. No other perception-related variables were recognized.

- *Dependent variables.* There was evidence to support both the focus and communication claim of personas in both his discussion and notes. Luke specifically mentions all of the personas by name in his notes. However, he disregards the needs expressed in the context scenarios and instead imagines them in a local context which supports the stereotype confirmation criticism (i.e. the personas were just empty receptacles in which he filled with his own assumptions). For example, he located Shirin's search in Seattle and made an assumption that she would want to find a restaurant when he wrote, "Users can rate and comment on businesses by texting, Shirin_PinkDoor_5_Great quality service." There was no strong evidence in his design or subsequent discussion to support any of the other dependent variables.
- *Who were the mock users? How were they defined?* Luke defined the users by the three persona names; however, he applied his own assumptions to the users while disregarding much of the actual research.

7.3.2.5: Malcolm (Experience level 5 of 10: medium group)

Malcolm was 41-45 years of age, and claimed to be a developer; however, recall that his job description appeared to be more aligned to a designer. He self identified as a problem-driven strategist. His HCD orientation alignment score was one (below the mean) and his empathy scores were above the mean in all dimensions except for fantasy (in which he had one of the lowest scores). Malcolm had the highest empathetic concern score of all the participants. Malcolm did not have any previous experience using personas or scenarios. He spent the longest amount of time among all the participants (about 14 minutes) looking over the personas and context scenarios in the preamble, primarily reading the documents word for word out loud. His reaction to the personas supported the empathy claim and clearly recognized that the documents represented a distant audience.

7.3.2.5a: Design session. At the beginning of the session, Malcolm asked if I wanted him to continue to think aloud through the task. As with all the participants, I explicitly suggested that they should not think aloud through the task unless it represented a way in which they might typically work. Disregarding my suggestion, Malcolm performed think-aloud throughout the task. The task timeline demonstrates that Malcolm began writing/sketching immediately only turning to the scenarios for intermittent times throughout the first half, see Figure 58.

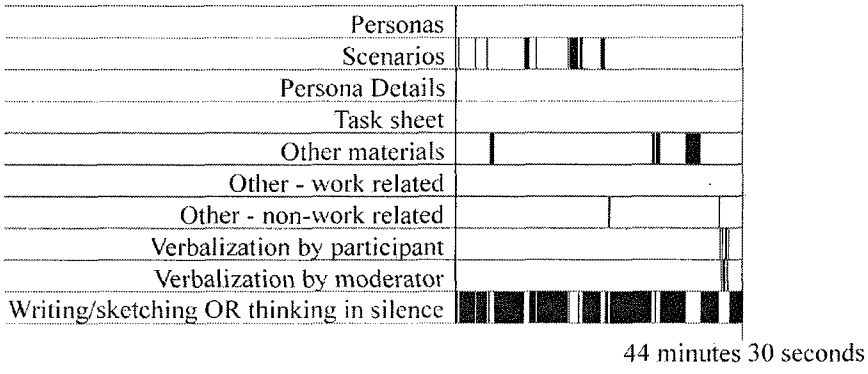


Figure 58: Malcolm's task timeline

Malcolm also exhibited two other unusual behaviors when compared to the other nine participants: (1) he spent the shortest amount of time on the task (44 minutes and 30 seconds which was less than 50% of the allotted time); and (2) he spent a large amount of his time (9%) on the schedule and budget documents making notes on the documents.

Malcolm spent most of his time in solution-focused time, writing/sketching and verbalizing what he was writing or sketching in the process (78%). He read over the context scenarios for 9% of his time, and did not look at the personas or persona details at all, see Figure 59. While he did not look at the personas or personas details throughout the task, his verbalizations indicated that he was concentrating on the three persona users by referring to them by name, supporting the communication claim of personas. For example, when verbalizing about Parxat's interaction with the system, he

stated, "*I would think that the first set of things that Parxat might enter would be his business information.*"

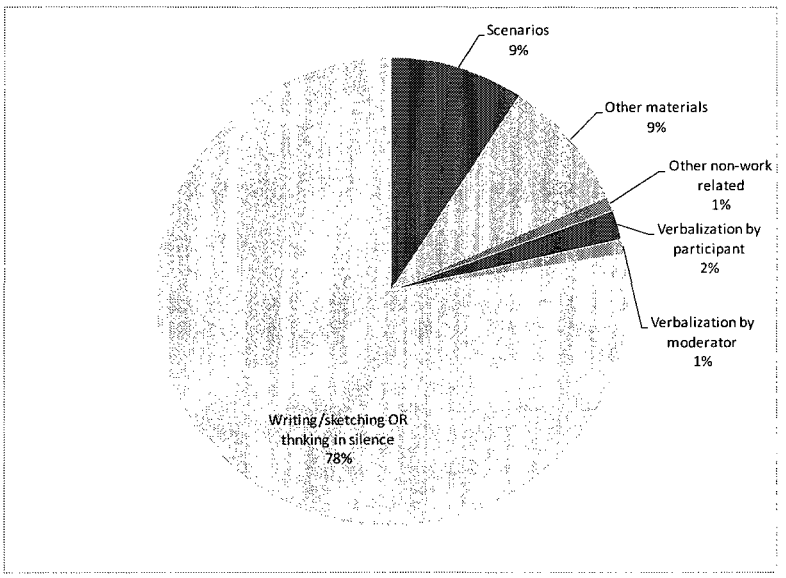


Figure 59: Malcolm task time distribution

7.3.2.5b: Debrief. Malcolm rated his solution as deserving an '85%'. When asked what he would have done differently, his answer focused on small scale language issues and what he would have done if this was a website.

Cynthia	And if this was a project that you were actually given a couple weeks to do, what would you do differently? Just in, kind of, at a high-level view?
Malcolm	Well on websites I'm used to actually mocking up the user interface. One of the questions that we often come to is, how many characters do we need for a first name? How many characters do we need for a last name? This is also, kind of, a local issue, because the Russian language is, Cyrillic language is, those are the longest languages. The words are, I mean, the words are often compound words and they tend to have a lot of letters in them.

- *What was helpful?* When I asked Malcolm which research materials he found most helpful, he seemed to think that I was asking for his assessment of the research materials suggesting that I conduct a focus group for people to

comment on the materials. When I tried to refocus Malcolm on what he personally found the most helpful in his design, he did not directly answer the question and instead he critically reviewed the research material. For example, he picked up the map and claimed he would have liked to have seen elevations to determine where cell towers might be located, he picked up the budget and schedule sheets and declared that the budgets were not large enough and the schedule was not generous enough, finally when he picked up the personas and spoke about concern for literacy rates. Since Malcolm and I did not communicate effectively on this question, I dropped the query and moved on with the design debrief.

- *What was the most difficult thing about the task?* Malcolm felt that the most difficult thing was the time constraint. This was inconsistent with his behavior since he did not use his allotted time for the design task. He also felt that it was difficult to work alone and it would have been easier if there was an entire team working on the project in this passage:

  Malcolm ....have my programmer, have somebody who has some local expertise and to have the mastermind group here to actually discuss, give me feedback, sounding board.

7.3.2.5c: Design description. Malcolm created one page of notes on 11 x 17 inch unlined paper, see Figure 60. He divided the page into three areas; each area was headed by one of the persona names. Under each persona heading his notes represented a series of interactions with the system by a block text from the system, an arrow, and then a block of text to the system. The sketched interactions loosely followed one of the context scenario storylines for each persona. He also drew one screen in which he was clearly using a web metaphor because he drew in form fields that are not possible in a text interaction.

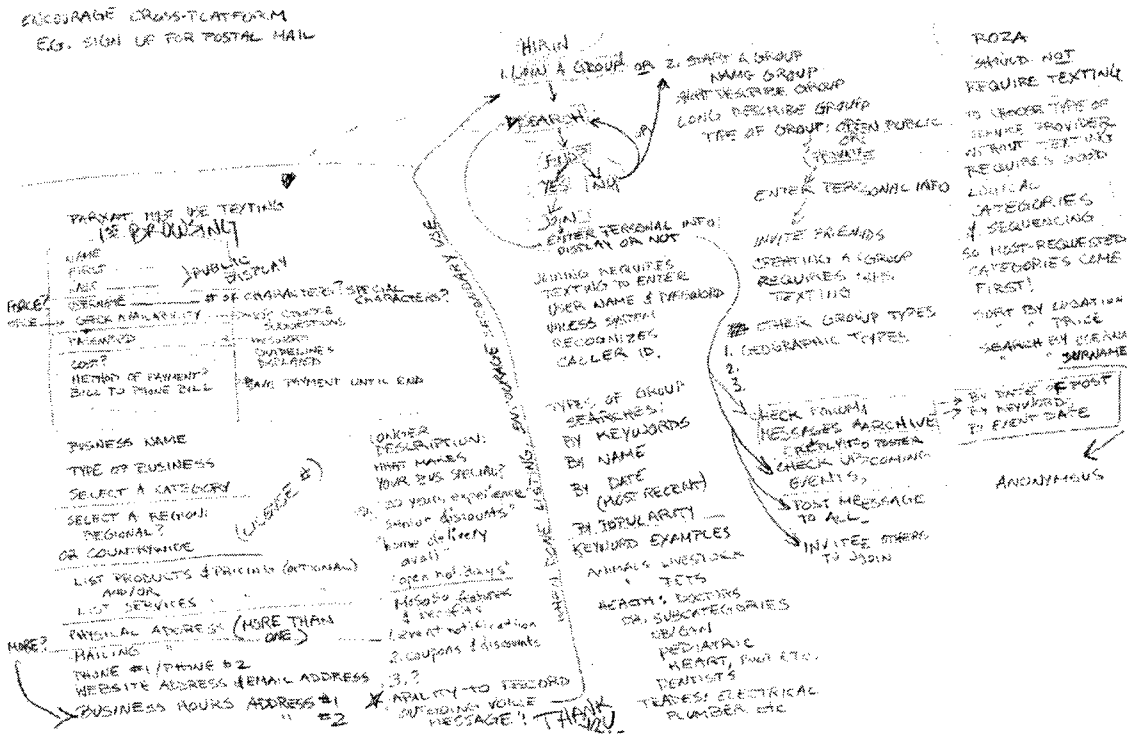


Figure 60: Malcolm sample artifact

7.3.2.5d: Analysis of the design session.

- *Object and domain familiarity.* Malcolm behaved as though he was designing an unfamiliar object in an unfamiliar domain. This was unexpected especially given the participant's reported level of professional experience (over ten years).
    - *What was his working model?* In his one page of notes, he creates a drill-down for each persona in which he loosely follows one of the scenarios.
    - *Was there a formation of a working model complex enough to support global simulation? Was global simulation performed?* No, there was no sense of a global design in which all of the elements were connected.
    - *Did he represent constraints?* Yes, but they are not as detailed as would be expected from a familiar domain.

- *Did he perform note-making?* There were many notes in the drill down, but they are not reminder notes; instead they suggest user alternatives.
- *Was there evidence of systematic expansion?* No, the design was represented by a few unrelated drill-down pathways.

- *Perception related variables.* During the design debrief, Malcolm talked about making design considerations for the Russian language; however, there are no notes about this in his work. No other perception-related variables about the personas and context scenarios were recognized.
- *Dependent variables.* The communication claim was supported in Malcolm's discussion about his design, for example:

Malcolm So, I, kind of, broke up my page into these three different categories. So, we've got the practical user over here. Parxat and he's texting. Shirin is over here. If she's going to join a group, she maybe doesn't need to use texting. And Roza should not be required to use texting, partly because of the literacy question.

There is also some support for the empathy claim in that the participant expressed concern about the ability to search anonymously to protect user privacy. For example in this description of Shirin starting a group:

Malcolm So, she's going to start a group. She's going to name it. She's going to give it a short and long description. She's going to say whether the group is public or private. It may be, like, this is a group for my family. Only the people I invite can join. It's very much like a social network.

The focus claim was also supported, in that his design was separated into three sections based on the needs of the three user groups. However, Malcom also made several assumptions about the users that were not supported by the research materials, suggesting support for the stereotype confirmation criticism. For example, he decided that Shirin played the accordion demonstrated by this exchange:

Malcolm So Shirin wants to ...is thinking she wants to join a group about music.
...So, she's going to Search, Music, and maybe she's going to search sub-categories, and maybe she's not going to find an accordion group.

And in this exchange he made an assumption that Roza would want to search for birth control:

Malcolm Roza definitely, especially if she's searching for birth control or something, might want more privacy and the ability to be anonymous.

Accordion playing and birth control were not communicated in the research materials. In sum, Malcolm demonstrated that personas could meet some of their claims simultaneously with the criticism of stereotype confirmation.

- *Who were the mock users? How were they defined?* Malcolm defined the users by the three persona names; however, he applied his own assumptions to the users.

7.3.2.6: Marco (Experience level 6 of 10: medium group)

Marco was 30-35 years of age and was working as a designer at a large software company. He self identified as a solution-driven strategist (the only solution-driven strategist in the medium or high experience groups). His HCD orientation alignment score was one (below the mean) and his empathy scores were above the mean in all dimensions except for empathetic concern; he had the highest personal distress score of all the participants. He was very experienced using both personas and scenarios and had claimed to have used them for eight projects over the last ten years. He spent approximately seven and a half minutes looking over the personas and context scenarios in the preamble in which he focused on what he felt the technology meant to the audience. An audience he acknowledged as being unfamiliar. There was also support for the focus claim in the participant's preamble discussion.

7.3.2.6a: Design session. Like Malcolm, Marco spoke throughout the task session; however, unlike Malcolm, Marco directed his conversation to me. In other words, rather than simply dictating out loud what he was writing in his notes (like Malcolm), Marco would lean back to look at me around the partition, make a comment, pause for a response, and then announce he was going to write the comment down (whether I responded or not). This created an odd dynamic for the session since I had explicitly chosen to sit on the other side of the lab partition so that I would not be involved in the design sessions. While I limited my responses to 'okays' and 'uh-huhs', the conversational mode of the session was unique among the ten studies. On later reflection, I felt that the room arrangement might have encouraged direct conversation with me.

Since I was trying to reproduce a design situation that might be similar to what they would encounter in their work, I changed the room arrangement for subsequent studies to discourage conversation with me. For the first three studies (Maria, Marco and Leanne), the participants could partially see me around the partition working on my laptop if they leaned back in their chairs. To minimize future interaction during design sessions, participants were moved to the far corner so they could not see me at all, see Figure 61. No other participants attempted to engage me in conversation during design session (beyond questions) once the room arrangement was changed.

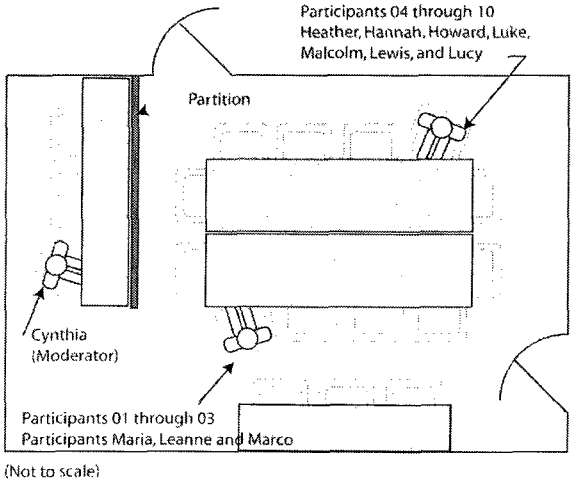


Figure 61: LUTE lab floor plan during the design task portion of the studies

Since Marco had such a different style from other participants, it is difficult to make direct comparisons in regards to the design session. As the timeline demonstrates, even after I reiterated that there was not need to think aloud (TaP) about 40% through the session, he was not detoured from direct conversation, see Figure 62. Additionally, the conversational nature of the session might have inhibited the use of personas and context scenarios. As the timeline demonstrates he only looked at the scenarios for two brief segments.

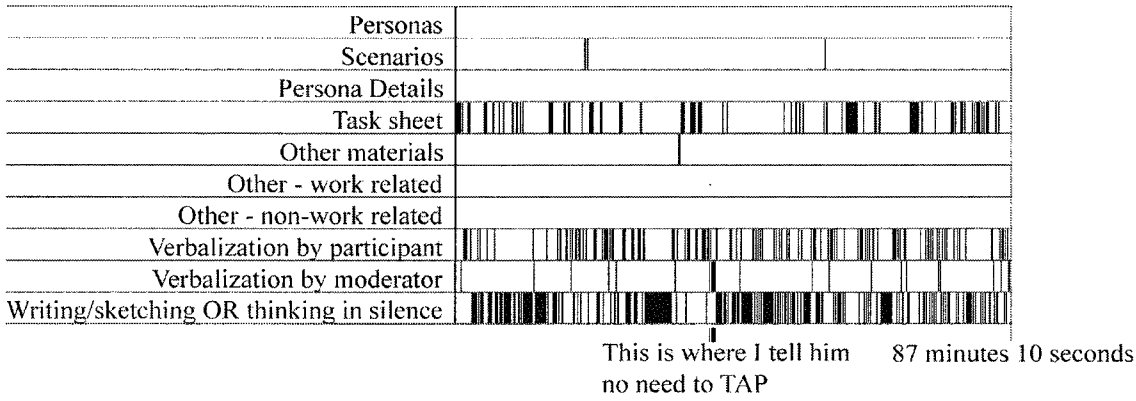


Figure 62: Marco's task timeline

The one research document that Marco did focus on was the task definition sheet. He spent almost the entire session in a repetitious pattern of holding the task sheet in one hand and reading the sheet, verbalizing about possible solution vectors, and then making notes about his thoughts. The following is an example of Marco's common pattern:

Marco: So, maybe there's search versus creating a group or something. So, here looking for something versus creating something. And the same kind of layout for the Business section; search versus creating something. There's a bullet about allowing users to contribute and rate businesses. I think contribute falls under, kind of, the creation category and rate should maybe be part of the search, or, like, a sub-category of Search. So, I'm going to draw a little connection; a little node from search that features rating, and the same thing applies, I think, to both the Social and Business Search and Create.

Made a note.
Looked at the task definition sheet.

Marco: So, there is a point about in the key findings that have a history of strong alliance and social networks. So, maybe it would be interesting if under the social aspect you can find a person and then you could see what that person recommends. I don't know how to fit this into my little tree yet, so I'll just make a little note about using people as a way to find recommendations as opposed to just doing it via business categories.

Made a note.
Looked at the task definition sheet.

Marco: I think there's a third key finding this strong upper trend in mobile phone use.... So, I'll make a little note about trying to work in some of that stuff.

Made a note...etc...the pattern continued.

Again, because of the unique nature of the session, Marco's time distribution was not directly comparable to the other participants. Clearly, as the exchange above demonstrates, as he directed his conversation towards me, he also considered solution vectors; therefore, in Marco's case the writing/sketching/thinking in silence time could be combined with verbalizations to create a larger 'solution-focused time'.

Rather than try to interpret his motivation behind his verbalizations as 'solution-focused time' versus some other motivation, I simply coded for when he made verbalizations and when he wrote notes/sketched or (on the rare occasion) thought in silence, see Figure 63. As stated above, he spent a large amount of time gazing and reading over the task definition sheet and only 1% of his time looking at the scenarios. He did not look at the personas and the personas' detail sheet at all; nor did he refer to the personas by name once in the task session. Instead, the audience was abstracted into business and social users in his conversation.

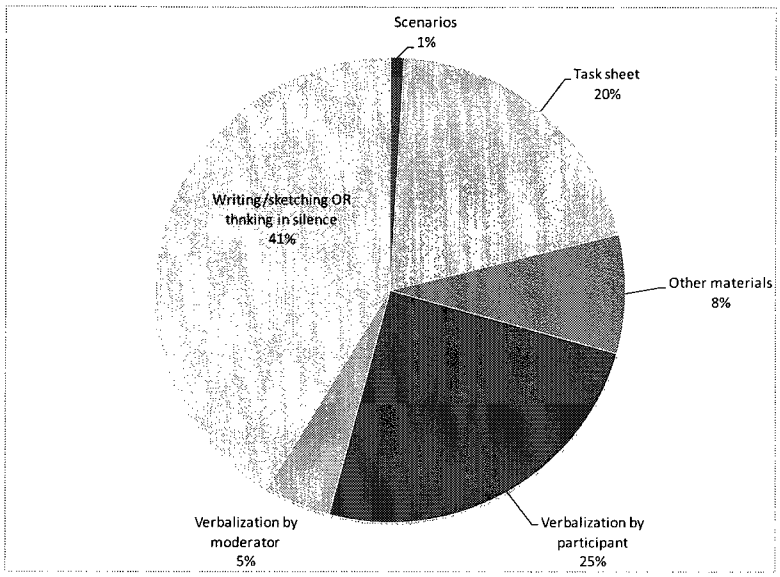


Figure 63: Marco's task time distribution

7.3.2.6b: Debrief. Marco rated his solution between seven and eight, declaring that it was not detailed enough to warrant anything higher. He would have "*fleshed out more detail*" if he had more time.

- *What was helpful?* Marco accurately claimed to be drawn to task definitions sheet "*a lot.*" Recall that Marco was the most experienced among all participants in using personas and scenarios and that he only spent 1% of his time looking at the scenarios during the design task; he did not look at the personas or the personas' details at all. When he expanded on what he found the most useful, he expressed that the personas and context scenarios were background information that he used to frame the problem, similar to what he is used to getting in his work, but he implied that they were not helpful during the actual design session.

Cynthia	In reference to the research materials, which materials did you find helpful? What did you find yourself going back to over and over again? What did you not find helpful?
Marco	The yellow sheet I seemed to be going to a lot.*(The task definition sheet was yellow).* ...These interaction ones. *(These were the scenarios)*

...I think it's probably because I'm pretty familiar with these kinds of things. I didn't go back to a lot. I think, once I read them I kind of knew the basics behind these interactions. They seemed very, kind of, familiar.

Cynthia Okay. All right. And seem familiar how?

Marco It just seems like, you know, there's a task that they want to accomplish. There are certain problems preventing that. You know, that whole, kind of, narrative is kind of familiar to me.
...So, I, kind of, just took it in right away and I kind of understood it.
...So, I didn't' have to go back to it a lot.
...The personal profile stuff I, though, was pretty interesting. That kind of helped set the stage. But a lot of this information was backed up in the key findings, which seems to be a summary.
...But it *(referring to the personas)* definitely helped the, kind of, cultural background, you know, where the languages, and how important that was, and a lot of the information about . . . you know, kind of revealed how new mobile, internet, computers, the whole thing, are just, kind of new to this culture. Or at least it created the impression that it's extremely, you know, just a couple years old.

- *What was the most difficult thing about the task?* He felt that the most difficult thing "was just getting started." Marco added that:

Marco I think that's, kind of, the process though. You don't know how big you should start. I was trying to figure out, should it be split into Business and Social?

7.2.3.6c: Design description. Marco created six sheets of notes and sketches 8 $\frac{1}{2}$ x 11 inch unlined paper see Figure 64. Both his notes and the description of his design reflect a narrative of his thinking. (Because he verbalized his design thinking I also referenced the narrative from his design session to help understand his design).

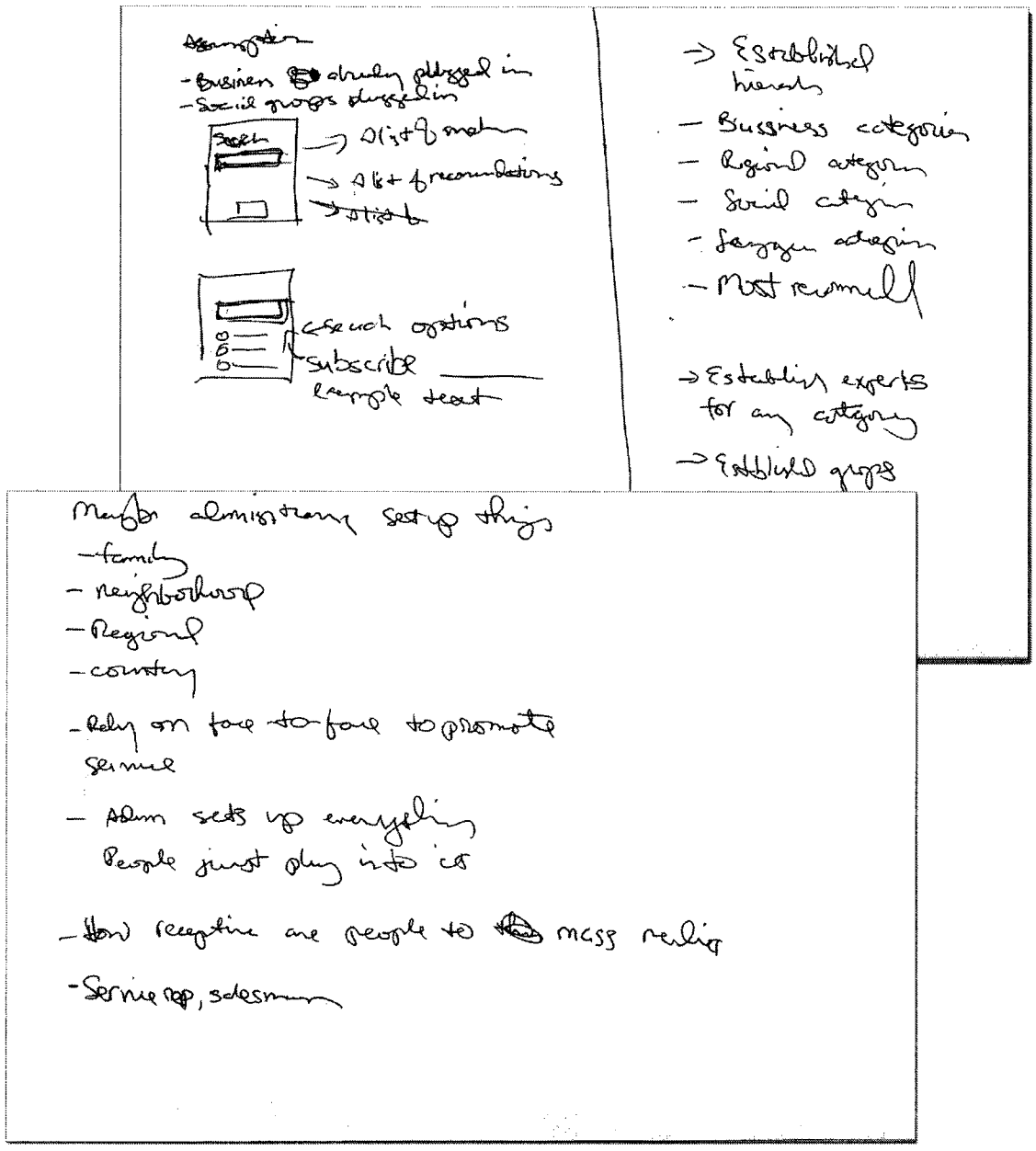


Figure 64: Marco's sample artifacts

Initially, Marco thought to separate users into social and business groups and then later decided that all users would enter into the system through a search.

Marco: Instead of having a Social and Business split, maybe it's just Search. I can try something different where it's just Search. Under Search, we'd have Create; if you found something or a person that you wanted to rate, and Subscribe as an option of whatever results you get.

Later he describes the idea of the search in more detail:

Marco: Yeah. And then, I started thinking about the search stuff. In particular: so what kinds of information. Oh, this was kind of a side thing about the browsing.
...You know, maybe we're not selling a phonebook or, as a service, we're selling this idea of you just go here and, you know, kind of, browse, subscribe to a group. Yeah. This is when I think I started the whole idea of subscribing, not just to, like, a bulletin board, but to groups. And those are the things that you actually attract with.

In his sketches, Marco provided several screen depictions of the search progression. All of the search progressions relied on web-based interaction that included forms and buttons which are not possible in a text-based interaction.

7.3.2.6d: Analysis of the design session.

- *Object and domain familiarity*. Marco behaved as though he was designing an unfamiliar object in a familiar domain as expected.
    - *What was his working model?* While he started out designing a two component system (business and social), he moved to a unified system where he grouped all functionality under search. The concept was still in a very early stage of development.
    - *Was there a formation of a working model complex enough to support global simulation? Was global simulation performed?* Yes, he tested out his search concept by depicting several sequential screens; however the design remained highly abstracted and there were many details that were not thoroughly investigated.

  - *Did he represent constraints?* Yes, he created copious notes on what the system needed to include.
  - *Did he perform note-making?* Yes, as the sample artifacts indicate, he wrote notes to himself in the right column of the search screen sequence sheets.
  - *Was there evidence of systematic expansion?* I think so. It was hard to discern if the elements were abstracted to a similar level because it was still such an early concept.
- *Perception related variables.* There was no acknowledgement in Marco's notes or discussion that this design was for a distant audience. Additionally, there was no evidence of recognition of the other perception-related variables.
- *Dependent variables.* There was some support for the focus claim in that under his unified search idea there were specific features created for business and social users; however, he never referred to how the groups differed in their needs during the discussion. As such, the claim of communication was not coded. There was no evidence to support any of the other dependent variables.
- *Who were the mock users? How were they defined?* Marco defined the users by roles defined as business and social users. His segments aligned to the segments presented in the Parxat and Shirin personas and context scenarios.

7.3.2.7: Maria (Experience level 7 of 10: medium group)

Maria was 36-40 years of age and identified her job title as an information architect. She self identified as a problem-driven strategist. Her HCD orientation alignment score was zero (very low) and her empathy scores close to the mean. Specifically, her scores were slightly below the mean for perspective taking and empathetic concern and slightly above for fantasy and personal distress. She claimed to have experience using personas in three projects over the last ten years. She spent approximately twelve and a half minutes looking over the personas and context scenarios in the preamble. She was the only participant to call the persona documents

by that label in the preamble. Maria engaged deeply with the personas and context scenarios focusing on the distant audience aspect in which she felt the documents needed more context as part of their presentation. She also expressed surprise that the documents were based on real data.

7.3.2.7a: Design session. At the beginning of the design session, Maria focused much of her time on the task definition sheet, making notes. She also spent a concentrated time reading over the Kyrgyz fact sheet (about three minutes). As the session continued, she spent more and more time on working towards a solution (writing/sketching or thinking in silence) and less time interacting with any of the other research materials, see Figure 65.

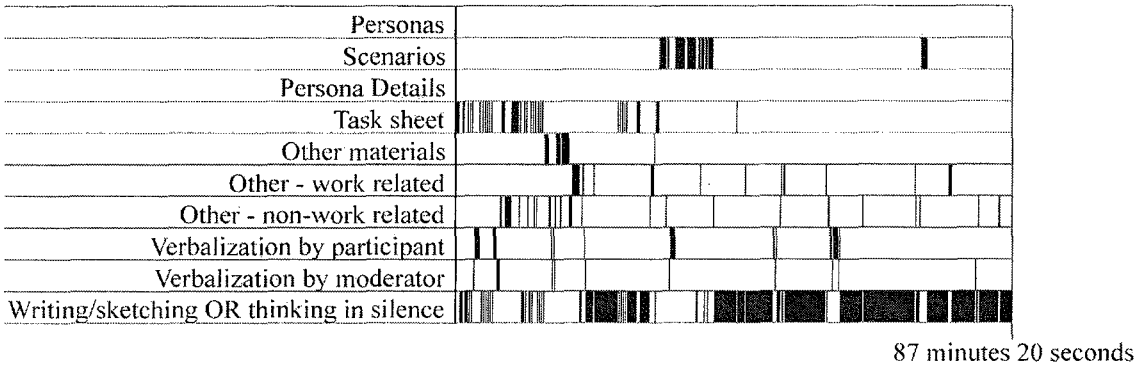


Figure 65: Maria's task timeline

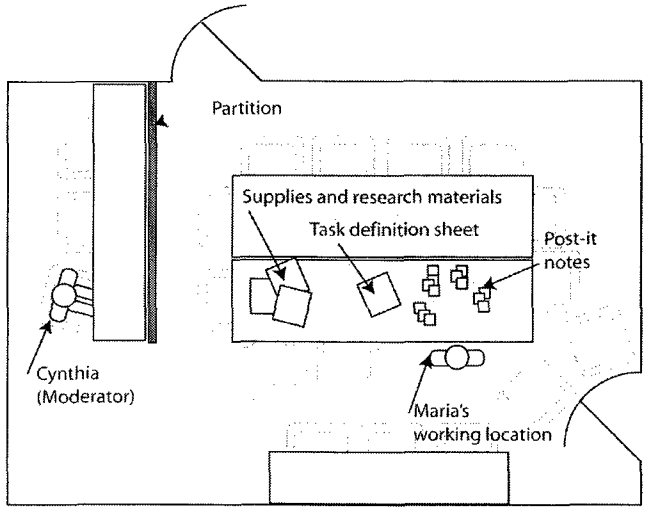
Maria made several comments throughout the session directed towards me in which she introduced caveats about her solution. In one exchange, she expressed concern about her lack of domain and audience knowledge and that this changed how she approached the solution:

Maria Well, this task is more challenging than I'm usually...than a task I've usually dealt with, because it's so new.
...I've never designed for Mobile. And, also it's for a demographic I'm not too familiar with, since I usually work on projects geared towards Americans or Western Europeans. So, what I'm doing is something I don't usually do, because this is so different, which is just like visualizing it through pictures.

Later, during the design session, she expressed concern that she will not get to a point in the solution that she had hoped and how that was affecting her approach:

Maria	I don't think I'll have time to actually finish the UI, but usually I like to do the use cases to make sure I understand . . .
Cynthia	Like we said, we're just watching how you do it, not, you know, not the quality of the solution. You get to a point where you're, like, you know, this is all I can do in this amount of time. That's fine.
Maria	Yeah. And, oftentimes, like in an actual business situation, I would first get, like, a sign-off on these use cases before doing any wireframes. And then at that point I would do wireframes.

As the session progressed, Maria displayed a preference for working with post-it notes. She stood throughout most of the task adjacent to the chair she sat in for the interview portions of the study. This was so that she could access and re-arrange her post-it notes; consequently most of the research materials were not in her immediate work space. She only moved the task definition sheet within view of her post-it notes, see Figure 66. This working arrangement appeared to minimize the amount of time that she interacted with the research materials later in the session.



(Not to scale)

Figure 66: Maria's working location

Maria spent a majority of her time (62%) working through the solution in silence. About 40% into the session she went back to the context scenarios and read them carefully, before resuming her work with the post-it notes. Among the research materials, Maria spent the most time reading the task definition sheet (9%) followed by the scenarios (9%). She did not spend any time reading the personas or the persona detail sheets see Figure 67.

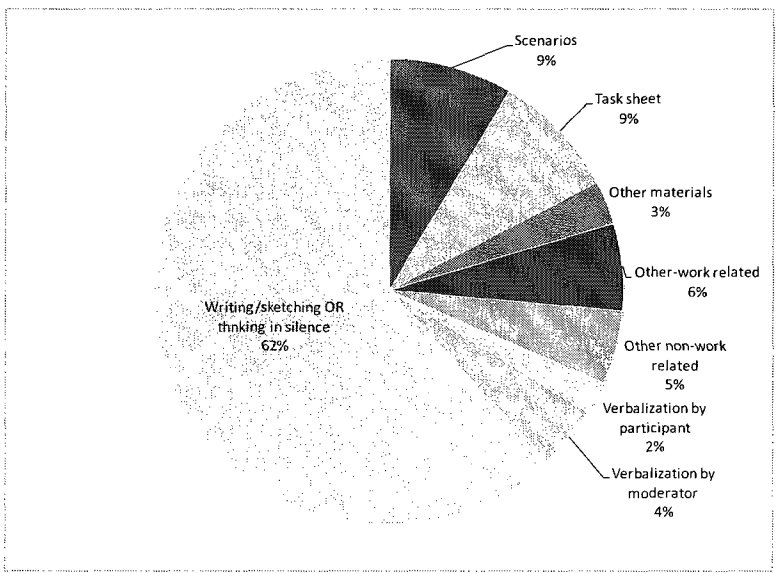


Figure 67: Maria task time distribution

7.3.2.7b: Debrief. Maria rated her solution as an eight. When asked what she would have done differently if she had more time, she focused on the technology and the audience.

Maria I don't really do text messaging, to find out more about this culture, and to understand this directory system. I don't think it's something we use. Does it exist in this culture? I don't know. But, if it does then I should know how to use it before designing for this experience.

- *What was helpful?* When asked about the research materials, she found the scenarios (in which she spent 9% of her time) helpful to her solution.

Maria I thought this was really helpful; the interaction statements.

> ...I mean, initially, I looked at this really quickly. Normally, it would be, like, a group activity, so initially I thought MoSoSo was a public directory. But looking at this carefully, it's a shared directory. And then I realized that shared directories require passwords.
> ...So, getting a lot of hints through these interaction statements helped. And how they would go about using it.

- *What was the most difficult thing about the task?* When asked about what she found to be the most difficult thing about the task, she focused on unfamiliarity with the object and audience but also elaborated that this was not the first time in which she has been asked to design an unfamiliar object.

Cynthia Okay. So, what that the most difficult thing?

Maria It's unique because it's a different culture, and I don't really understand how to really...I don't do text messaging.
...But I've designed for platforms that I've never used, or I wasn't that familiar with, like the interactive television, or a store application.

7.3.2.7c: Design description. Maria created 12 pages of notes $8\frac{1}{2}$ x 11 inch unlined paper and about 20 post-it notes representing her proposed interaction flow, see Figure 68 for a sample of her work. She started by taking notes using the personas and scenarios and then moved to the post-it note method to create different user flows, which she labeled 'use cases'. In this exchange she describes how the use cases were separated into separate paths for business and users:

Maria So, just bring it down . . . I mean, do we throw away some of these Post-its, or rearrange them, but put them in an order that makes sense? I have two groups: Business and Users. And then from there, I've created, like, use cases.
...For Business it's just a single use case for them to create . . . for them to put their business info in these public directories, or have it available so that people can put it in their shared directories.

But for the users, I mean . . . For now, I have ten use cases. But for me, if I really, like, spent more time on it, maybe there would be 5, or maybe 15.

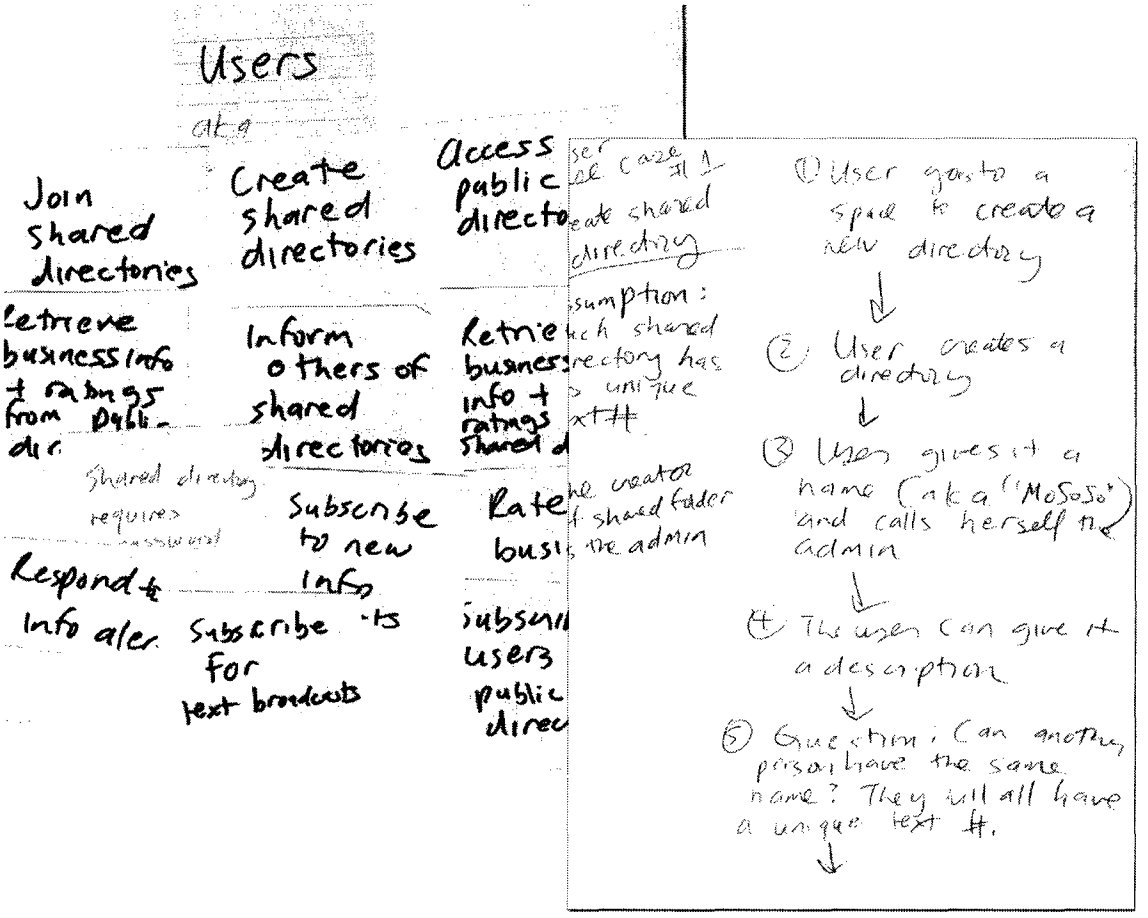


Figure 68: Maria's sample artifacts

Maria focused on listing out all the possible use cases in preparation for outlining the text interaction. Her method included first identifying a use case, for example, "creating shared directories," and creating post-it note with the use case as a header. Under this header, she arranged sequenced post-it notes that included "user goes to space to create new directory," "user creates a directory," and "user gives it a name and calls herself admin, user gives the directory a description." Associated the sequences were a series of assumptions and question, for example, with the use case above she wrote, "Can another person have the same name?"

7.3.2.7d: Analysis of the design session.

- *Object and domain familiarity.* The object was unfamiliar but the domain appeared to be familiar for Maria.
    - *What was her working model?* Early in the session, she went through a series of user drill downs represented by text and arrows (see the top sheet of the sample artifacts) which became a model composed of components under the two major headings of users and business.
    - *Was there a formation of a working model complex enough to support global simulation? Was global simulation performed?* Yes, she tested several user requirements and how they were linked through the sequenced post-it notes.
    - *Did she represent constraints?* Yes, she created notes about assumptions and requirements early in the design session on the unlined paper.
    - *Did she perform note-making?* Yes, as the sample artifacts indicate, she wrote reminder notes to herself.
    - *Was there evidence of systematic expansion?* Yes, however, the elements remained at a high level of abstraction.
- *Perception related variables.* While Maria was very vocal in the preamble about distant audience concerns there were no notes or indications in her design description in which she acknowledged design differences due to the unfamiliar audience. She did however verbally recognize the distant audience as she worked through her solution. There was no evidence of recognition of any other perception-related independent variables.
- *Dependent variables.* There was some evidence to support the claim of focus in that Maria exhibited an understanding of differentiated needs for a typical user and a business user. Additionally, there was mild support for the

communication claim because she discussed the two user groups by roles that aligned to the personas. There was no strong evidence to support any of the other dependent variables.

- *Who were the mock users? How were they defined?* Maria separated the users by roles defined as 'business' and 'users'. The segments aligned to the Parxat and Shirin personas.

7.3.2.8: Heather (Experience level 8 of 10: high group)

Heather was the oldest of all the participants reporting her age as over 55 years. She identified her job title as a designer; however, unlike other participants with the designer job title, she began her career as a print designer and had to re-skill for electronic mediums. Heather self identified as a problem-driven strategist and her HCD orientation alignment score was two (about at the mean). Her empathy scores were slightly below the mean for perspective taking, well below the mean for fantasy and empathetic concern and slightly above the mean for personal distress. While she claimed to have experience using scenarios in five projects over the last ten years, her definition of scenarios was not identified as aligning to the operational definition of context scenarios. She spent approximately ten minutes looking over the personas and context scenarios in the preamble and appeared to be actively engaged with the materials. All of her comments and questions about the personas and scenarios were concerned with the unfamiliarity of the audience.

7.3.2.8a: Design Session. Heather went right to work on her solution, as the timeline demonstrates. She rarely looked at the personas and context scenarios, and only for periods of time lasting less than a minute, see Figure 69. (Recall that the design session was shortened to 75 minutes because we had a late start to the study due to traffic problems). Like Leanne, she pulled out her phone as a reference (see other-work related category) about one quarter of the way through the session.

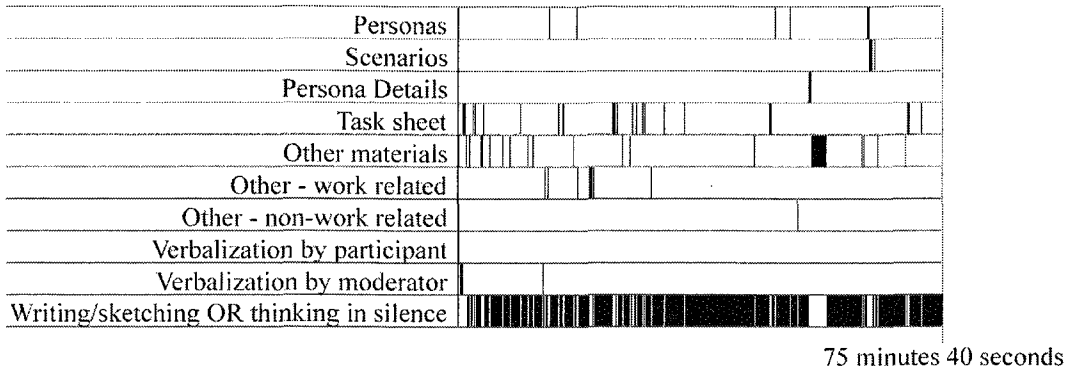


Figure 69: Heather's task timeline

Heather spent a large majority of her time (81%) making notes, sketching or thinking in silence; this was the largest percentage of time spent directly working towards a solution among the participants. Correspondingly, she spent a relatively small percentage of the time (3%) looking at the personas, scenarios and persona detail sheets. She did manage to look through the entire set of research materials, spending a couple minutes reading over the Kyrgyz fact sheet about 60% of the way through the allotted task time. See Figure 70 for Heather's task time distribution.

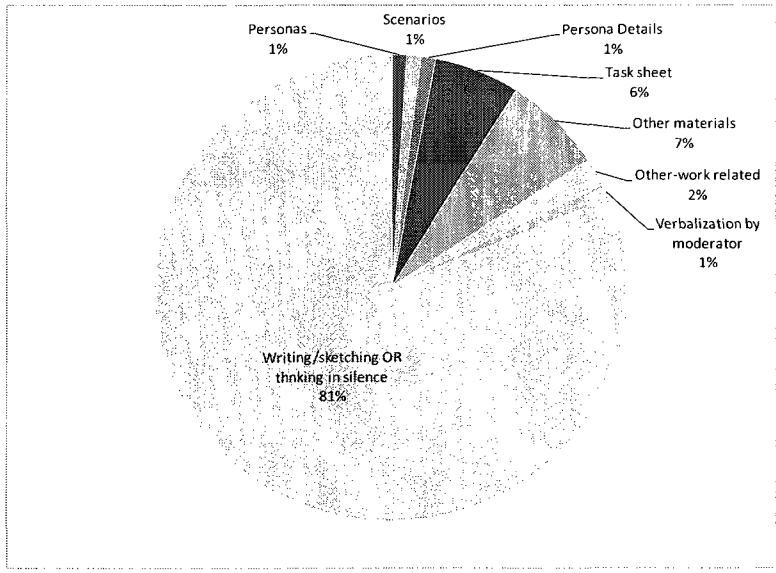


Figure 70: Heather's task time distribution

7.3.2.8b: Debrief. Heather rated her solution as between a six and a seven. When asked what she would have done differently, she said that she would have used a computer and felt that working the solution out on paper was difficult.

- *What was helpful?* Heather indicated that the personas (in which she spent 1% of her time with) were not helpful during the design stating that, "*I don't think I gained anything new...I just scanned them really fast.*" She found the Kyrgyz fact sheet very helpful in providing background information expressing amazement at how literate the population was. This appeared to counter a stereotype that she had previously held about rural populations.

Heather	I thought it was really sort of important to understand the background. And what amazed me was the level of literacy.
Cynthia	Yeah. That is pretty amazing, isn't it?
Heather	Yeah. It is. It is. Given that it's so rural. It's so isolated. An incredibly literate population.

  She declared that the scenarios were "*great*" using the word scenario to describe them and claimed to have used the documents "*a lot to sort of run through the scenarios.*"

- *What was the most difficult thing about the task?* She indicated that the most difficult thing had to do with designing for a small screen.

Heather	Thinking through what would have to be on a screen, much as you would on a computer screen, except it's small.

7.3.2.8c: Design description. Heather created five pages of notes on $8\frac{1}{2}$ x 11 inch lined paper and taped together flow charts describing two user interactions; one for business and one for social, see Figure 71.

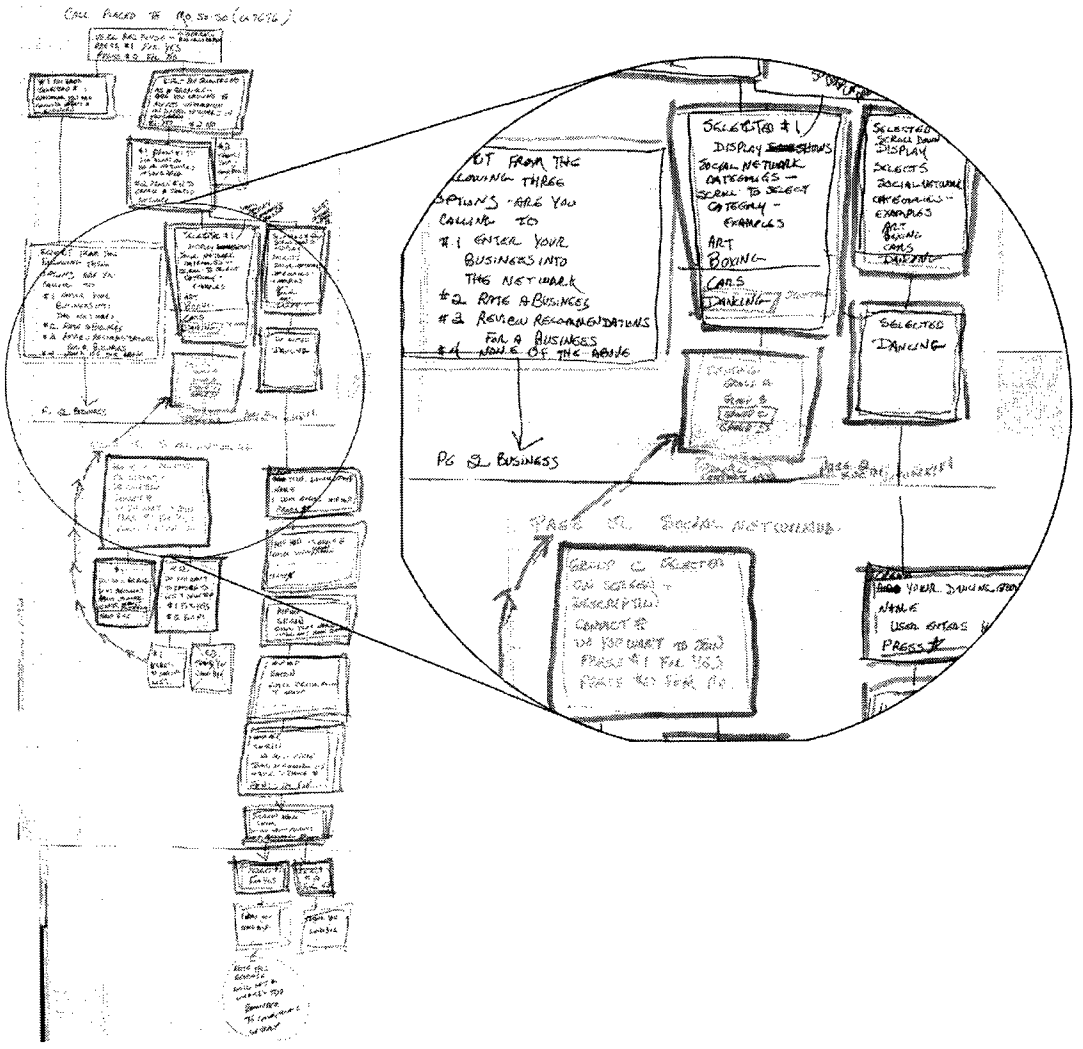


Figure 71: Heather sample artifact

In her description, she appeared to not understand some restrictions imposed by a text-based interface because she introduced colors and implied that the system would behave like a phone tree.

Heather	So, I said the number was 667676. That number 2, you selected No or you selected Social. That's probably better to say. Are you calling to access information on social networks in your area? "Yes." And then we go all the way down this path with two options, "No. Thank

you. Goodbye." So, every Thank you, Goodbye is sort of purple and x'd out.
...So, if you selected "1," then you go to see a list of the social networks in your area.
...And "Press number 2 to create a social network in your area." So, then we've got two paths running here. This one going all the way down to create. This one to see them.
...Okay. So, number 1 is "Display social network categories," because I figured we'd have to group them in categories.
...So, I just did the examples of art, boxing, cars, dancing.
...So, then this person selected dancing. Then these would all have names.

In this exchange she describes the social interface depicted in the artifact:

Heather Is your call business-related? "Press 1 for Yes," which would take you down the business path. "Press 2 for No," which would take you to the social. You could have done, "is your call business-related, social-related, Press 1 or 2." Probably that would have been a better choice right there. And, since MoSoSo the single number, I'm assuming it's serving both.

7.3.2.8d: Analysis of the design session.

- *Object and domain familiarity.* Based on Heather's design, the object was unfamiliar to Heather and the domain was familiar.
    - *What was her working model?* Her user model was of a two component system comprised of a social and a business set of interactions.
    - *Was there a formation of a working model complex enough to support global simulation?* Yes, she formed a global model through her flow charts.
    - *Was global simulation performed?* Yes, she tested several pathways through her flow charts.

- *Did she represent constraints?* Yes, she lists constraints from the user requirements within the flow charts.
- *Did she perform note-making?* Yes, as the sample artifacts indicate, she wrote reminder notes to herself.
- *Was there evidence of systematic expansion?* Yes, however, because of the reduced session time I had to stop her from completing the business component to the same level as the social component.

- *Perception related variables.* There is no indication in her design or her discussion that Heather had recognized the perception-related distant audience variable. She also did not discuss any of the other perception-related variables.
- *Dependent variables.* There was support for the focus claim in that Heather designed specifically for the needs of the users that were presented. There was also support for the communication claim. Although Heather did not discuss it in her design explanation, she used Shirin's persona name in her sketches of the social interface. There was no support for the empathy claim; however, stereotype avoidance was supported by her surprise about literacy rates among the population. She had assumed that a population that was largely rural would not have been so literate (Type III). There was also mild support for the criticism of stereotype confirmation. When Heather outlined an interaction path for dancing she was making an assumption about what Shirn liked to do; dancing was not mentioned in any of the personas or scenarios.
- *Who were the mock users? How were they defined?* Heather separated users by employing a mix of roles and names. She identified a 'business' user and Shirin; the business user aligned to the Parxat persona.

7.3.2.9: Hannah (Experience level 9 of 10: high group)

Hannah was 41-45 years of age and had identified her job title as an interaction designer. She self identified as a problem-driven strategist and her HCD orientation alignment score was four (the highest score possible). Hannah's empathy scores were

below the mean for perspective taking and empathetic concern. She had the lowest score among the participants in empathetic concern. She scored above the mean in both fantasy and personal distress. She had experience using personas and scenarios in one project in the last ten years. She spent approximately five minutes and 30 seconds looking over the personas and context scenarios in the preamble and appeared to prefer the scenarios identifying them as 'system specs.'

7.3.2.9a: Design session. Almost all of her engagement with the personas and context scenarios took place in the first half of the session, see Figure 72. When she did interact with any of the research materials, she would focus on the artifact and take notes. She had a working style very similar to Maria (the information architect), in that she started by making notes and then moved to using post-it notes about 40% into the session; however, she did not move to the other side of the table to arrange her notes. As such, the research materials remained in her workspace.

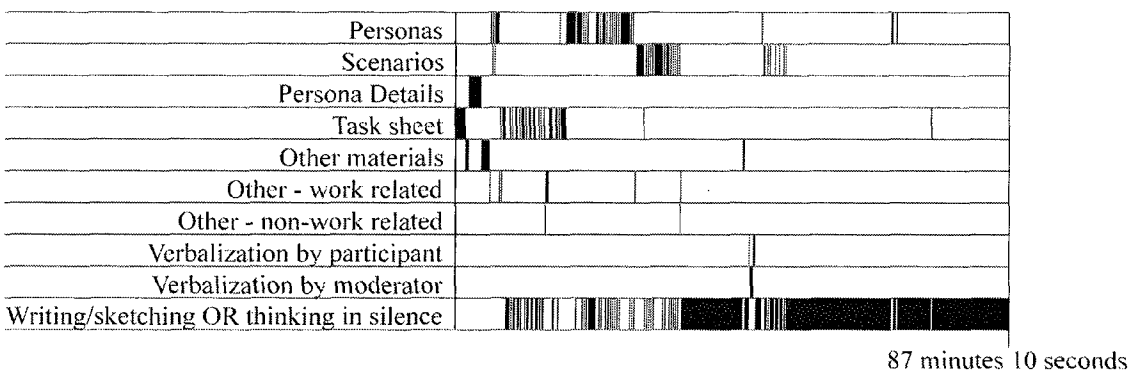


Figure 72: Hannah's task timeline

Hannah spent 19% of her time interacting with the personas and scenarios. Like all participants in the high experience group, she spent a majority of her time (67%) writing, sketching and thinking in silence, see Figure 73.

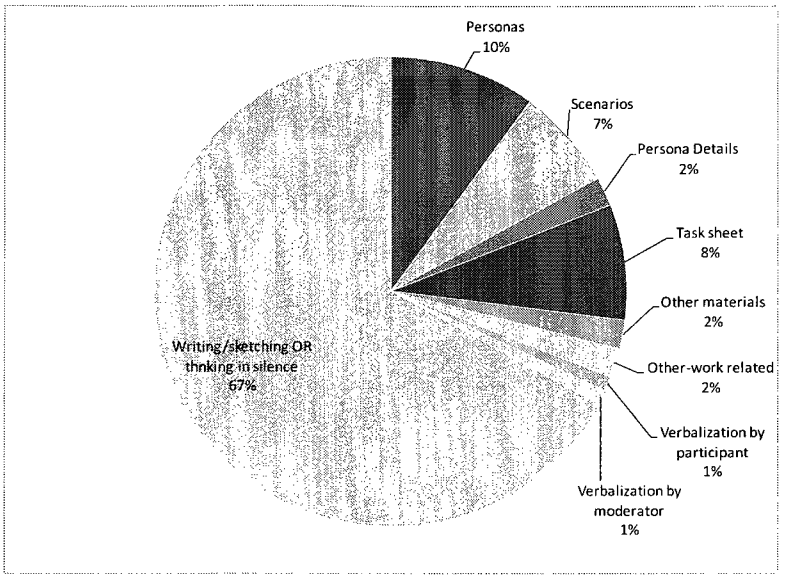


Figure 73: Hannah's task time distribution

7.3.2.9b: Debrief. Hannah rated her solution as a four because she felt it was '*pretty incomplete*'. This was the lowest score any of the participants gave their solution. When asked what she would have done differently, she said that she would have: (a) completely flowcharted the interaction; (b) worked directly with the team of programmers who would be developing the system; and (c) worked directly with end users. Luke also brought up end users; however, his interpretation was to talk to people he knew. Recall that Luke and Hannah had the highest possible HCD orientation alignment scores of four. I asked follow up questions about how she would interact with end users in this exchange in which she discusses building a paper prototype for usability (although she does not use that language in her description):

Hannah	I'd be working with other, you know, I think I'd work with my technical team first and then work it through end users, too.
Cynthia	Okay. And how would you work it through users?
Hannah	With end users? Yeah. I would actually make, like, paper...What do they call those? It's kind of like a paper walk-through on the screen. So, you know, you...I'd kind of, like, flowcharted part of the ...they actually chart it, like, you know, if you're here

you're going to select between one or two. What would you select? Okay. If you select one, then this is what you would see. Now what would you do? I would see if they could follow it.
...And if they got to where they wanted to go. And if they got there without frustration and how much frustration to get there.

Cynthia And about how many people, end users, do you think you'd want to look at to do that with?

Hannah I think probably about . . . At least maybe... I think at least one from each of those groups there, because ...A minimum, three; and one from each group, ideally, at least.
...I don't know. Maybe two to three from each group.

- *What was helpful?* Hannah indicated that she started by focusing on the task definition sheet and that it gave her a "*broad view, overall view.*" She said the personas (she looked at them for 10% of her time) were helpful because they gave her a realistic understanding of the users and the scenarios (she looked at them for 7% of her time) were her "*check.*"
- *What was the most difficult thing about the task?* Hannah found the complexity of the project and the lack of time to solve the problem the most difficult thing.

Hannah It started getting pretty complicated having to figure out, you know, how the non-text piece works together.

7.3.2.9c: Design description. Hannah created two pages of notes on $8\frac{1}{2}$ x 11 inch tracing paper and 22 post-it notes to describe her design. Her approach was to write each of the user requirements from the task definition sheet and write that on a post-it. She then flow charted an interaction under the user requirements. These interactions were based directly from the context scenario stories, see Figure 74 for her sample artifacts.

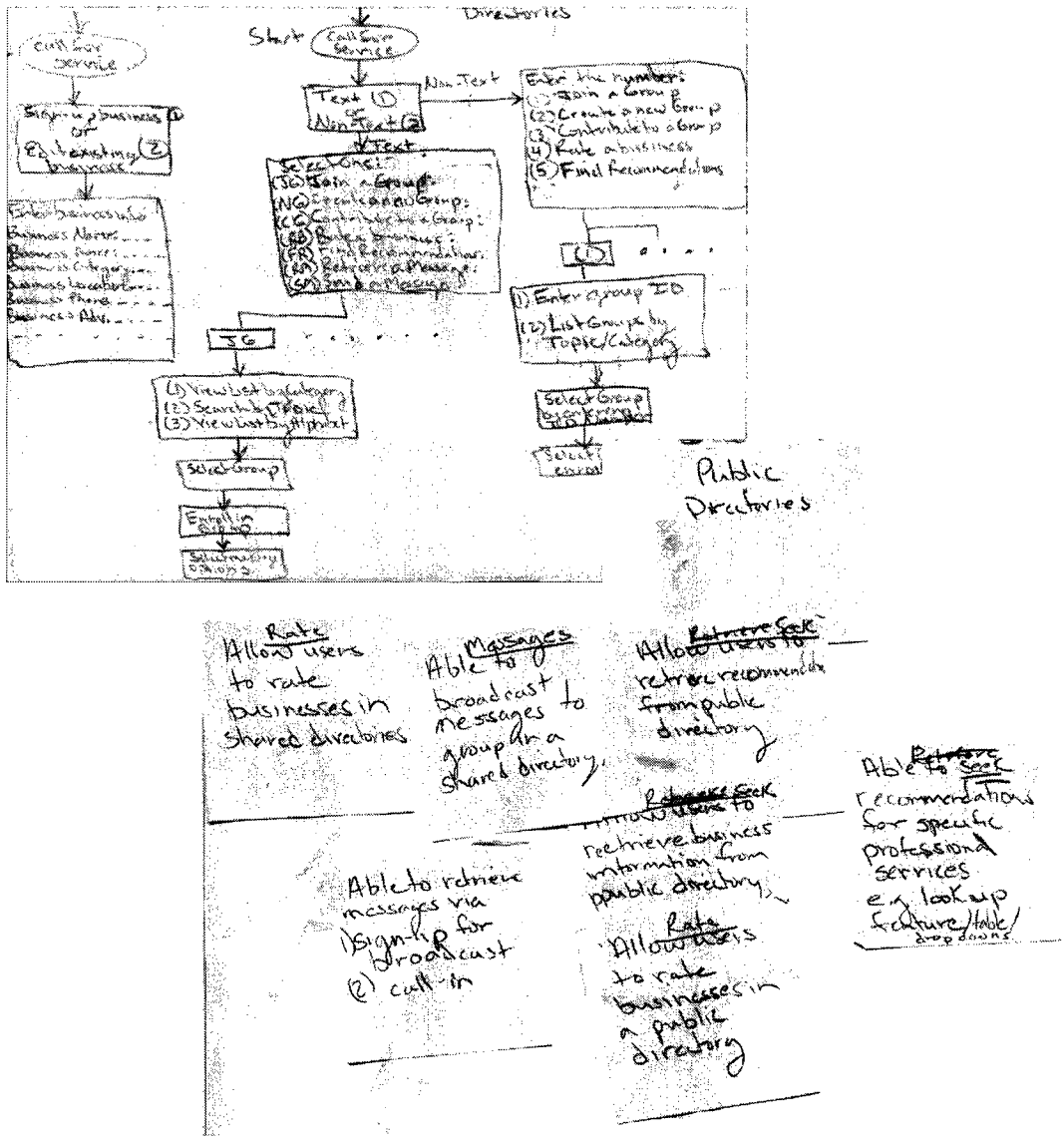


Figure 74: Hannah's sample artifacts

This is how Hannah described the business interaction which is taken directly from the Parxat scenario:

Hannah .... for the business owner, you know... he started with, getting a flyer and calling in public service and then finding out he had to use text to do it. So, you know, as a business owner you're going to have two options. Like, if he's signing up for the business, or editing an existing one.

> ...And then it's all text-based it said here, so, you know, there's a text line that's going to ask him to enter specific information and they're going to have to go through each of the steps to enter the information via text to get themselves registered or signed up into this advertisement service.

7.3.2.9d: Analysis of the design session.

- *Object and domain familiarity.* Hannah's behavior was typical of an unfamiliar object in a familiar domain which was expected.
    - *What was her working model?* Her user model was of a two component system comprised of public directories and private directories.
    - *Was there a formation of a working model complex enough to support global simulation? Was global simulation performed?* Yes, she formed global simulation in both her notes and post-it flow charts.
    - *Did she represent constraints?* Yes, she listed most of the constraints early in the session on the tracing paper sheets.
    - *Did she perform note-making?* Yes, most of her note-making was on the tracing paper sheets.
    - *Was there evidence of systematic expansion?* Yes, both the private and public directories were about at the same level of abstraction.
- *Perception related variables.* There was no acknowledgement in Hannah's notes or discussion pertaining to any perception-related variables, including the audience distance.
- *Dependent variables.* The focus claim was supported by Hannah's understanding the needs of the users that were presented. Additionally, during her explanation she referred to the users by roles that aligned to the personas thereby supporting the communication claim. There is no evidence to support any other dependent variables.

- *Who were the mock users? How were they defined?* Hannah separated users by roles as 'business owner' and 'services consumer'. The services consumer could access both the private and public directory components. The business owner aligned to the Parxat persona and the services consumer aligned to the Shirin and Roza personas.

7.3.2.10: Howard (Experience level 10 of 10: high group)

Howard was 36-40 years of age and identified his job title as a developer. He self identified as a problem-driven strategist and his HCD orientation alignment score was four (the highest score possible). His empathy scores were clustered around the means, scoring above the mean in fantasy and personal distress and below the mean in perspective taking and empathetic concern. Howard had no previous experience using personas and scenarios. He spent approximately ten minutes and 30 seconds looking over the personas and context scenarios in the preamble focusing most of his time on the scenarios. However, he expressed concern that the scenarios were not detailed enough to really guide him through the design.

7.3.2.10a: Design session. Howard had a consistent working pattern in which he read over one of the context scenarios, made notes and then put the context scenario down to work through a solution. As the timeline demonstrates, there were three distinct sections in which he focused on the context scenarios. Each of these sections represents a focus on a particular context scenario, beginning with Parxat's and ending with Roza's, see Figure 75.

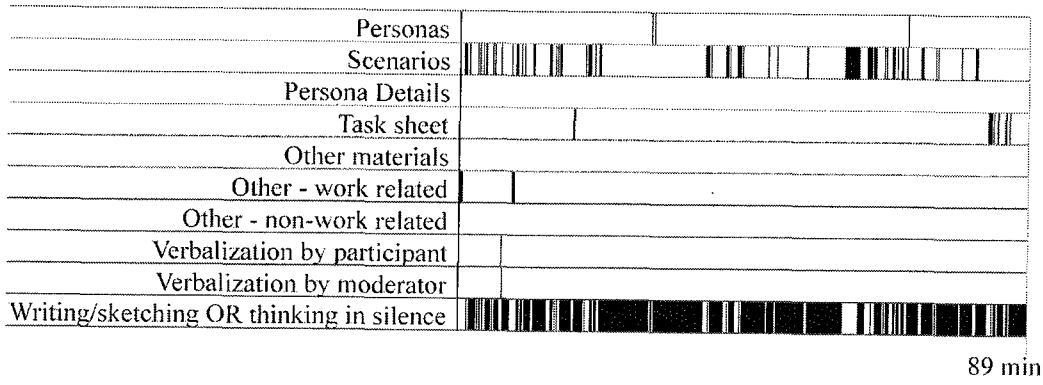


Figure 75: Howard's task timeline

Howard spent most of the task time working, sketching or thinking in silence (i.e. solution-focused). As evident in the timeline, he spent a large amount of time interacting with the scenarios (17%), but only looked at the personas for 1% of the task time, see Figure 76.

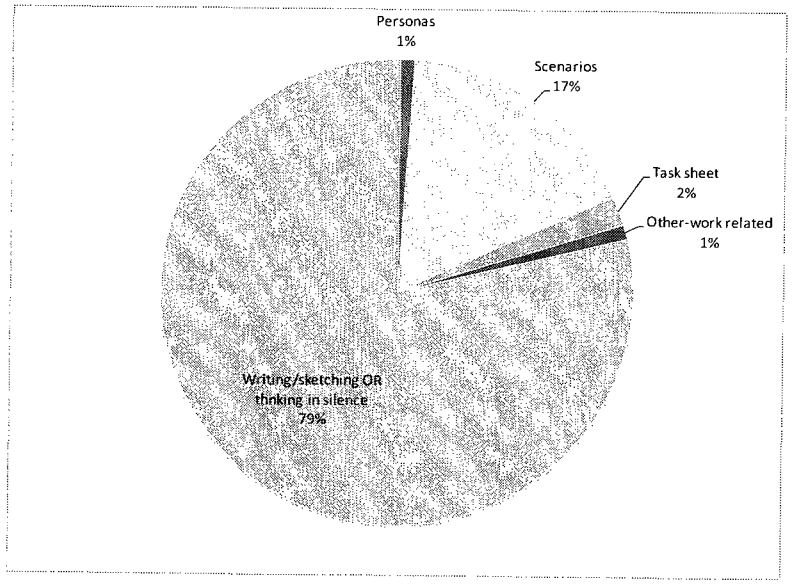


Figure 76: Howard's task time distribution

7.3.2.10b: Debrief. Howard rated his solution as an eight, declaring that it was a complicated problem. He was the only participant to openly declare that he enjoyed trying to work through the problem stating that it was '*fun to do this kind of stuff.*" If he

had more time he would have used a large whiteboard or the computer instead, "*something that is more flexible than a piece of paper.*"

- *What was helpful?* Howard felt that all the materials were useful to some degree. Picking up the personas (which he spent 1% of the task time reading) he claimed, for example, "*...from this I saw that more than one language is spoken.*" Picking up the context scenarios (which he spent 17% of his time with) he said that the documents "*defined everything for me.*" He continued to talk about how he used the context scenario in more detail:

  Howard What I did is, 55% of the people represented this guy, 32% for this, 13% for this. So, I started with this guy. I walked through these two interactions. Actually, I went through all of them first. None of them seemed to contradict each other.
  ...So, I walked through this one first. And, also, just gleaning it there was . . . each of these represents not just three specific users, but three very different ways of interacting with it.
  ...This one is the most interesting, *(holding the Parxat scenario)* though, because he's interacting with it in two different ways.

- *What was the most difficult thing about the task?* Howard felt that the most difficult thing about the task was '*representing it.*' He went on to add:

  Howard Something that I usually do is write pseudo code and lay it out easily that way. And that's what I'll often do. But immediately these were...this was a lot of decisions, so I knew I had to lay it out in more of a map and so there's a lot of erasing

7.3.2.10c: Design description. Howard created three sheets of flowcharts on 11 x 17 inch unlined paper. He used a sophisticated pattern language in which the user screens were drawn out in rectangles and the system logic was represented in diamonds. The rectangles and diamonds were connected by arrows to represent the user/system flow, see Figure 77.

In Howard's interaction concept, the user would remain within the telephone tree system until a text interaction was required; the user was expected to first determine by using a phone tree if they were (1) interacting within a public or private directory system and (2) whether they were a business or an individual user. In his model, both businesses and individuals could form private directories. Once the determination was made, the user was sent an appropriate text message to start the text interaction.

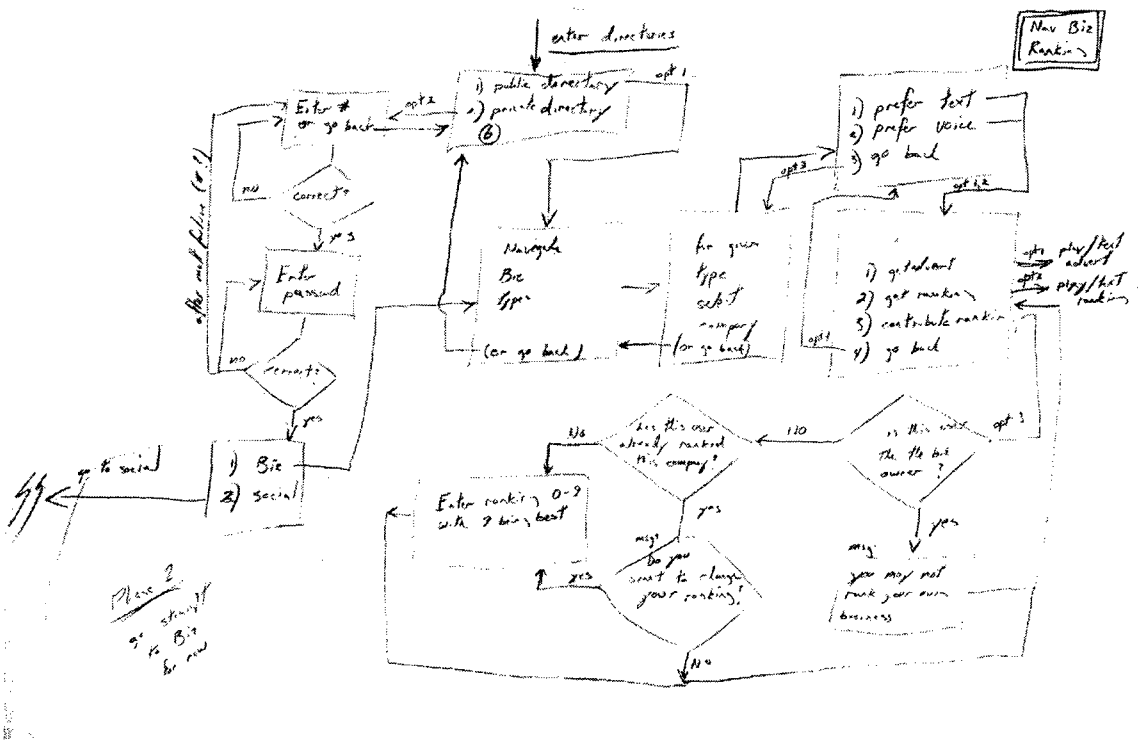


Figure 77: Howard sample artifact

7.3.2.10d: Analysis of the design session.

- *Object and domain familiarity*. Howard's behavior suggested that the system was an unfamiliar object in a familiar domain as expected.
    - *What was his working model?* His user model had four components: (1) business/public directory; (2) business/private directory; (3) user/public directory; and (4) user/private directory.

- *Was there a formation of a working model complex enough to support global simulation? Was global simulation performed?* Yes, he performed global simulation through his flow charts which followed a pattern language.
- *Did he represent constraints?* Yes, throughout his artifact he lists several needs that the system must have.
- *Did he perform note-making?* Yes, he makes several notes of things to keep in mind in his artifacts.
- *Was there evidence of systematic expansion?* Yes, the components appear to be detailed at similar levels. Additionally, his solution was much more detailed than any of the other participants.

- *Perception related variables.* The acknowledgement of the distant audience in Howard's design was that the end user would have to select a language for interaction. There was no recognition of the other perception-related independent variables in his design or design description.
- *Dependent variables.* The focus claim was clearly supported in that Howard was specifically designing for the users presented in the personas and for the interaction described in the scenarios. There was some evidence of the communication claim: while there was no indication of the personas in his artifacts, he referred to the users by name in his discussion about his design. Claims of empathy and stereotype avoidance were not supported. There was no evidence to support the criticism/concerns.
- *Who were the mock users? How were they defined?* Howard separated the users by roles as business and social users. The business user aligned to the Parxat persona and the social user aligned to the Shirin persona.

7.3.3: Task summaries

In the next sections, I summarize the findings for the design session (section 7.3.3.1), the debrief portions (section 7.3.3.2) and design discussion (section 7.3.3.3) portions of the study.

7.3.3.1: Design session summary

There were three notable trends among the three designs by task experience groups. First, as the experience level increased, the groups averaged more solution-focused time (working, sketching or thinking in silence). This finding corresponded with the approximate time it took participants to start focusing on making notes or sketching. The lower experience groups spent much of the early parts of the task sessions reading over the research materials, averaging 16 minutes to start focusing on making notes and sketching. Conversely, the high experience group only averaged five minutes of time before focusing on making notes and sketching. In other words, it appeared as though experience was positively associated with the ability to get straight to work on a solution, see Table 20.

Table 20: Observed differences: solution-focused time

	Working/Sketching Or Thinking in silence	Approximate time to start making notes/sketching
Leanne	40%	15 minutes
Lucy	64%	15 minutes
Lewis	77%	3 minutes
Luke	54%	30 minutes
Mean for group	**58%**	**16 minutes**
Malcolm	78%	0 minutes
Marco	66%**	5 minutes
Maria	62%	15 minutes
Mean for group	**69%**	**7 minutes**
Heather	81%	2 minutes
Hannah	67%	10 minutes
Howard	79%	2 minutes
Mean for group	**76%**	**5 minutes**

** Time combined with verbalizations directed towards me because of the working style of the participant

Second, the type of research document that the groups spent time focusing on was different and followed distinct patterns, see Table 21. The low experience group focused the most on the personas, the least on the context scenarios and the most on the persona detail sheets when compared to the other two groups. The low experience group also spent the most time (on average) studying the task definition sheet. Conversely, the high experience group spent more time on the scenarios than any other group, but less on the personas and persona details than the low experience group. They spent the least amount of time studying the task definition sheet. No participants in the medium experience group ever looked at the personas or persona detail sheets. This could have been partially due to the fact that both the verbal participants (Malcolm and Marco) were in this group and I felt that the verbalizations may have interfered with how the participants might usually behave when engaged in a design problem.

Table 21: Observed differences: research material time percentages

	Personas	Scenarios	Persona Details	Task Definition sheet	Total time for All research materials
Leanne	12%	0%	8%	24%	48%
Lucy	2%	6%	4%	18%	35%
Lewis	4%	6%	8%	2%	23%
Luke	18%	0%	1%	19%	19%
Mean for group	**10%**	**3%**	**5%**	**15%**	**15%**
Malcolm	0%	9%	0%	0%	0%
Marco	0%	1%	0%	20%	20%
Maria	0%	9%	0%	9%	9%
Mean for group	**0%**	**6%**	**0%**	**10%**	**10%**
Heather	1%	1%	1%	6%	6%
Hannah	10%	7%	2%	8%	8%
Howard	1%	17%	0%	2%	2%
Mean for group	**4%**	**8%**	**1%**	**5%**	**5%**

Third, the percentage of time spent with all the research material was inversely related to time on task and was unexpected. The low experience group, who all: (a) self-identified as having a solution-driven strategy; and (b) had spent less time on average reviewing the materials in the preamble (as expected) ended up spending *more* proportional time (on average) with the research materials, i.e. materials from the problem space, in the design task session (which was unexpected). I discuss possible hypotheses for this finding in the discussion section.

7.3.3.2: Debrief summary

There were no clear patterns of difference among the groups. However, there were some patterns among all the participants, see Table 22 and Table 23 for summarizations.

Participants who claimed that they would have developed a more detailed solution if they had more time tended to rate their solutions lower ($N = 5$, $M = 6.4$) compared to other reasons ($N = 4$, $M = 7.6$), see Table 22. Other reasons included using a more flexible technology to develop the solution ($N = 2$), work with a larger design team ($N = 2$), and more research in the culture and the technology ($N = 1$).

Table 22: Post task summary one

	Average rating	What would you have done differently if you had more time?
Leanne	7.0	More detailed solution
Lucy	6.5	More detailed solution
Lewis	7.0	More detailed solution
Luke	8.0	Work with a larger team
Mean for group	**7.1**	
Malcolm	8.5	was a webite)
Marco	7.5	More detailed solution
Maria	8.0	technology
Mean for group	**8.0**	
Heather	6.5	Used a computer
Hannah	4.0	work with end users
Howard	8.0	Used a computer or whiteboard
Mean for group	**6.2**	

Three participants (Lewis, Maria, and Howard) claimed that the scenarios were the most helpful documents while they were designing; these participants were distributed among all three experience groups, see Table 23. Only two participants (Leanne and Lucy) claimed that the personas were the most helpful documents; these two participants were both from the low experience group.

Table 23: Post task summary two

	What was most helpful during the design?	What was the hardest thing?
Leanne	Personas	Knowledge related: Lack of domain (with text) experience
Lucy	Personas	Knowledge related: Lack of domain (with text) experience
Lewis	Scenarios	Task related: Organizing the system elements
Luke	Scenarios	Knowledge related: Lack of domain (with text) experience
Malcolm	N/A	Task related: Not having a larger team to work with
Marco	Task definition, but found the personas and scenarios good background	Task related: Getting started
Maria	Scenarios	Knowledge related:Unfamiliar audience, Lack of domain (with text) experience
Heather	Fact sheet	Task related: Thinking through the system represented on a small screen
Hannah	Task definition, personas and scenarios	Task related: complexity of the system and time constraint
Howard	Scenarios, but found everything helpful	Task related: Difficult to represent the elements

Four participants (Leanne, Lucy, Luke and Maria) expressed that the hardest thing about the task was that they had a lack of knowledge about the technology. Maria was the only participant to mention that unfamiliarity with the audience made the task more difficult. The remaining six participants focused on an aspect about the task when asked 'what was the hardest thing' about the task.

The two participants who wanted to bring in users to consult (Hannah and Luke – albeit people he knew for Luke) both had the highest possible HCD orientation alignment scores. This finding suggests that the desire to consult with users might be associated with a greater HCD awareness.

7.3.3.3: Design discussion summary

In the design review and the discussion about the designs, a few consistent patterns emerged. First, the length of the design session appears to be related to the familiarity of the domain. See Table 24 in for object and domain familiarity. The shaded lines represent the three participants who found the domain unfamiliar. In all three cases where the domain familiarity was questioned due to a lack of global simulation and note-making the participants had shortened sessions. Additionally, by multiplying the amount of time spent in 'solution-focused time' these three participants spent the least amount of total time on the solution (Leanne spent about 19 minutes, Luke spent about 34 minutes and Malcolm spent about 31 minutes).

Table 24: Object and domain familiarity

	Object familiar	Domain familiar/ globally conceieved concept
Leanne	No	No
Lucy	No	Yes
Lewis	No	Yes
Luke	No	No
Malcolm	No	No
Marco	No	Yes
Maria	No	Yes
Heather	No	Yes
Hannah	No	Yes
Howard	No	Yes

Second, some claims were well supported while others were not. There was strong evidence in almost all of the sessions to support the focus claim[55], see Table 25. The communication claim was also strongly supported in that six of the ten participants used either the personas names (Luke, Malcolm and Heather) or user roles that aligned to the personas (Maria, Hannah, and Howard) in their discussion about their designs. Three participants (Luke, Malcolm and Heather (shown shaded in Table 25) also provided evidence that supported the stereotype confirmation criticism. Heather simultaneously provided evidence of stereotype avoidance when she expressed surprise at the high literacy rate (Type III) of the rural population. There was minimal support for the empathy claim in the participant discussion of their solutions. Both Malcolm and Lucy exhibited empathy in their design discussion.

Table 25: Summary support for dependent variables

	Support for claims					Criticism
	Recognition of distant audience	Focus	Empathy	Communica-tion	Avoid ill-informed assumptions / stereotypes	Stereotype confirmation
Leanne	Yes	Yes				
Lucy	Yes	Yes	Yes			
Lewis	Yes					
Luke		Yes		Yes		Yes
Malcolm	Yes	Yes	Yes	Yes		Yes
Marco		Yes				
Maria	Yes	Yes		Yes		
Heather		Yes		Yes	Type III	Yes
Hannah		Yes		Yes		
Howard	Yes	Yes		Yes		

Finally, the perception-related distant audience variables appear to be salient to many Designers in that six of the ten participants provided evidence that supported this

[55] Recall, focus was coded if participants addressed the needs of the users that were presented in the research materials; both the identification of user needs and the segmentation differences among the three personas.

assertion. No other perception-related independent variables, all of which have to do with research (sample size, methods, background of research team and presentation) were mentioned by any of the participants during the task[56].

7.4: Discussion preamble and task portion of the study

The first primary research question driving this investigation asked if personas and (context) scenarios were perceived as usable, useful and effective translations/conduits of user research by Designers. In the case of this exploratory design study, this question required looking at the outcomes of persona and context scenario use. Were the personas/context scenarios used to create effective mock users? And did they meet the positive claims made of them in the literature and avoid concerns and criticisms? The findings from the study regarding these two questions are discussed in section 7.4.1.

The second primary question of this investigation asked what should UX researchers strive to understand about Designers to maximize the effectiveness of personas and context scenarios? Answering this question requires an understanding of how designer-related moderator variables explored in the design study were interrelated to each other and to the outcomes of persona/scenario use. Answering this question also requires an understanding of which of the perception-related variables matter to designers. This was ascertained by exploring whether perception-related variables were mentioned by participants as being salient concerns. The findings from the study regarding these two questions are discussed in section 7.4.2. This is followed by an overall summary of the study findings in section 7.4.3.

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[56] However; recall that presentation was mentioned by three participants (Leanne, Lucy and Maria) in the preamble.

7.4.1: Were the personas and context scenarios usable, useful and effective?

There were three areas in which I determined if the personas and context scenarios were effective, usable and useful. I asked the following questions: (1) Was there a mock user(s) defined? (2) Were the beneficial claims evident? (3) Were the criticisms and concerns evident? The next sections discuss how mock users were defined (section 7.4.1.1), followed by a discussion about the claims and criticisms that appeared to have been met (section 7.4.1.2).

7.4.1.1: How mock users were defined?

All ten participants created mock users; however, Lewis's mock users did not align to the users presented in the personas and context scenarios. As such, this was coded as a failing of the focus claim. Six participants further abstracted their mock users into roles which included a business user who aligned to the Parxat persona, see Table 26.

Table 26: How mock users were defined

	Who were the mock users? How were they defined?	Were the mock users aligned to the personas?
Leanne	Business and user: Role	Yes
Lucy	Business, private, and public: Role segments	Yes
Lewis	User, private, and personal: Role segments	No
Luke	Parxat, Shirin and Roza: persona names	Yes
Malcolm	Parxat, Shirin and Roza: persona names	Yes
Marco	Business and social: Role segments	Yes
Maria	Business and users: Role segments	Yes
Heather	Business and Shirin: persona names and roles	Yes
Hannah	Business owner and services consumer	Yes
Howard	Business and social: Role segments	Yes

The mock users that participants identified were:

- Two participants (Marco and Howard) identified a business and social user. The social user aligned to the Shirin persona. I assumed that the Roza persona was not included because her access to the system was part of the Phase 2 requirements listed on the task definition sheet.
- Three participants (Maria, Leanne and Hannah) designed their systems for a business user and a generalized user who combined the Shirin and Roza personas, (Hannah called the latter user a '*services consumer*').
- Lucy designed her system for a business user and for private and public directory users.
- Three participants (Luke, Malcolm, and Heather) used the persona names to define their mock users. In the case of Malcolm and Luke, they used all three personas while Heather had an abstracted business user and Shirin.

In sum, these findings indicated that personas and context scenarios used in the design study provided effective summarizations of the UX research in so far as they helped participants create mock users.

7.4.1.2: Did the personas and context scenarios meet positive claims and avoid concerns and criticisms?

The focus claim[57] was well supported in the design study especially in the task portion of the study, see Table 27. Only Lewis's session was not coded for focus because the mock users he identified (user, public directory, private directory) did not align to the personas. I hypothesized that there are two possible variables that might have contributed to this result.

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[57] For the claim of focus I identified evidence in comments or notes that were directed at separating the needs of the users by the persona groups presented in the research materials. In other words, I attempted to ascertain if the participant displayed an understanding of audience needs as defined by the three personas and their context scenarios; both what the needs were and how they are different or differentiated by user segments.

Table 27: Preamble and task evidence for beneficial claims

	Preamble				Task			
	Focus	Empathy	Communica-tion	Avoid ill-informed assumptions / stereotypes	Focus	Empathy	Communica-tion	Avoid ill-informed assumptions / stereotypes
Leanne					Yes			
Lucy	Yes		Yes		Yes	Yes		
Lewis				Type II				
Luke					Yes		Yes	
Malcolm		Yes	Yes		Yes	Yes	Yes	
Marco	Yes				Yes			
Maria	Yes		Yes		Yes		Yes	
Heather		Yes		Type I	Yes		Yes	Type III
Hannah	Yes				Yes		Yes	
Howard	Yes				Yes		Yes	
Total	**5**	**2**	**3**	**2**	**9**	**2**	**6**	**1**

First, Lewis spent a truncated amount of time in the preamble reviewing the documents. While he spent more than the average amount of proportional time with the personas, persona details and context scenarios during the design task portion of the study, the preamble time was the only time when participants were asked to focus on the documents. It is possible that without really reading the research in depth before moving to solution, Lewis never engaged with the materials at a level that formed an aligned set of mock users. This suggests that asking Designers to focus on UX research prior to starting their solution might be especially beneficial for mock user alignment to research.

Second, Lewis was the only participant to identify his cognition strategy as knowledge-driven, which was the sub variant (and more extreme version) of solution driven. Recall that the statement that he felt most described him was, "I rely primarily on my prior knowledge to develop a solution and less on external sources (by external sources we mean a source other than yourself)." This statement accurately reflects his actions, indicating that extreme solution-driven designers may have fewer proclivities to use personas and context scenarios to create mock users that are aligned to the research.

Combined, these results suggest that UX researchers might benefit by providing Designers a focused time to spend and discuss personas and context scenarios before

starting to work on solutions. Additionally, Designers who identify themselves as knowledge-driven might need to be encouraged to spend this focused time because it appears to run counter to their cognition style.

The communication claim[58] was also well supported. Eight of the ten participants exhibited behaviors in which they used the personas or the roles presented in the personas as part of their discussion in either the preamble or the design task. Persona advocates argue that the communication claim facilitates consensus and efficiency in team decision making (Mulder & Yaar, 2007). Since this was a solo project, however, I was not measuring if meeting the communication claim actually does lead to better decision making.

There were two participants (Leanne and Lewis) who did not discuss users as defined by the personas in either the preamble or the task. These participants had three things in common: (1) they both shortened their design task time and did not take the full 90 minutes allotted; (2) they both claimed that they would have provided a more detailed solution if they had more time; and (3) they both spent *more* proportional amount of design time reviewing the research materials, including the personas, personas details and context scenarios during the task portion of the study. Since both truncated the design session it is possible that they just were not engaged by the design problem; therefore, were less engaged by the UX research materials. Additionally, by indicating that they would have detailed out the solution more if given more time, they were acknowledging that they did not feel their solution was very well conceived. This did not appear, however, to encourage them to spend more time trying to improve their solution. The fact that they spent more proportional amount of time reviewing the research materials indicates that this result was not associated with simple time spent

[58] The communication claim was affirmed if the participants referenced the personas by name in *discussion* or in questions. Communication was also coded if participants discussed the users by roles that aligned to the personas. It was difficult at times to separate focus from communication; in fact, I discovered that there were no clear cases of communication without focus. Theoretically, a case of communication without focus would involve a participant using persona names in conversation but not demonstrating any understanding about how the personas were differentiated.

with the research; instead, it appears to be associated with how engaged the participants were by the task problem.

The empathy claim[59] was only minimally supported by participant discussion. Malcolm provided evidence of empathy in both the preamble and the task, while Lucy appeared to confirm empathy in her discussion about her solution. These two participants share the top two scores in the empathetic concern dimension of empathy. Malcolm scored way above the mean at 24 points ($M = 16.4$) and Lucy had a score of 18. (Note that Leanne also had a score of 18 but did not provide evidence for the empathy claim). This suggests that the proclivity to feel concern for someone in a difficult situation is possibly positively associated with empathetically engaging with personas and context scenarios at an emotional level.

There was minimal evidence during the task or debrief parts of the design study to support the claim that personas help Designers avoid ill-informed assumptions/stereotypes. Lucy (who indicated surprise about users playing paintball, type II) and Heather (type I) both expressed surprise about some of the things they learned about the Kyrgyz people in the preamble. Additionally, Heather expressed surprise (type III) about how literate the mostly rural population was in Kyrgyzstan. The lack of evidence to support this claim during the task could be explained by the audience distance; i.e., lack of knowledge led to relatively few previously held assumptions about the audience. (Participant's previous knowledge about the region was largely confined to geographic understanding). The question of how personas help Designers avoid ill-informed assumptions was investigated in more depth later in the interview portion of the study, see Chapter 10.

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[59] Comments in which the participant clearly put him/herself in the user's situation (perspective taking) were coded for the empathy claim. Other empathetic behavior included involvement or questions about the lives of the personas (fantasy), felt compassion or was concerned about the conditions of the persona's situation (empathetic concern), or expressed dismay about the persona's situation(s) as communicated by the scenarios (personal distress).

Heather was the only participant to simultaneously display evidence for (a) avoidance of ill-informed assumptions through surprise about the Kyrgyzstan audience and (b) a willingness to assign behaviors to the personas characters (i.e. dance lessons for Shirin) that were not presented as part of the UX research. This finding indicated that expressing surprise about the audience did not obviate stereotype confirmation.

Marco was coded for stereotype confirmation in the preamble because he referred to a negative past persona experience in which he was witness to this criticism, see Table 28

The three participants (Luke, Malcolm and Heather) who provided evidence which supported stereotype confirmation during the task had all created their own ideas for what the personas would do with the system. This suggested that the participants were using the personas as empty vessels in which they filled with their own assumptions. These three participants had three things in common: (1) none had previous experience using personas; (2) all used the persona names (versus roles) as part of their mock user constructs; and (3) they had three of the lowest scores in the fantasy dimension of empathy.

Table 28: Stereotype confirmation

	Stereotype confirmation criticism	
	Preamble	Task
Leanne		
Lucy		
Lewis		
Luke	Yes	Yes
Malcolm		Yes
Marco	Yes	
Maria		
Heather		Yes
Hannah		
Howard		

The suggested relationship to persona experience and stereotype confirmation indicates that this criticism is supported when Designers are new to using personas. In other words, that inexperience leads those who are new to personas to further the

character fiction with their own embellishments. The association with the use of the persona names versus roles when discussing mock users suggests that these participants were not abstracting the users. Abstraction of personas into roles may help avoid the unwanted outcome of stereotype confirmation.

Furthermore, the low fantasy scores among these participants indicated that lacking the ability to engage with fictional characters may increase the risk of this unwanted outcome of persona and context scenario use. This finding suggests that the ability to engage with fictional characters might be related to the capacity to readily accept new evidence counter to an existing assumption or stereotype.

Lastly, the apparent relationship between stereotype confirmation and inexperience with the persona method also provides support for another criticism of persona use. Other researchers have found that novice Designers who were new to personas either did not incorporate them into their work (Blomquist & Arvola, 2002) or that the personas "functioned as an internal concept in the discussions between interaction designers and to justify design rationales 'after the fact' to other project members," (Rönkkö, 2005). These researchers suggest that Designers need training to understand how to use personas and this exploratory design study appears to support and further this conjecture. Interestingly, I found evidence to support the beneficial claims of persona and context scenario use by participants with whom I also observed stereotype confirmation. In other words, a single designer can use personas and context scenarios to create mock users aligned to the research and benefit from claims of use while simultaneously supporting these two criticisms.

7.4.2: Mock Designers

What should UX researchers strive to understand about Designers regarding the effectiveness of personas and context scenarios? Answering this question requires an understanding of the following: (1) designer-related moderator variables explored in the study were interrelated to (a) each other and (b) to the outcomes of

persona/scenario use presented in section 7.4.2.1[60]; and (2) what perception-related variables were mentioned by participants as being salient concerns. In other words, what mattered to the participants? The later part of the question is discussed in section 7.4.2.2.

7.4.2.1: Designer related independent variables

Professional experience, age and self-identified cognition strategy (which are all highly correlated) were associated with object expertise. All of these designer-related variables are in turn associated with several outcomes from the study: (a) the amount of time spent on the task and in solution-focused time; (b) the amount of time spent in the preamble and task on the UX research materials; (c) how long it took to begin focusing on the solution; and (d) which types of documents were found to be most useful. Additionally, HCD orientation alignment appears to be related to how the participants described what they would do differently if given more time. Each of these associations are detailed in the next sections (7.4.2.1a – c) starting with the interrelationships among designer-related independent variables and object expertise.

7.4.2.1a: Object expertise. It was assumed that all participants would have some level of domain familiarity and I discovered post-task (findings in Chapter 6) that none of the participants had object familiarity. However, in the study it appeared as though three participants also did not have familiarity with the domain.

In all three cases where the domain familiarity was questioned due to a lack of global simulation and note-making, the participants (Leanne, Luke and Malcolm) had shortened sessions. Additionally, these three participants spent the least amount of total time on the solution: Leanne spent about 19 minutes; Luke spent about 34 minutes; and Malcolm spent about 31 minutes (compared, for example, to Howard who spent about 71 minutes). This suggests that these participants may have truncated their session because they were unable to create a design that supported global simulation.

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[60] Some interrelationships among designer-related independent variables and outcomes were also discussed in the previous section.

Unlike Malcolm, Leanne and Luke shared many similarities. Leanne and Luke both: (a) had less than five years of professional experience suggesting that domain inexperience is confounded with professional inexperience; (b) identified themselves as solution-driven; (c) expressed dislike for the scenario documents and subsequently did not spend any time reading them; (d) spent a greater than average time reading the persona documents during the task; and (e) took a greater than average time to start working on the solution during the task. Conversely, Malcolm claimed to have over ten years experience, identified himself as problem-driven, found the scenarios more helpful, spent no time on the personas and began the task immediately. This incongruous finding suggests that while domain inexperience was probably confounded with professional inexperience, domain and professional experience are not exactly the same.

It makes logical sense that domain expertise would be directly linked to professional experience. In other words, more experience in a field would naturally lead to more expertise in the domain of that field. Therefore, in the case of Leanne and Luke, domain inexperience was probably confounded with professional inexperience. However, Lewis and Lucy, who also had less than five years of professional experience, demonstrated domain familiarity. In other words, a minimal amount of professional experience did not equate to domain unfamiliarity; however, domain unfamiliarity was more likely among inexperienced designers.

Malcolm, on the other hand, had reportedly over ten years of professional experience, but this did not appear to lead to domain experience. To understand this incongruous finding, I focused on how Malcolm behaved differently from the other experienced professionals during the task and debriefing. The most obvious difference was the amount of time he spent analyzing the timeline and the budget documents, spending about 15 minutes total time in the preamble and task on the documents compared to about 10-30 seconds for other participants. Malcolm, therefore, demonstrated much more comfort with timeline and budgets than with the other

documents. This indicated that he may have had more experience in managing projects than with actually designing/developing technology, and thus, was inexperienced in the domain. In sum, the level of domain expertise appeared to be associated with professional experience, but this did not always correlate.

7.4.2.1b: Designer-related variables and outcomes from the study. There were four task outcomes associated with the designer-related moderator variables of professional experience, age, domain expertise and problem-driven cognition strategy. First, the variables were all positively associated to time spent on the task and the proportional amount of time spent solution-focused. In other words, older participants with more experience and domain expertise and who had identified a problem-driven strategy spend more time on task. Second, the variables were positively associated to the time spent reading and reviewing the personas and scenarios in the preamble but negatively associated with time spent with the documents during the task. Third, the variables were negatively associated with the length of time participants took to begin writing or sketching, i.e., focus on their solution. Fourth, the variables were positively associated with focusing more on the scenarios (and subsequently finding them more helpful) and negatively associated with focusing on the personas and persona details. See Table 29 for a summary. Additionally, the two participants with the highest design by task experience scores (Hannah and Howard) expressed a strong preference for the context scenarios; these two participants only scanned the personas.

Table 29: Summary of task behaviors by professional experience

	Less professional experience (less than five years), younger, solution-focused, domain unfamiliarity	More professional experience (five years or over), older, problem-focused, domain familiarity
Time spent on task	Less	More
Preamble time reading the personas and scenarios	Less	More
Task time reading the personas and scenarios	More	Less
Times to start writing and sketching (focus on solution)	More	Less
Focus on personas and persona details	More	Less
Focus on scenarios	Less	More

Given the strong association between self-identified cognition strategy and professional experience with longer time spent reading the personas and context scenarios in the preamble was expected behavior (problem-driven/experienced designers are expected to spend more time in the problem space). However, it was not predicted that this group would spend less time reviewing the research during the task portion of the study. I had two possible hypothesis for this finding: (1) perhaps it took the sharpened focus of a design problem to encourage the less experienced Designers to interact with the research material, so in essence, they were 'making-up' for the shorter spent preamble time; or (2) the less experienced designers presumably had fewer design models in which to pull from memory and thereby struggled more with finding a starting point for their design. Therefore, they focused on anything but trying to solve the problem. The latter hypothesis is supported by the longer time the less experienced group took to start making notes or sketching.

7.4.2.1c: HCD orientation alignment. HCD orientation alignment scores were not associated with any task behaviors; however, they were associated with one outcome of the design debrief. When participants were asked what they would have done differently given more time, only two participants, Hannah and Luke, mentioned

working with end users. Hannah and Luke had HCD orientation alignment scores of four which was the highest possible score. Hannah described a paper prototyping process to interact with end users and Luke suggested talking to people he knew who used social networking. This association intuitively makes sense because the HCD orientation alignment score was calculated primarily by the participant's identification of the Gould and Lewis three principles which concern involving users. While this finding did not have relationship to how the personas and context scenarios were used, it does suggest that Designers with higher HCD orientation alignment are more attuned to the idea of including users in their work.

7.4.2.2: Designer/ perception-related independent variables

The perception-related distant audience variable was salient to six of the ten participants. When combined with the findings from the preamble, only Hannah and Luke never: (a) mentioned or focused on language differences; and (b) never presented questions that focused on possible differences between designing for the Kyrgyz audience versus a local audience. As discussed above, these two participants had the highest possible HCD orientation alignment score and they were the only participants to express a desire to bring in end users to help with the design.

Table 30: Perception-related variables coded in preamble and task

	Preamble			Task		
	Distant audience	Research methods	Presentation	Distant audience	Research methods	Presentation
Leanne			Yes	Yes		
Lucy	Yes			Yes		
Lewis				Yes		
Luke			Yes			
Malcolm	Yes			Yes		
Marco	Yes					
Maria	Yes	Yes	Yes	Yes		
Heather	Yes					
Hannah						
Howard				Yes		

With such a small sample, it is very difficult to assess why these were the only two participants to not bring up the distant audience in any way. My hypothesis is that the fact that they wanted to bring in users may have been an indication that they were ignoring the distant audience as a variable. In other words the differences between an audience in Kyrgyzstan and in Seattle were not highlighted in their minds. Luke supported this hypothesis in his solution in which he suggests that Shirn searches for a restaurant in Seattle; in other words, the distance did not occur to him. In Hannah's case, as a highly experienced information architect, she may have simply felt it was irrelevant to the mechanics of the interaction design; as such, she ignored the distance.

Finally, the presentation was discussed (unsolicited) in the preamble by three participants (Leanne, Luke and Maria). Leanne and Luke did not like the textual nature of the scenarios; both of these participants were in the lower experience group. Maria suggested that because they describe a distant audience more context was needed as part of the presentation. This finding suggests that presentation is an important perception-related variable. Additionally, if the research is targeted for less experienced Designers a highly textual presentation is not recommended, and some Designers will find context-related presentations important when the audience is distant.

7.4.3: Summary: exploratory design study

The study provided some informative findings regarding the research questions driving this investigation, in which I asked: (1) are personas and (context) scenarios perceived as usable, useful and effective translations/conduits of user research by Designers; and (2) what should UX researchers strive to understand about Designers to maximize the effectiveness of personas and context scenarios?

First, the findings in the study suggested that personas and context scenarios are effective in most cases in helping Designers create mock users who are aligned to UX research; as such, I argue that the focus claim was supported. There was evidence that the participants understood the needs of the users represented by the personas and how their needs were differentiated. Additionally, the claim of communication was

supported in so far as the personas and context scenarios provided a means by which the participants could discuss the end users in most cases. However, there was minimal support for increased empathy and for ill-informed assumption/stereotype avoidance.

There was evidence to support the stereotype confirmation criticism from three of the ten participants (additionally Marco discussed co-workers displaying this behavior in the preamble); however, evidence of this criticism was not tantamount to finding the personas and context scenarios ineffective. The ability for personas and context scenarios to meet the all claims could concur with stereotype confirmation. Participants who exhibited evidence to support this stereotype confirmation had two attributes in common: (1) no experience with the persona method; and (2) low fantasy dimension empathy scores.[61] As such, these are part of the list of attributes that UX researchers should strive to understand about Designers discussed in the next section (section 7.4.3.1).

7.4.3.1: Designer attributes

Based on the findings from the design study, I began to compile a list of Designer attributes in which there was evidence of differentiation in Designer ability and proclivity to effectively use personas and context scenarios. In other words, what should UX researchers understand to create a mock Designer construct? Effective use of personas and context scenarios in the design study was identified by: (1) creation of mock users; (2) evidence of meeting the beneficial claims of use; and (3) evidence of avoiding the criticisms. Attributes are discussed in the next sections (7.4.3.1a – g).

7.4.3.1a: Professional experience. Recall that professional experience is positively associated with likelihood of exposure to UX research methods in general and scenarios specifically (this finding was from the screening survey). Professional experience is highly positively correlated with age. More experienced Designers also tend to focus more on context scenarios during design than on personas suggesting that

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[61] Additionally, all used the persona names (versus roles) as part of their mock user constructs, but this was not considered a Designer attribute.

including context scenarios with personas is an important consideration when creating personas for more experienced Designers. Less experienced Designers were more likely to find a textual presentation of scenarios difficult to engage. Therefore, understanding the level of professional experience of the Designer audience might affect what types of documents are created and the document's presentation modes. For example, more inexperienced Designers might engage more deeply with context scenarios if they were presented as visual storyboards.

7.4.3.1b: Design cognition strategy (self-identified). Self-identified cognition strategy also appears to be associated with professional experience. More experienced Designers were more likely to identify with a problem-driven strategy. A problem-driven strategy was also associated with a willingness to spend more time with the personas and scenarios initially. Conversely, participants who spent more time with the documents in the preamble started working on the solution (writing and sketching) much sooner in the design session. The one participant who did not create mock users aligned to the research (Lewis) identified himself as knowledge-driven (sub variant of solution-driven). This finding suggests that when summarizing UX research for self-identified solution-driven Designers, researchers should work hard to assure that there is emphasis on introducing the research documents and providing time for the Designer to become familiar with the research

7.4.3.1c: Object and domain expertise. Since the participants in the study all lacked object expertise, I was not able to investigate any possible association of personas and context scenario use and object expertise. However, three of the participants exhibited behavior that indicated they lacked domain expertise. Domain expertise appears to also be confounded with professional experience because it was more likely to be evident among the inexperience participants. Behaviorally, a lack of domain expertise was associated with a shortened design session for all participants but was not consistently associated with how the personas and context scenarios were used.

Since all participants had limited experience designing for this audience I was also not able to investigate whether an unfamiliar audience is tantamount to a novel domain.

7.4.3.1d: HCD orientation: Experience with the method. Inexperience using personas was associated with stereotype confirmation. One behavior in particular was associated with observing stereotype confirmation: participants used the persona names in their design documents versus abstracting the personas into roles. However, as discussed below, all three participants who provided evidence of stereotype confirmation also had low scores in the fantasy dimension of empathy in addition to inexperience with methods. This finding suggests that inexperience combined with low fantasy scores might be associated with how personas and context scenarios are used.

7.4.3.1e: HCD orientation alignment. Participants with a high HCD orientation alignment were more likely to express a desire to consult users as part of the design process. It also appears that this was associated with a reduced likelihood to consider differences that might occur with audience distance.

7.4.3.1f: Audience Distance. Presentation mode mattered to one participant (Maria) who focused on the unfamiliarity she had with the audience. Much like object unfamiliarity, the participants were homogenous in their lack of knowledge about the Kyrgyzstan audience. Therefore, associations between audience distance and how the personas and context scenarios were used was not possible to thoroughly investigate in the preamble and task portion of the study. (Later in the study more explicit questions were asked to explore the interaction between personas/context scenarios and audience distance; results are discussed in Chapter 10).

7.4.3.1g: Empathy dimensions. Two of the IRI empathy dimensions appeared to have associations with how the personas and context scenarios were used. As discussed above, the fantasy (FS) dimension appears to be related to stereotype confirmation. A high score in the empathetic concern (EC) dimension appears to be associated with evidence supporting the empathetic claim of personas.

7.5: Next steps

In this chapter I presented results from the first part of the exploratory design study in which I observed how personas and context scenarios were used prior, during and after a 90 minute design task. The results provided a preliminary list of Designer attributes intended to help UX researchers identify what they should know about their Designer audience. I added to this list in the next chapter in which I explored past personas and scenario experiences.

Chapter 8 Results: Past experiences with personas and scenarios

In this chapter, I discuss participants and respondents previous experiences with personas (and context scenarios). There were four sets of questions aimed at exploring experiences with personas and scenarios. First, participants and responders were asked to estimate the number of projects in which personas and scenarios had been used in their experience. Findings to this question were discussed in Chapter 6. The remaining three sets of questions are: (1) What are the first three things that come to mind in association with personas and/or scenarios (section 8.1)? (2) What was your last experience (section 8.2)? (3) What was your best and worst experience (section 8.3)? I summarize past experience findings in section 8.4 and then outline the next steps for the dissertation in section 8.5.

8.1: First three things that come to mind

For the first question pertaining to persona and survey experience, I asked in both the survey and design study participants for the "*First three things that come to mind with personas...and/or scenarios.*" The questions were asked separately for personas and scenarios. I used this question as a screening test to assure that design study participants and survey responders had concepts that aligned to how I was defining personas and context scenarios in Chapter 2.

It became obvious that the term persona had a high level of precision among UX professionals who had experience with the method. In other words, when the term persona was used among those who claimed to have experience with the method, there was a general consensus as to what the term meant. ***However, I encountered a problem with the data for the scenario term.***

The term 'scenario' is imprecise among UX professionals. As I noted in Chapter 2, the term scenario has many meanings. It became obvious that the survey

responders also held multiple meanings. I could not, therefore, be sure what meaning the survey responders had in mind.

My initial solution, to operationally define 'context scenarios' and code the 'three things' response accordingly[62], was not sufficient. As I continued to analyze past experiences, it became apparent that many Designer respondents (especially those with developer job titles) had a fluid concept of what scenarios were. In other words, many Designers job title respondents answered the 'first three things' in a way that fit my operational definition of context scenarios but then later discussed scenarios in terms which were not aligned to the context scenario concept (this was not true with the persona concept). Since this research is concerned with scenarios in so far as they augment the mock user image, I needed to be sure that it was the 'context scenario' concept respondents had in mind. Since I could not be sure, I made the decision to not include any survey responses that asked about scenarios exclusively.[63] The resulting persona informant sample was 16 Designer job title types from the survey, five participants from the study, and 16 UX Centric job title types.[64] The resulting context scenario informant sample was limited to only one study participant (Marco). He was the only participant who claimed to: (a) have scenario experience on the screening survey; and (b) recognize the context scenarios in the study as similar to scenarios that he had interacted with professionally. I was, therefore, confident that he had context scenarios in mind when answering questions about scenarios.

In the next two sections I describe the procedures I used to analyze responses (section 8.1.1), followed by the findings (section 8.1.2).

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[62] My operational definition included those answers which directly involved users in some way and helped Designers form a mock user construct. Specifically, I looked for answers describing scenarios as research summarizations that: (a) were stories about users interacting with a product or service; (b) provided context about the product or user situation; and (c) helped define and describe what different users might do with a product or system.

[63] Some survey questions were asked about personas and scenarios jointly; I retained those questions in my analysis.

[64] There was only one persona survey responder with a Management job title; therefore, I did not consider this job title group.

8.1.1: Data analysis procedures

Answers for 'the first three things that came to mind' about personas were coded for: (a) neutral definitions; (b) positive or negative definitions or statements; (c) definitions or statements that supported the claims or criticisms of personas; and (d) unsolicited mentions of perception-related independent variables (sample size, research, research methods, background of the research team, presentation of the document and audience distance).

8.1.2: Findings

In this section, I present findings pertaining to personas from both the design study participants who had claimed previous persona experience and survey responders (section 8.1.2.1).[65] Additionally, findings from Marco, the only design study participant with previous context scenario experience is discussed in section 8.2.2.2

8.1.2.1: Personas

Most of the statements (97%) from the study participants ($N = 5$) and the survey responders ($N = 32$) were categorized as one of the following[66]: (a) a definition of personas that was neutral ($N = 56$); (b) positive ($N = 15$) or negative statements ($N = 7$); (c) descriptions that provided evidence to support claims or criticisms ($N = 18$); and (d) statements that surface perception-related independent variables ($N = 10$). In the next sections, I first describe the answers from the five design study participants with past experience using personas and explain how their answers were specifically coded (section 8.1.2.1a). Second, I discuss the findings from the survey respondents who had Designer job titles (section 8.1.2.1b). Third, I present findings from responders with UX centric job titles (section 8.1.2.1c). Finally, I combine the study participant

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[65] All ten of the study participants were asked to describe the first three things that come to mind in association with personas; however, I am only presenting the findings from the study participants who claimed to have previous persona experience.

[66] The remaining five were coded as 'other'; total number of definitions or statements was 37x3 = 111.

findings with the Designer survey responders and contrast the findings from the Designer group to that of the UX centric job title group of responders (section 8.1.2.1d).

8.1.2.1a: Design study participants. Design study participants' answers are presented in Table 31. While both Marco and Hannah specifically mention the importance of context in their answers, this was not apparent in any of the follow-up survey responses.

Table 31: First three things about personas (study participant response)

	Number of projects	Answer	Coded as
Leanne	3	Average people.	Neutral
		Targeted people.	Supporting the focus claim
		Next-door neighbor	Neutral
Lucy	1	A specific type of person.	Supporting the focus claim
		Not one individual, but a person	Neutral
		Someone who's likely to react a certain way, or be influenced by certain things, or communicate in a particular way.	Neutral
Marco	8	A useful outline	Positive
		..understand not just a person, but also the situation that they're in; their environment	Neutral
		They're also good reference.	Positive
Maria	1	Demographics	Neutral
		Research	Supporting research-related perception variable
		Goals	Neutral
Hannah	1	Personalities	Neutral
		Information about end-user needs	Neutral
		the context of use is important.	Neutral

8.1.2.1b: Follow-up responders: Designers (N = 16). There were a total of 48 definitions and statements from the 16 (16x3) respondents with Designer job titles. Most statements (*N statements* = 27, 56%) were coded as neutral definitions. Among these definitions, three sub categories emerged:

(1) Whom they describe (*N statements* = 5) which included:

- "People," Respondent 009
- "Human face," Respondent 085
- "They are not real people," Respondent 079.

(2) What they should contain (*N statements* = 9), which included:

- "User demographics," Respondent 085
- "Experience level of user," Respondent 019
- "User needs," Respondent 040.

(3) What they describe (*N statements* = 6):

- "They describe the way that those users will use our software," Respondent 071
- "Usage pattern of subject in question," Respondent 085
- "Interactions that a persona is going to do," Respondent 178.

Five survey responders with Designer job titles included seven definitions that framed personas positively. Positive comments included:

- "Personas are a good way of summarizing a lot of user research," Respondent 094
- "Useful for proving UX goals to others who don't understand UX design," Respondent 070
- "A useful guiding tool for research (timesaver)," Respondent 050.

Two responders with Designer job titles used negative terms to define personas, Respondent 180 simply described personas as '*vague*' and Respondent 094's negative description supported the criticism that asserts that personas are not believable because they are not tied to data when he submitted that personas were:

- "Goofy...some people take more time making up irrelevant stories about the personal details that don't really apply."

Among the Designer job title responders, there was also strong evidence of the focus claim. Seven statements from five different responders alluded to how personas help hone in on specific subsets of users. These definitions included:

- "They describe the types of users of our software," Respondent 071
- "Role of user," Respondent 019
- "Specific target," Respondent 132.

The communication claim was supported by one Designer respondent who wrote that personas:

- "Help developers and the usability team get a consensus of who we're developing for," Respondent 094.

There was only one definition coded for a perception-related independent variable from the Designer group of responders. Respondent 077 submission of "posters" as one of the first three things that comes to mind emphasized the salience of presentation for this respondent.

8.1.2.1c: Follow-up responders: UX Centric (N = 16). There were a total of 48 definitions and statements from the 16 (16x3) respondents with UX Centric job titles. Like Designers, most statements (40%) were categorized as neutral definitions. Among these definitions, three sub categories emerged:

(1) What they are or should be (*N statements* = 6) which included:

- "Stereotypical," Respondent 093
- "General standards for all stakeholder," Respondent 083
- "Representative," Respondent 093.

(2) What they should contain (*N statements* = 8), which included:

- "User demographics," Respondent 093
- "Goals, motivations, habits," Respondent 089

- "Needs, wants, goals," Respondent 069.

(3) What products designed with personas are supposed to have achieved, in other words, the desired outcome of use (*N statements* = 3) which included three statements from the same responder:

- "Ease of use," Respondent 022
- "User friendly," Respondent 022
- "Right content," Respondent 022.

Four different responders with UX Centric job titles provided six statements that were coded as positive; these included:

- "Fantastic for copywriting purposes," Respondent 004
- "Nice for working through cognitive walkthrough," Respondent 048
- "A useful guiding tool for research," Respondent 050.

Four responders also included five definitions that described personas negatively:

- "Difficult to use/put into practice," Respondent 101
- "Hard to sell internally," Respondent 121
- "Not always justified," Respondent 083.

There was less support for the focus claim among UX Centric responders. Two responders submitted three definitions that were coded as support for the focus claim:

- "The targeted user," Respondent 189
- "Segmentation," Respondent 093
- "Specific population," Respondent 189.

There was also evidence in two UX Centric respondent submissions to support the claim of communication. These statements were:

- "Good for working with marketing teams," Respondent 048
- "Help guide design decisions," Respondent 121.

The criticism that personas become overused and stale was supported by Respondent 050 when he wrote that personas were:

- "A potential hazard if personas are blindly followed without frequent reevaluation," Respondent 050.

The perception that research was an important aspect of personas was emphasized by seven different (44%) of the UX Centric survey respondents with eight submissions. Most focused on a belief that personas were or should be based in research:

- "Market research," Respondent 189
- "Research (or data)-based," Respondent 095
- "Research-driven," Respondent 081
- "Must be based on real research," Respondent 084
- "Must be valid and based on actual data to be successful," Respondent 121.

However, three submissions suggested that personas were not based enough in research:

- "Never enough data," Respondent 081
- "Not always good for presenting to data-driven stakeholders," Respondent 048
- "Based on gut and hopes more than solid external research," Respondent 004.

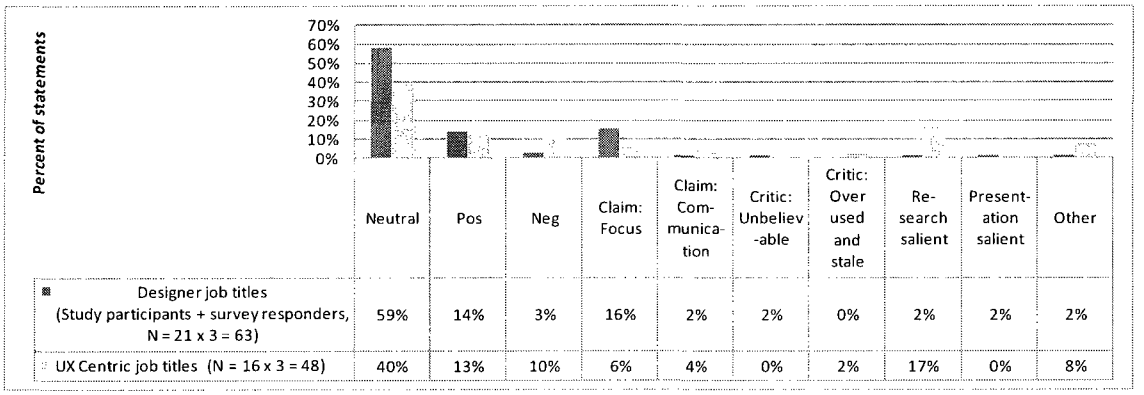
8.1.2.1d: Designer versus UX Centric job title responses. Designers and UX Centric responses focused on different aspects of personas when asked 'what were the first three things that come to mind', see Figure 78 for a summary of how the

statements and definitions were coded. Designers were more likely to support the focus claim and had more positive things to say. Conversely, UX Centric responders were much more likely to focus on the importance of research. A summative description of three personas' qualities from Designers could read:

- "Personas (1) help focus on representations of the targeted people/users/roles who are expected to use the product, (2) describe user abilities and how users will interact with the product and (3) they are helpful summarizations that act as a reference."

Conversely, a statement from those with UX Centric jobs might read:

- "Personas (1) need to include user goals, needs, and desires, (2) can be useful for communication and narrowing the user audience, and (3) are not convincing if they are not based on research data."



	Neutral	Pos	Neg	Claim: Focus	Claim: Com-munica-tion	Critic: Unbeliev-able	Critic: Over used and stale	Re-search salient	Present-ation salient	Other
Designer job titles (Study participants + survey responders, N = 21 x 3 = 63)	59%	14%	3%	16%	2%	2%	0%	2%	2%	2%
UX Centric job titles (N = 16 x 3 = 48)	40%	13%	10%	6%	4%	0%	2%	17%	0%	8%

Figure 78: Percent of coded responses in each category - Personas

8.1.2.2: Context scenarios (Marco)

While Marco does not directly answer the 'first three things about scenarios' question, focus, stereotype avoidance and the importance of perceiving research as rigorous, all are evident in Marco's scenario definition.

Cynthia And what about the first three things that come to mind when you think about scenarios?

Marco Yeah. I think scenarios are good, because they help put that persona in an even more specific context. So, it's not just the person, but it's, like, their daily experience or a common experience for them.

Cynthia	Okay. And when you say good, how does that help designers?
Marco	It's good in the sense that it helps us focus in a particular direction. It helps us get away from certain assumptions we might have. The drawback is that they should be pretty accurate because we treat it as a reference at that point. I mean, it's almost factual and that's good and bad, because, you know, if the person creating that persona or writing those scenarios doesn't do their research properly, then all of a sudden it's misinformation that we take for truth.

8.2: Last Experience

I asked study participants with persona experience ($N = 5$) and survey responders ($N = 32$) about their last experience using personas. Additionally, I asked Marco about his last experience using context scenarios. The following sections present the question and data analysis procedures (section 8.2.1), findings from the study participants (section 8.2.2), and findings from survey responders (section 8.2.3).

8.2.1: Question and data analysis procedures

In the next sections, I discuss the questions asked and the data analysis procedures for: (1) the last experiences with the methods as reported by the design study participants (section 8.2.1.1); (2) the last experience using personas for the survey respondents (section 8.2.1.2).

8.2.1.1: Design study participants

In the interview debriefing, I asked participants who had exposure to the persona and/or scenario methods to, "*Tell me about the last time you utilized personas.*" The answers were coded for: (a) project descriptions; (b) the respondent's implied role relative to the research (i.e. simply as a user versus having some role in the creation of the personas/scenarios); (c) mention of a perception-related independent variable (presentation, methods, sample size, background of research team and audience distance); and (d) evidence of claims or criticisms. In the case of context

scenarios, I also analyzed Marco's answers for any mention of context scenarios adding cultural information. I also noted other emerging themes.

8.2.1.2: Follow-up survey respondents

The survey question was worded slightly differently from the design study question. Survey responders were asked to, "*Describe the last time you utilized personas. What was the project, presentation mode, and how did you feel about them...etc.?*" The answers were coded for the same information as the studies (see above). However, after asking to describe the last experience with personas, survey responders were asked three additional sets of questions which were not asked of study participants. Survey responders were asked: (1) to rate (from one to five) the success of their last experience using personas (section 8.2.1.2a); (b) to describe the content contained in the personas in the last experience (section 8.2.1.2b); and (c) to rate level of organizational support in the last experience (section 8.2.1.2c).

8.2.1.2a: Perceived success of personas. Survey respondents were asked first to rate the success of their last persona experience, then asked to explain why they gave personas the rating. The open-ended responses were coded for claims/criticisms, mention of perception related variables and any discussion related to the exogenous moderator variables.

8.2.1.2b: Persona content. Survey respondents were asked to report on what was contained in the personas the last time they had used them and to reflect on what they found useful and what was not useful. This question was asked only of those responders who reported that they were 'users' of personas; as such, almost all of the responders were from the group with Designer job titles. Reports were categorized by what responders considered useful and what was considered extraneous.

8.2.1.2c: Level of organizational support. Survey respondents were asked to rate the level of organizational support in their last persona experience. A chi-square test was employed to determine if there was an association between the success rating (above) and the level of organizational support.

Additional non-parametric statistical tests were employed to investigate if perceived success and organizational support were associated with any of the other established designer-related independent variables (profile, empathy, design cognition, HCD orientation alignment, and the number of previous experiences).

8.2.2: Findings: Last experiences - design study participants

The participant discussion pertaining to their last experience is presented from the lowest experience level to the highest (sections 8.2.1.1 – 8.2.1.5).

8.2.2.1: Leanne (Experience level 1 of 10: low group).

Leanne conveyed a last persona experience for a project in which she helped develop a web-based shopping site for a local retailer. She described the personas as part of marketing. As such, the personas were developed as segmentations of the retailer's customer in general and were not specifically focused on the web presence.

Leanne	And I wouldn't say I was handed, like, a persona per se... we were handed these like branding packets and they really talked about what [retailer name] was and what their customers were all about. So, at the time, I guess, because, I don't know, I guess it didn't really feel as being a developer, but I was really part of marketing.
Cynthia	Okay. So it felt like it was part of marketing.
Leanne	Right.
Cynthia	Were they at all geared towards a web presence? Or, were they actually talking about the people who come into the store?
Leanne	No, they . . . I think it was actually . . . Well, it's just about the service. ...Because, you know... [retailer name] is, like, known for their....personal service.

I asked Leanne if anything about the personas surprised her in her last experience in order to investigate stereotype avoidance (replacing ill-informed assumptions). I also asked about the level of organizational support. In this exchange, Leanne implies that the level of polish for the presentation was indicative of a high

level of organizational support; however, she was not terribly impressed with the presentation.

Cynthia	Did the information surprise you or were you like "oh, I already knew all that"?
Leanne	Oh. Yeah. It's never really surprised me.
Cynthia	Never surprised you. Okay. And, that time at [retailer name] when you were given personas was the company supportive?
Leanne	Yeah. I would think that they were very encouraging and definitely spent time on the presentation.
Cynthia	Okay. So, it was just that one presentation?
Leanne	Yeah.
Cynthia	Okay....Were they like one-sheet things or...?
Leanne	They weren't actually user profiles. They were these like weird, they almost looked like greeting cards. ... I mean like fancy greeting cards, you know. ...But it just like a certain type of, you know, like a certain image or type of person that shops at [retailer name], or that they wanted to shop at [retailer name], or who you would be if you shopped at [retailer name], or something like that.

Since Leanne described her last experience with the retailer as not '*personas per se*', I asked about the last time she would say she used personas as she would define them. In this case, she focused on using them as part of a school project. Recall that she had recently completed a web development course at a local university. Her description recounted how she created mock users for a photography-based portfolio. She implied that her mock users helped with audience focus and facilitated empathy with her end user audience. She recalled this experience as a mental exercise without any actual user research.

Leanne	Basically, you know, I would sit down and think of people that would try to use . . . that would go to this website or be interested in looking at it. And I would sort of base it off of, like, a real person. ...Often they were like portfolio websites, so I would, you know, think that the types of users would be businesses, and other photographers.

Cynthia	You're a photographer?
Leanne	Yeah. like one of them was a photography-based portfolio. And I guess I would try to get a range of users. ...You know, I would pick like the library user, you know, the student who was on the lower socioeconomic scale...and would, therefore, have kind of like a slow connection. And like maybe a max time on ...computer usage. But would probably be very tech savvy. ...And then maybe someone who would like . . . like an office worker who was also very text savvy and sat in front of a computer all day long had really low attention span.
Cynthia	So this is basically you imagining the users at the other end. There was no research going and talking to these people and saying, "oh, how would you use this?" and that kind of thing?
Leanne	Yeah. ..that's right.
Cynthia	So it was just trying to get you kind of outside of your own head?
Leanne	Yeah.

8.2.2.2: Lucy (Experience level 2 of 10: low group).

Recall that prior to discussing last experiences in the design study, participants were asked to name the first three things that came to mind about the methods. I followed up the 'first three things' question by asking if any of the research materials could be described as personas or scenarios (I used this sequence for all ten participants). While all participants identified the documents as such, in Lucy's case it became apparent that she had held a different idea of what personas were prior to the study. She picked up the profiles and said that she guessed that they were personas but not as she thought of them. This exchange provided evidence for the criticism of over abstraction when considering the Kyrgyz personas:

Cynthia	Okay. Why do you say you guess they are? What's your holdback on it and what possibly puts them in that category?
Lucy	Well my holdback on that would be that . . . I know they're fake people. They're based on interviews with people of a certain type. But, I mean, they're trying to

	put forth, like, a character, a fictional person who might use this. ...I don't know. For some, to me it is a little less personal.
Cynthia	Okay. And when you say it's less personal, is that a negative thing?
Lucy	I don't know if it's a negative thing. I think it, kind of, distances the person a bit, because it's focusing more on their personhood...and not so much on them as an individual.
Cynthia	Okay. That makes total sense. In the screening survey you said that you had experience with personas. Can you clarify what you were thinking when you...?
Lucy	I think I was thinking of individual people. Like taking the responses of individual people and translating it into a group of like-minded individuals.
Cynthia	Okay. And, can you talk to me a little bit about maybe an experience you've had doing that?

While she did not see her interpretation of the term 'persona' as being aligned to the research documents, she clearly considered them as a sort of mock user construct. As Lucy discussed her last experience, she focused on how she used her family as a representative group of naive users for the geo-caching website on which she had worked. Timeline issues and the claims of empathy (for less experienced users) and focus (on a subset of users) are evident in the following discussion:

Lucy	We were actually doing Beta testing. We were getting ready for release. ... We didn't bring in a lot of outside people to work on it. It was mostly testing in-house. ...And, of course, everybody . . . being a computer company, everybody plays video games or has a lot of tech experience. So, we weren't really sure . . . Like, just because we could figure something out, we weren't sure that people with less tech experience could. So, in that case, I actually took the data program home on a pocket PC and I made everyone in my family play it. ...Because they were hitting, essentially, every category that the people in our office were not. Because my mom, not a techy. My dad, very intellectual, but born in the

	50s, still, kind of, getting used to the whole idea of computers. ...My sister's not interested in computers at all.
Cynthia	Okay. So, you, kind of, used your family as a sample focus group.
Lucy	Right.

As our conversation continued, she described using her family research to convey possible interface problems to the rest of her design team. This exchange provided evidence that she is trying to help other members of the team to abandon their own assumptions and stereotypes about the end users, but she was ultimately unsuccessful due to a lack of organizational support and budget shortcomings.

Cynthia	Okay. So, after that experience of using your family...you come back into the office and what did you tell people? How did you tell them about what happened?
Lucy	Well, I made notes. ...This is all a GPS enabled program. None of them ever used GPS before at the time. ...So, they didn't know how to use the compass arrow. I mean (laughs), this was really basic. ...These people know nothing.
Cynthia	Did that change any of the decisions on the interface, based on the data you got from your family?
Lucy	Well, no, because the boss....kind of, overruled the decisions. ...Or, the suggestions that we sent him.
Cynthia	So, did you feel like maybe the product that was released could have been better?
Lucy	Oh, it could have been a lot better. Most definitely.
Cynthia	And when you say, it could have been a lot better, was it just adding those things for the more naive user, or were there lots of things that you felt...?
Lucy	We didn't... I think there were 16 people in the office, so we didn't even have, like, a dedicated data collecting team. It was just us. ... this was really, kind of, shoestring. But I think, yes. I think there should have been a lot more usability testing, because we really didn't do anything. It was just a bunch

of computer geeks saying, hey, that's really cool. Let's make this.
...And then they made it and it turned out that people who weren't also computer geeks, or weren't gamers, really couldn't figure it out.

This exchange with Lucy indicated that there is also variation in the understanding of the term 'persona' among UX professionals. While she claimed to have experience with personas on the screening survey, when asked to discuss that experience, it became clear that her concept was not exactly what is expected from the literature. However, her reasons for using her family as an exemplary of inexperienced users had similar goals as personas defined by the literature. In other words, she was hoping to help her co-workers focus and empathize with less experienced end users while avoiding their assumptions and stereotypes that the users were similar to themselves. She also used her family example as a communication conduit to facilitate these goals. As such, I kept Lucy's data as a persona informant.

8.2.2.3: Marco (Experience level 6 of 10: medium group).

Recall that Marco had the most experience using personas and context scenarios; he claimed to have used them in eight projects over the last ten years. When we began our conversation, Marco suggested that there has been a shift in how his company uses personas because of stereotype confirmation.

Cynthia About how many projects have you been given personas to work on?
Marco Oh, say, I guess maybe eight.
Cynthia Eight?
Marco Yeah.
Cynthia And about how many projects were you given scenarios?
Marco Oh, they're almost hand-in-hand.
Cynthia Hand-in-hand?
Marco Yeah.
Cynthia Okay. So, you usually get one and the other together?
Marco Yeah.
...Well, I think this year on [product name] it's probably the first time we've had scenarios without personas.

Cynthia Okay. So, they've given you scenarios without personas?

Marco Yeah.
...Which I thought was pretty interesting.

Cynthia Okay. What did you think was interesting about that?

Marco Just having the scenarios and removing the personas from the thing *(by 'thing' Marco was referring to the UX research given to the design team),* because we were finding that people held on to personas and they were creating personas to fit their needs.

As the discussion continued, Marco described an organizational situation in which personas were created by non-researchers and then later utilized as justifications for features during conflicts (i.e. stereotype confirmation criticism). Marco suggested that he did not value personas that he felt were created without research and found them unbelievable.

Marco You know, they *(by 'they' he was referring to developers)* created personas that were really geeky and really engineer-focused, because, you know, there was no persona...and then all of a sudden they had this persona for a feature... and they couldn't do anything to that feature, because that's how that persona likes it. It was almost like a reversed justification.

Cynthia Okay. When you say people were creating personas . . . so, these were designers and developers or were they researchers?

Marco Mostly developers. It was developers and engineers. It was kind of ...You know, they saw this persona as a tool and they almost ...they held on to it, but kind of misused it…it was almost like a reverse justification for them.

I refocused Marco on his last experience. In this exchange, he provided further evidence of stereotype confirmation being a problem in his workplace:

Cynthia So, tell me a little bit about the last time that you were given personas.

Marco I think the last time was for [product name] timeframes. I mean, it's a couple years ago.
...And it did seem that people were really holding onto personas and starting to make assumptions about that

persona as opposed to actually using the information in the persona.
...Like, they knew...One of the personas was a house mom.
...And, you know, people would make assumptions about what house moms like and don't like without really going back to all the background information in that persona.
...It almost became a convenience instead of a research tool.

8.2.2.4: Maria (Experience level 7 of 10: medium group).

Maria was the only participant to call the profile documents personas in the preamble. When asked about her last experience, Maria felt that the personas were not believable due to insufficient research and that a short timeline was partially to blame.

Cynthia Can you talk about the last time you were given personas?

Maria It was done not in the best way.

Cynthia Okay. Tell me about that.

Maria It was for a project based in the UK and there was just so much to do within a short amount of time. So another interaction designer did the personas within a few hours.
...So, it's not based on actually talking to these people, but sort of like make-believe personas.

Maria went on to explain that in her educational experience she was told that without the time or budget to conduct research that it was acceptable to create personas based on prior knowledge. Again, she expressed lack of believability when personas were created without adequate research. Additionally Maria felt that this practice undermined the legitimacy of UX researchers.

Maria I didn't go to that lecture, but I think [the instructor] did a lecture where you create personas just out of nowhere.
...Because there's a tight budget and you don't have the time or the resource to interview people and do something in a really proper way, the way Alan Cooper and his company would do it.

Cynthia Okay. Talk to me a little bit about how you feel about that.

Maria	It's dangerous. Because in most corporate settings, UX designers don't have a lot of respect. It's a big fight.
Cynthia	Okay. Talk to me about that.
Maria	And to create personas without actual quantifiable information, it's just like opinions. Right?

As our conversation continued, Maria suggested that her perception of the credibility of the research team and sample size were also important to persona validity. Towards the end of this discussion, she also indicated that UX research is: (a) currently struggling for legitimacy; and (b) emphasized less during recessions suggesting that budgets (or lack thereof) are partially responsible for personas misuse. This exchange continued:

Maria	And to create personas without actual quantifiable information, it's just like opinions. Right? ...Anybody can do it. An engineer can do it. So, it seems less valid. Whereas, if you have actual data backing up the information saying, you know-it seems like you guys do-then it seems more credible. Nowadays, people seem to want numbers behind the information.
Cynthia	When you say nowadays, that sounds like there's been a shift. Since 2004, has there been a shift at some point?
Maria	Well, I think it's more based on my experience. It seems like more of a fight. I mean, like, if you want to make design changes, you just can't do it because it looks good. You have to say, oh, okay, because of this web-metric information, it seems like it's a good idea. ...Or, you know, you can say...we interviewed a hundred people and 80% of them said, you know, they prefer it this way. So, actual numbers...That's my opinion, but... ...It's more of a struggle especially in a recession, I think, for US designers. So, just personas out of the hat...I mean....that may work in a more understanding culture, but for places that are really tech-heavy, where engineers are seen as Gods, it's hard.

8.2.2.5: Hannah (Experience level 9 of 10: high group).

Similar to Lucy, when asked to identify the personas and scenarios, it became apparent that Hannah's perception of scenarios coming into the study differed from what was presented in the research materials. In the screening survey, she had written

that she "used scenarios extensively to explain how end users would use the software to developers." When I asked her if she had used documents like these personas and context scenarios, she said that she had only used or created personas as part of a classroom experience and that she had never created or used documents like the context scenarios provided for the task. I asked her to explain her perception of scenarios in this exchange:

Cynthia	And talk to me about how these are different from the scenarios you typically create to communicate with your developers.
Hannah	They are more like online flowcharts.

In our discussion about her last persona experience, she concentrated on a classroom experience with personas. Like Maria and Lucy, in Hannah's classroom experience, there was a lack of research used to create the personas.

Hannah	And this was just one of the exercises we had. This was the picture and the requirements... (inaudible) developed persona.
Cynthia	Okay. And so what was your process in creating those?
Hannah	We just did one persona. ...And it was a group project. ...So, I'm trying to think of how we… I think that it was specific for, you know, a software application we were working on. …I'm trying to remember. I think, you know, I drafted something out and then somebody, who was closer to the application, made it for real. It was, kind of, made up about who was the potential user. ...Yeah. It was for a university application, so I just made some things up about who that, you know…my understanding. And then somebody who was closer to the application made it more real in terms of how she understood the students were using applications.

8.2.2.6: Summation: Design study participant last experiences.

Context scenarios were only discussed by Marco who suggested that his company was focusing more on using context scenarios as research summarizations

due to the 'misuse' of personas. In the discussion of personas, the two participants with the most persona experience (Marco and Maria) were somewhat negative about their last experiences; the remaining participants were fairly neutral, see Table 32.

Table 32: Summary last experience - perception

		Perception related variables			
	Overall impression	Research discussed	Research team (who creates)	Presentation discussed	Sample size discussed
Leanne	Neutral	Yes		Yes	
Lucy	Neutral	Yes			
Marco	Negative	Yes	Yes		
Maria	Negative	Yes			Yes
Hannah	Neutral	Yes			

Research was discussed in some way by all of the participants. Non-rigorous classroom methods were discussed by Leanne, Maria and Hannah suggesting that the way the method is often taught does not emphasize rigor. This fact really bothered Maria who felt that it made the personas unbelievable, see Table 33. Marco also expressed doubt about personas that were created by engineers suggesting that the persona method was often hijacked by professionals who were unqualified (in his opinion) to do so. Only Leanne discussed presentation and only Maria implied that sample size (or 'numbers') was important.

Both Marco and Maria provided evidence that they did not find personas believable when the research was not considered rigorous. Lucy identified the criticism of over abstraction when she suggested that the Kyrgyz personas were not believable because she knew they were fiction. Marco, who had extensive persona and context scenario experience, conveyed stories of stereotype confirmation at his place of work. Only Leanne's and Lucy's last experiences were coded for any of the claims, see Table 33.

Table 33: Summary last experience criticisms and claims

	Criticisms			Claims			
	Not believable due to lack of research	Over abstraction	Stereotype confirmation	Focus	Communi-cation	Stereotype Avoidance	Empathy
Leanne				Yes			Yes
Lucy		Yes		Yes		Yes	Yes
Marco	Yes		Yes				
Maria	Yes						
Hannah							

Exogenous variables (organizational support, budget, and timeline) were a concern to three participants, see Table 34. In Leanne's experience the persona-like marketing segments that were given to her at work had extensive organizational support; however, this did not seem to affect their believability or usefulness for Leanne. Conversely, Lucy, who was trying to conduct an audience analysis of her family to inform the web-based interface that she was working on, was not at all supported by the organization in her efforts. She also suggested that a tight timeline was partially to blame for the lack of user data in the project. Finally, Maria discussed all three exogenous variables suggesting that tight budgets and short timelines forced UX professionals to make shortcuts which in turn lead to non rigorous methods and a lack of believability.

Table 34: Summary last experience - exogenous variables

	Exogenous variables			
	Budget	Timeline		Organizational support
Leanne				Yes
Lucy		Yes		Yes
Marco				
Maria	Yes	Yes		
Hannah				

Both Maria and Marco suggested that the use of personas and scenarios has shifted since they began their careers. In the case of Marco, the shift in his workplace is away from personas altogether. Maria also describes a shift away from personas, but argued that the shift was due to a combination of factors including: (a) lack of rigorous

research in their creation resulting in a loss of credibility; (b) a corporate culture that does not see value in personas; and (c) a trade-off corporations are making in times of recession (i.e. budget issues).

Another emergent theme was the mention of conflicts between designers and developers regarding UX research. Lucy and Maria suggested that developers had wielded the largest amount of control and consequently made interaction choices based on their own experiences rather than consulting UX research. Additionally, Marco suggested that developers had a tendency to misuse personas, hijacking the method to create personas on their own without user research.

8.2.3: Findings: Last experiences – follow up survey responders

Last experiences using personas for the follow up survey responders were explored in five sections: (1) a description of the last experience (section 8.2.3.1); (2) a rating of the success of the last experience (section 8.2.3.2); (3) the content contained in the personas in the last experience (section 8.2.3.3); (4) the level of organizational support for personas in the last experience (section 8.2.3.4) and (5) interrelationships among the last experience findings and established Designer-related moderator variables (section 8.2.3.5). Finally in section 8.2.3.6, I summarize the last experiences findings for the survey responders.

8.2.3.1: Last experience description

Note that the wording of the question in the follow-up survey was different from the design studies. The survey asked responders to, "*Describe the last time you utilized personas. What was the project, presentation mode, and how did you feel about them...etc.?*" This question phrasing resulted in a greater concentration of responses that specifically addressed presentation modes when compared to design study responses.

8.2.3.1a: Designer job titles (N = 16, coded N = 14). In the following sections, Designer respondents describe the types of projects in which they were involved, the

respondent's implied role relative to the personas (i.e user/creator), unsolicited mention of perception-related variables, evidence of claims or criticisms, and comments alluding to exogenous variables.

- *Types of projects.* Seven of the 14 coded responses (50%) of responders included a description of the projects in which personas were used or created; the projects were wide ranging from websites to applications. Four submissions were concerned with redesigns of an existing product or website:
    - "Project was about redesign of online application and use," Respondent 085
    - "The project involved developing a portable maintenance information retrieval software product used by mechanics at airlines, previous version of the same product," Respondent 071
    - "Created personas for my company's web site that I am redesigning," Respondent 079
    - "The personas created for the previous version of the same product," Respondent 007.

  Other projects included:
    - A classroom project of "a futuristic mobile device for physical therapists," Respondent 178
    - "Portable maintenance information retrieval software product used by mechanics at airlines," Respondent 071.

- *Respondent's implied role.* Nine of the 14 coded responses (64%) of responders included a description of their role relative to the personas: five (36%) described themselves as 'users' of the personas, and four (29%) described their role as including the creation of the personas.

  There was an additional reference for role in the follow-up survey where responders were asked specifically to determine their relationship relative to personas. I compared the answers to each for internal reliability. Among the

nine responders who implied a role in their response about their last experience, there was a high level of agreement between their implied role and their identified role relative to personas: seven of nine (78%) of responders had a consistent role.

- *Perception related variables.* Two perception-related variables were found in the responses: (1) the type of research used; and (2) the presentation of the personas.
    - *Types of research used.* In five of the 14 coded responses (36%) Designer responders described the research that was conducted for the personas. Two discussed how they personally were responsible for interviews with stakeholders, for example:
        - "I relied on interviews with business stakeholders," Respondent 094.

      Two other respondents reported on relying on previous personas:
        - "Previous project's persona example for reference," Respondent 085
        - "Used brainstorming (ideation, storyboarding) for researching...we also used ethnographic studies and contextual inquiry," Respondent 178.
    - *Presentation modes.* Six of the 14 coded responses (43%) responders included descriptions of how the personas were presented in their last experience. Two respondents reported that personas were presented as "*fact sheets*" the last time they were used. Three responders reported that the personas they used or created were presented as a poster, for example:
        - "Posters with quick bullets and graphs, along with a picture," Respondent 077.

      One respondent wrote that the personas he helped create were incorporated into a website:

- "Presented on a website and incorporated into specs," Respondent 009.

- *Claims and criticisms.* In four of the 14 coded responses (29%) Designer respondents alluded to persona claims in their descriptions of their last experience. Focus was implied by two responders, for example:
  - "Gave me a target to design towards," Respondent 077.

  Empathy was alluded to in Respondent 079's response:
  - Used personas in a "...project to get a better feel for what they needed on the website, their pain points, etc."

  Increased communication was implied when Respondent 007 wrote of how previous personas conflicted with the new personas for the same product:
  - "...which led to discussion trying to understand why we should believe these personas were better than the last set."

  There was no evidence of any persona criticisms in the responses.
- *Exogenous variables.* In the Designer group, only Respondent 040 discussed trade-offs due to budget when she wrote:
  - "We don't have time to develop detailed descriptions of all our user groups...we just generally discuss who we are trying to reach, what benefits they would want from us, and how we can implement those requirements into our product."

8.2.3.1b: UX Centric job titles (N = 16, coded N = 16). In the following sections, UX Centrix respondents the types of projects in which they were involved, the respondent's implied role relative to the personas (i.e user/creator), unsolicited mention of perception-related variables, evidence of claims or criticisms, and comments alluding to exogenous variables.

- *Types of projects.* Eleven (69%) responders with UX Centric job titles included the type of project involved with their last persona experience. Some were very specific, including two Microsoft products:
  - "Zune product line," Respondent 189

- "Project for MS SharePoint," Respondent 050
- And a Yahoo product, "Yahoo! Games," Respondent 095.

Redesigns of websites were discussed by two respondents including this submission by Respondent 081:

- "We were redesigning a Fortune 500 company's newsroom section and needed to address a few different audiences."

The remaining six reports did not follow any particular theme, including:

- "Software for a biological system," Respondent 093
- "Phone targeted towards women who are fashionable," Respondent 121.

- *Respondent's implied role.* Twelve (75%) responders included an implied role relative to the personas in their descriptions. One respondent was given personas to use for usability; and the remaining eleven responders described their role as including either research and/or persona creation. When analyzing consistency between the roles explicitly identified by responders in the follow-up study, there were no inconsistencies.
- *Perception related variables.* Two perception related variables were discussed: (1) type of research used; and (2) sample size.
  - *Types of research.* Twelve (75%) of UX Centric responders described the research that was conducted for the personas. Nine of the twelve reports discussed multiple methods:
    - "Field research," Respondents 048 and 083
    - "Interviews" or "interview-based usability," Respondents 076, 101 and 093
    - "Online surveys," Respondents 076, 004, 084 and 101
    - "Phone interviews," Respondents 004 and 084.

Other methods discussed included ethnography and focus groups (Respondent 083), review of online discussion boards (Respondent 004) and contextual inquiries (Respondent 095).

- *Sample size.* Compared to Designer job title responders, UX Centric respondents were more likely to include the sample size in their submissions; three respondents specifically identified the sample size of their research which ranged from 8-30 participants.

- *Claims and criticisms.* Two (13%) respondents with UX Centric job titles alluded to persona claims in their descriptions of their last experience. Respondent 081 alluded to empathy and focus claims when she wrote:
  - "Even though we had no budget for research, we felt that we needed personas to help focus the design efforts on the audience, instead of on the internal business unit's needs."

  Respondent 004 also implied support for the focus claim when she wrote that creating personas was:
  - "Often informal, but tremendously helpful nonetheless, especially for key sales points and taxonomy."

- *Exogenous variables.* There was one report from the UX Centric responders that discussed the trade-offs that became necessary in personas' development due to exogenous variables. Respondent 081 wrote:
  - "We created "faux-sonas" because we had no research budget and no existing data."

8.2.3.1c: Summary of survey descriptions. The implied roles followed the consistent theme of other findings in this dissertation work, in that Designers were more likely to be 'users' of UX research and UX Centric job title responders were 'creator/conductors', see Figure 79.

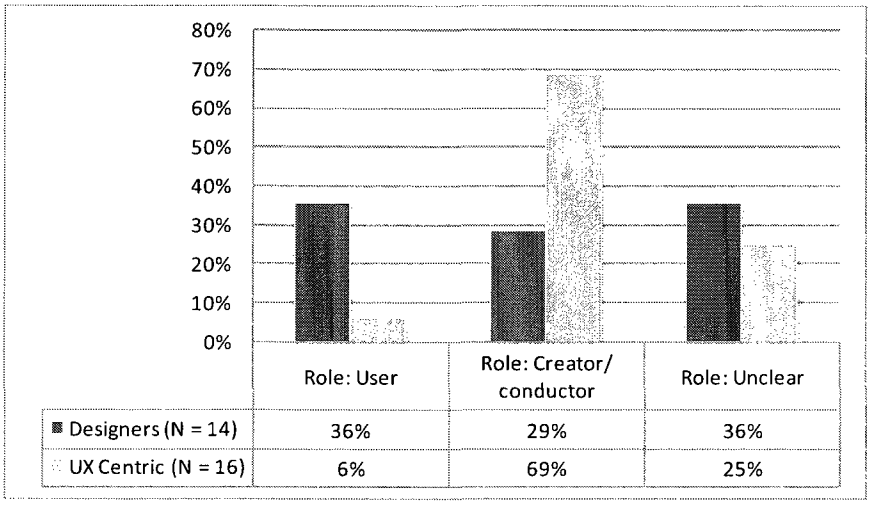


Figure 79: Last experience implied role - personas

I also explored if a Designer's implied role in their last experience description was associated with how the personas were discussed. Of the four Designers who implied a role of creator/conductor, three talked about research methods and did not include a presentation description; as such, their responses were much more aligned to the UX Centric group when considering the perception related variables. Of the five Designers who implied a role of user, three focused on the presentation and only two included a research description. Additionally, the user group was more likely to provide evidence of persona claims.

UX Centric responders were much more likely to include the types of research used and the sample size when commenting on their last persona experience, see Figure 80. Conversely, Designers focused more on how the personas were presented. There was one mention of budget issues negatively affecting persona creation in each group.

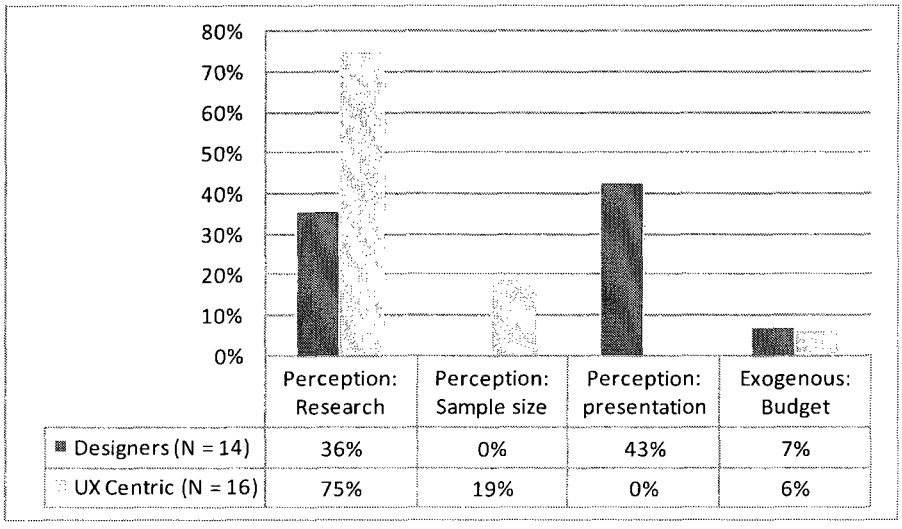


Figure 80: Last experience perception related variables – personas

Lastly, there was minimal unsolicited mention of claims when asked about the last experience, see Figure 81. There was no evidence in any of the submissions of persona criticisms.

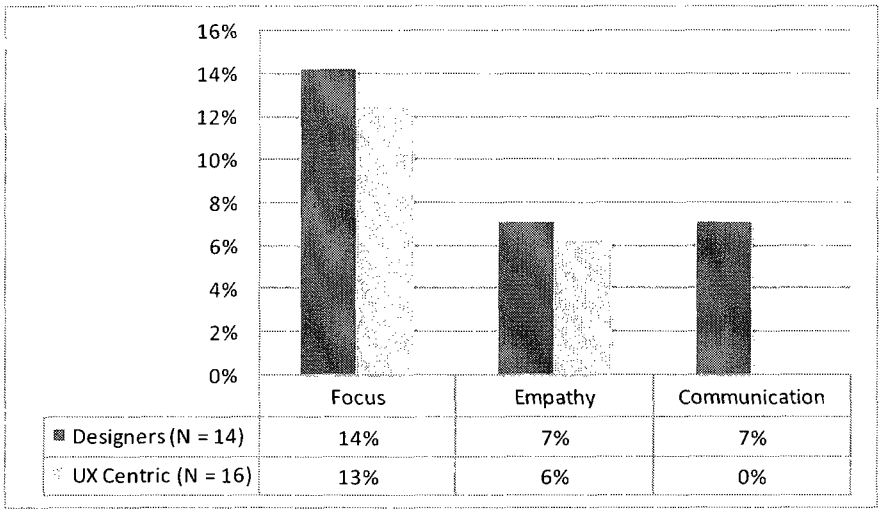


Figure 81: Last experience claims - personas

8.2.3.2: Perceived success of personas in the last experience

Survey respondents were asked to rate the level of effectiveness of the persona method in their last experience. Ratings were given in a five point scale ranging from very effective to very ineffective. Following the rating, respondents were asked to

explain why they had rated the method the way they did in an open-ended question. The following sections present the ratings followed by the explanation for why the respondents rated the last persona experience at that level. The discussion is followed by a summary of the perceived success of personas in the last experience.

8.2.3.2a: Ratings. Designers ($N = 16$) rated personas slightly higher than those with UX Centric job titles ($N = 16$); however, the differences were not statistically significant, see Figure 82. Average rating of success for the last personas use by Designers was slightly below effective ($M = 3.63$, $SD = .86$), and about at neutral for UX Centric job title responders, ($M = 3.25$, $SD = 1.18$).

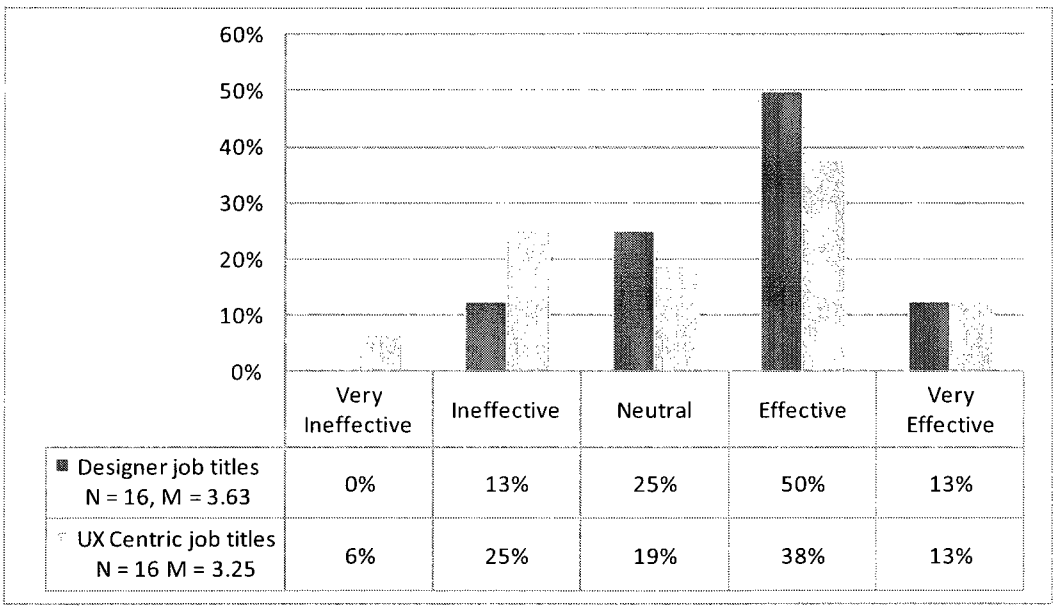


Figure 82: Persona last experience success by job title type

8.2.3.2b: Explanation for rating. This section explores the reasons responders rated their last persona experience at the level they had in the previous question. Findings for Designers are presented first, followed by findings for UX Centric job title responders.

- *Designer job titles (N = 16)*.The section details responses from each level of perceived effectiveness for personas from Designer job title responders.

- *Very Effective rating.* Two (13%) responders with Designer job titles rated personas as very effective the last time they had used them. Respondent 077 wrote that they deserved this rating because the personas were:
    - "Based on field studies and true."

  This respondent's reason for his rating suggests that he found the validity of the research supporting the personas persuasive and that 'field studies' were a reliable research method. Respondent 007's reasoning directly supported the communication claim of personas; i.e., that the personas helped in decision making among his design team:
    - "During the design phase, we frequently referred back to the personas to help resolve difficult decisions...the personas were also critical in fine-tuning which scenarios are effective."

- *Effective rating.* Eight (50%) responders with Designer job titles rated the success level of personas as effective the last time they had used them. Respondent 040 directly addressed the importance of sample size and expressed a skepticism of the method his team used when he wrote,
    - "We discussed each persona enough to get a good idea of what was required, but by no means did extensive research to determine those requirements...it was mostly through industry experience and interviewing persons in those categories...talking directly to people we are targeting can be very helpful, but at the same time a small sample size limits effectiveness."

  Respondent 019 addressed the importance of the background and education of the research team when he wrote that the
    - "Effectiveness was closely related to the experience of the person (researcher I guess) who produced the persona. They are not easy to create..."

Respondent 019's statement also implied evidence to support the criticism that personas required the specialized skills of a social scientist.

There were three respondents who rated the last experience effective but had a somewhat negative description of personas. My interpretation of this was that they were defending why they did not give their last experience a 'very effective' rating versus the lower 'effective' rating. The three responses were:

- "The personas were pretty limited in that they only reflected one axis of the user complexity," which supported the overly abstract criticism, Respondent 184
- "I have also observed users on site...the persona does not match my experience of the users I saw," which was related to the unbelievable criticism, Respondent 104
- "The personas were not as effective as they could be because they were not targeted at our specific software product, but instead were more about the general airline mechanic community," which suggested evidence for the overused criticism, Respondent 071.

While not a dominant trend in the data, this finding is interesting because it demonstrated that while Designers may rate personas as effective they may still hold reservations about the method.

- *Neutral rating.* Four (25%) responders with Designer job titles rated the success level of personas as neutral the last time they used the method. Respondent 178 felt that personas were unhelpful in communication:
  - "The persona seems to confuse *(the process)* many times during the brainstorming session."

Two respondents addressed the importance of presentation, for example:

- "Wordings w/o visuals are ineffective," Respondent 180.

Respondent 079 expressed frustration at the way personas have been presented when she wrote:

- "In all of my experiences, the personas were well-thought, but never referred back to...the experts say to plaster the personas on the walls in the area where development and design occur, but it has not been a practice where I've worked. ..I have suggested it to my team this week, in fact, and did not get any feedback one way or the other."

- *Ineffective rating.* Two (13%) Designer respondents gave personas an ineffective rating. One respondent felt the reason the personas were ineffective was because of a lack of company support:
  - "Again the organization was so large, and my PM/team didn't really believe in UX...I was the only one...it was like pulling teeth," Respondent 070.

- *UX centric job titles (N = 16).* In this section, responses from each level of perceived effectiveness for personas from UX Centric job title responders are reported.
  - *Very Effective rating.* Two (13%) responders with UX Centric job titles rated personas as very effective the last time they had used them. Respondent 082's submission supported the claim of focus when he wrote that personas:
    - "Showed the team how they could use the personas to focus on what features they should spend time."
  - *Effective rating.* Six (35%) responders with UX job titles rated the success level of personas as effective the last time they had used them. Just as with the Designers, the reasons did not support how effective the personas were, instead focused on issues that made the experience less than optimal. Respondent 069's answer provided evidence of the criticism that personas require training to understand how to use them:

- "The personas were effective because they helped identify few of the goals / usage scenarios," supporting the focus claim. The personas weren't REALLY effective because their importance was not clearly communicated to the Development team and how the Design team uses them. So when I came into the project, I had to invest my time in explaining the designs to the Development team (who had already implemented the designs) all over again. The Dev team had simply done a copy-paste job without understanding the nitty-gritty of the design approach or the application."

Two responders addressed the importance of research. Respondent 101 wrote:

- "I think the personas contained a bit too much "color" (e.g., information about their personal lives) and not enough fact/research-based information," Respondent 101.

This was also a new criticism; i.e. that personas do not contain the right kind of information to help with design. Conversely, Respondent 081's response concentrated on the unbelievable quantity of personas due to insufficient research:

- "The lack of real data. While we did what we could, the final product was still open to a lot of "well, how real is this?" questioning by the client."

Finally, Respondent 004 did not feel personas (or any method) had the capacity to increase empathy with end users. She wrote:

- "No matter how much information you give people or how much you try to drive it into their heads, most people are unable to put themselves into another person's mind in order to really grasp a persona or how to use one when developing a site, content or marketing propositions. It takes an actor's talent and most people are too lazy or lack it."

- *Neutral rating.* Three (18%) responders with UX Centric job titles rated the success level of personas as neutral the last time they used the method. Respondent 083 focused on the need for company support in personas use when he wrote that:
    - "Corporate attitudes were resistant to most manner of research, including personas *(sic)*."

  Respondent 050 gave the persona method a neutral rating because:
    - "The personas were somewhat limited in depth due to practical constraints. They were accurate for recruiting and guiding usability research, but less useful for high-level designing."

  This supported a new criticism, also found with Respondent 101's submission, that personas do not contain the right kind of information to help with design.
- *Ineffective rating.* Four (25%) UX Centric job title respondents gave personas an ineffective rating. Three respondents felt that the personas were not being used by the design team, thereby rendering them ineffective, for example:
    - "Personas were only used by the people who needed them the least! – the intended audience was not interested in using them for design work," Respondent 076
    - "The personas were used more to help the client team comprehend the research, prioritize requirements, and to keep the user needs involved as the client team made decisions along the way. The personas were not used within the design/development team as much as they could have been," Respondent 084.

  Finally, Respondent 095's submission supports the communication claim, but with a caveat,
    - "I think it was very effective for communicating but I'm not sure the team used it going forward."

- *Very ineffective rating.* One (6%) UX Centric job responder felt that the persona method was very ineffective the last time it was used. Respondent 093 wrote,
    - "The development team never worked with a user experience person before. They really didn't have any interest in anything that didn't involve them chatting about the system. It has been a frustrating experience."

  This submission supported the need to train Designers on methods before attempting to use them.

8.2.3.2c: Summary of perceived success. Most respondents rated their last experience with personas between the neutral and effective levels. More than half (63%) of Designers have a favorable opinion compared to 50% of UX Centric responders. The three major reasons given for personas effectiveness were: (1) increased communication which helped decision making among design teams; (2) they were based on good research; and (3) they helped design teams focus by depicting goals and usage patterns. Three major reasons given for persona ineffectiveness were: (1) design teams do not know how to integrate them into the design and development process; (2) a lack of company support; and (3) the research used to create the personas was perceived as lacking in some way (i.e. too small of sample size or not actually based in research).

There was some evidence in respondents' answers to support the claims of communication and focus; however, there was also evidence from one Designer respondent that personas inhibited communication by confusing the design team "*during brainstorming sessions*."

Many of the submissions included criticisms. Respondents from both groups suggested that personas were not believable due to insufficient or bad data. One Designer respondent expressed that personas overly abstracted users, and another suggested that personas were used on a project for which they had not been designed

for (stale and overused criticism). UX Centric responders expressed frustration with the method because Designers either did not use them 'correctly' (i.e. Designers needed training), or that Designers did not use the personas at all. Two responders (one Designer and one UX Centric) suggested that personas did not contain the right kind of information to support design which introduced a new criticism; i.e., that the persona content was not useful. Finally, one Designer respondent implied that personas required the specialized skills of a social scientist in a response that focused on the perception related variable concerned with the background of the research team.

Many of the perception related variables were also expressed. Multiple responders from both UX Centric and Designer job titles mentioned the perceived rigor of the research. Ineffective presentation modes were voiced by one Designer respondent, as was inadequate sample size. As mentioned above, there was one Designer concerned with the research team.

Lastly, the exogenous variable of organizational support was mentioned by a responder from each group. Both expressed frustration at a lack of organizational support.

8.2.3.3: Persona content in the last experience

The next question on the survey asked about the type of content contained in the personas in their last experience. The question also asked respondents to reflect on what content was useful and what was extraneous. This question was only asked of respondents who had identified their primary role as 'users' of personas; as such, only findings for Designer 'user' respondents are presented.

Of the nine Designer respondents who answered this question, two (both who gave personas a neutral rating) did not separate their answers into useful/not useful. Of the remaining seven, two had rated personas as very effective, four as effective and one had rated personas as ineffective the last time he had used them. The next sections first explore what content Designers found useful in their last persona experience followed by what they found not useful.

8.2.3.3a: What Designers found useful about last persona experience: There were three categories of information that Designers reported as useful: (1) product/service related information; (2) general technical information; and (3) demographics. By far, the most often cited useful information was product or service related. This included the "*level of expertise*" (Respondent 007 and 104), tasks the end user would be expected to accomplish with the product (including the time on that task) (Respondent 007, 071, and 040), and what the potential end user currently found lacking in the current product/service (Respondent 040). General technical information which included information about internet usage and level of tech savvy-ness of the user were useful for two responders (Respondent 077 and 070). One responder felt that demographics were useful. Two responders felt that a name that reflected technical ability was important.

8.2.3.3b: What Designers did not find useful about last persona experience: There were two categories of information that Designers reported as not useful: (1) non-product/service related information; and (2) demographics and fact sheets. Several responders reported that information that was not directly related to the product was extraneous. Respondent 071 wrote:

- "What were not terribly useful were the hypothetical descriptions of the person's non-professional life."

Respondent 104 reported that "working conditions and personality" were not useful. In an expansion of this theme, Respondent 007 did not feel that creative touches intended to 'flush' out the persona character were actually detrimental to persona use:

- "The creative 'storytelling' touches giving details about the persona's personality, including names (e.g. Sally or Bob) and levels of impatience (this latter info I believed to be worse than useless because it went beyond the researcher's data to inaccurate generalizations that could have been improperly actionable in the design)."

Finally, in opposition to the responder who found demographics useful, Respondent 040 wrote:

- "What was not helpful was more numerical data, such as demographics."

8.2.3.4: Organizational support of personas in the last experience

In the final survey question regarding the last experience with personas, respondents were asked to rate the level of support (ranging from 1-5) they felt the method received from their organization, see Figure 83. There were no significant differences between job title types.

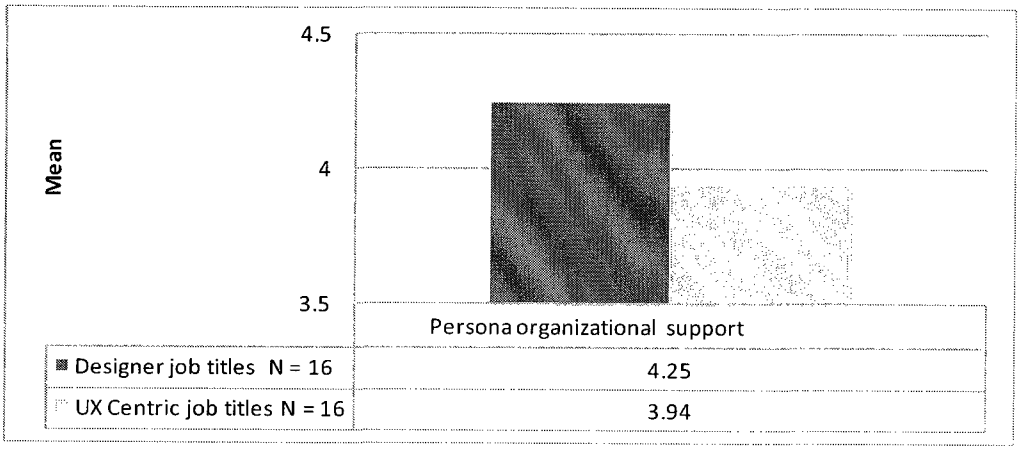
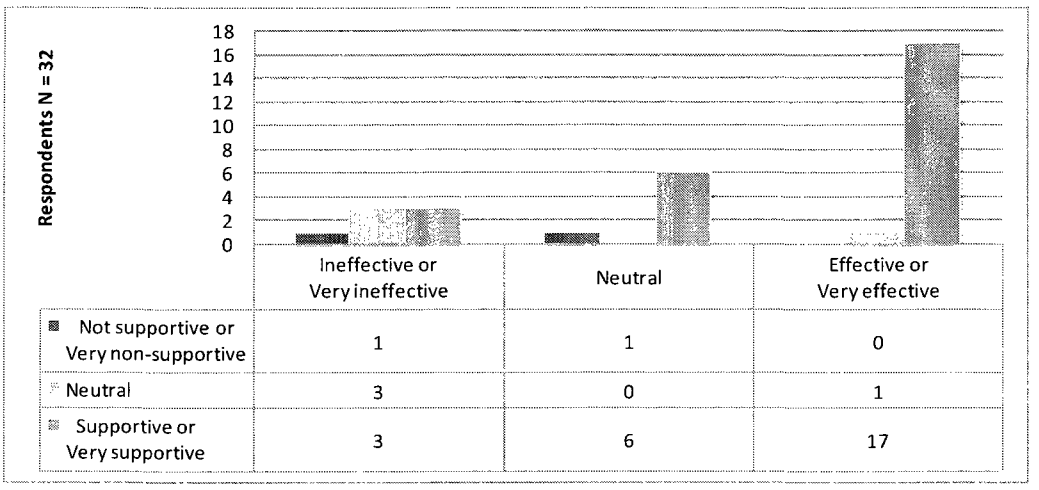


Figure 83: Perceived organizational support in last experience

The perception of organizational support was associated with the level of effectiveness rating for personas, but not significantly with such a small sample, χ^2 (12, $N = 32$) = 17.34, $p = .137$, see Figure 84. Effective or highly effective ratings were more likely to come from respondents who also identified a high level of organizational support.



	Ineffective or Very ineffective	Neutral	Effective or Very effective
Not supportive or Very non-supportive	1	1	0
Neutral	3	0	1
Supportive or Very supportive	3	6	17

Figure 84: Association between effectiveness and organizational support: Personas

8.2.3.5: Last experience and interrelationships with designer profile variables

To complete the analysis, I looked for associations among other variables and how respondents rated their last experience in an attempt to understand what might predict a higher effectiveness rating. There were no significant associations between how respondents rated their last experiences and any of the designer-related moderator variables.

8.2.3.6: Last persona experience summary for follow up survey respondents

The set of questions which asked about respondents' last experience with personas provided insight into how personas are perceived by a wide range of UX professionals. For a majority of the analysis, I contrasted findings between UX Centric and Designer job title responders.

When asked to describe their last experience with personas, Designers were more likely to focus on presentation modes than respondents from UX Centric job titles. This is likely due to the fact that Designers interact with the presentations as users. (Designers were more likely than UX Centric job title responders to have identified themselves as 'users' of personas and scenarios created by someone else).

Most respondents rated their last experience with personas between the neutral and effective levels. More than half (63%) of Designers had a favorable opinion

compared to 51% of UX Centric responders. Personas were thought to be effective by all job title types because they: (1) increased communication which helped decision making among design teams; (2) they were based on good research; and (3) they helped design teams focus by depicting goals and usage patterns. Personas were ineffective when: (1) design teams did not know how to integrate them into the design and development process; (2) there was a lack of company support; and (3) the research used to create the personas was perceived as lacking in some way (i.e. too small of sample size or not actually based in research).

The claims of communication and focus were somewhat supported. Evidence to support many of the criticisms and concerns was also found in the responses including: (a) personas were not believable due to insufficient data; (b) personas overly abstract end users; (c) designers need training to understand how to use personas; and (d) personas require the specialized skill of social scientists. An additional criticism was also evident, that personas do not contain the right type of content to adequately support design (i.e. not useful and therefore not used).

Regarding the perception related variables discussed in Chapter 3, responses provided evidence to support the importance that the UX research be perceived as rigorous. Presentation modes were a salient concern for many Designers. Finally, the exogenous variable of organizational support was also mentioned by two different responders.

Designers reported that they found personas were more useful when they included: (1) product/ service related information; (2) general technical information; and (3) demographics. Personas were less useful when they included: (1) non-product/service related information; and (2) demographics and fact sheets. The fact that demographics were in both categories indicates that some Designers have found them important, while others found demographics extraneous.

Finally, there were no significant associations between levels of perceived effectiveness of the personas in the last experience and any of the Designer-related

moderator variables that were identified in Chapter 3. Only organizational support appeared to be associated with how UX professionals perceived the effectiveness of personas. This suggested that for UX professionals to successfully use personas, it is very important to get buy in and support from the organization.

8.3: Best and worst experiences

Survey responders and study participants with multiple persona experiences were asked to describe their best and worst experiences. The next sections describe the data analysis procedures that I used to code the responses (section 8.3.1), the findings from study participants (section 8.3.2) and the findings from survey participants (section 8.3.3).

8.3.1: Data analysis procedures

Among the design study participants, best and worst experiences were only asked of Marco and Maria.[67] Maria had multiple experiences using personas and Marco had multiple experiences using both personas and context scenarios. While all follow-up survey respondents had claimed exposure to personas in the screening survey, many responders did not have multiple experiences; as such, there was a reduced number of respondents for this question. Answers were coded for indication of persona claims, criticisms, and unsolicited references to perception-related variables and/or any of the exogenous variables.

8.3.2: Findings: design study participants

In the next sections, I present the discussion with Marco (section 8.3.2.1) and Maria (section 8.3.2.2) pertaining to their best and worst experiences.

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[67] While Leanne claimed to have three experiences using personas she could only remember two experiences and one of those was in the classroom; as such, I did not feel that she had the level of experience required to make comparisons among best and worst experiences.

8.3.2.1: Marco (Experience level 6 of 10: medium group).

Marco, who had the most professional experience using personas and context scenarios, reported having a very good experience about four years ago. He stated his reason for the good experience was due to high organizational support which enabled an extensive presentation. He also implied that the personas were memorable and supported increased communication about end users.

Cynthia	Okay. So, what has been your absolute best experience in using personas?
Marco	I think the good thing about them is it helps people as a whole…the whole team that's building a product.
Cynthia	...Set up how they were presented to you, what the project was.
Marco	There was a really good…almost like a campaign for these personas. ...There were posters everywhere; the business administrator, the house mom, the young kid, ...kind of like advertising really…these personas, who these people were. And we still hear their names today. People still identify personas with those names.

For Marco's worst experience he referred back to the instance in which a group of coworkers (engineers) were creating and using personas to justify features. Again, this was evidence for the stereotype confirmation criticism. At the end of this exchange he also focuses on the importance of research rigor (i.e perception-related variable):

Cynthia	So, tell me about your worst experience with personas.
Marco	I think in that earlier example where people were kind of creating them to justify their features as a way to basically block any changes. They would say something like: "well, our engineering persona that we created, wouldn't want any changes to our UI, so you can't really tell us what to do." …And it's, kind of …you didn't create that persona with researchers. ...To get that suspect feeling that they didn't really put the time into creating these personas properly. Then it just becomes a misuse.

Cynthia Okay. So, when you say, 'didn't create them properly', what do you think is the proper way?

Marco I think that once you identify an age group, or occupation, or whatever, I think that involves a lot of finding, surveying those types of people and trying to gather as much information from them as possible. And then maybe trying to figure out all the correlations or all the, you know, common themes that come up.

8.3.2.2: Maria (Experience level 7 of 10: medium group)

In Maria's best experience, she, like Marco, stressed organizational support which enabled an effective presentation of the personas. She also spoke of an organization structure that really helped to facilitate persona effectiveness in this exchange:

Cynthia Tell me about your best experience ever.

Maria With the first time I've dealt with personas. And it was a really …I got my start at this place in Los Angeles where they really valued interaction design.
...At the time. They may have a different culture right now. I don't know. But it was really unique, because there were three types of people under the user experience design umbrella: the visual designers, the interaction designers, and the usability researchers.
...Three disciplines reported to a single director. Now, if you have, a director for the visual designers and a director for the interaction designers, there could be conflict. So, you know, there was a single director who believed in usability, and the usability researchers did the personas. They actually interviewed people and created these even more attractive persona posters and informed everybody in the company through PowerPoint presentations and informing everybody about these personas having posters up.
...So, after that experience, everything else seemed to be sort of like a letdown.

In this last exchange Maria concentrated on her perception of the importance of the credibility of the research team.

Cynthia And, you believed in the validity...because?

Maria Yeah. I mean, like, these people were, like, the actual masters or PhD in psychology or human factors creating these personas. It seems more valid than somebody like me.
...And, in fact, an interaction designer creating personas is a more valid documentation than a project manager who just has, like, a business degree, or a programmer. I'm just talking.
...Yeah. And, also the culture supported it.

Maria's worst experience was one in which she was asked to help create the personas. She described a situation in which the organization gave lip service to supporting personas but did not employ rigorous methods to create them. In her re-telling of the experience, she suggested that the personas were not believable because they were not associated with research data.

Maria ... we just did it within a few hours.

Cynthia You say "we" so who was involved in that?

Maria Oh. Yeah. It was myself and another designer. Within a few hours, half a day, to create these four or five personas.
...And, then, that was it. It's like... a checklist with fifteen personas. Okay, move on to the next step, and the next step. And we didn't look back at those personas. So that was kind of like a lame exercise.

Cynthia Okay. And who asked you to do that exercise?

Maria It's part of the process they laid out. So, you know, kickoff may be the first item on the checklist. Second item, looking at the competition. Third, personas. Fourth, wireframes. Fifth, mockups.

Cynthia All right. So, in that case, you cranked them out, you did them, and you never looked back...because you didn't find them valid?

Maria Nobody did.
...It didn't influence the requirements, and I think that's key for personas; that it would influence the requirements.

In sum, Marco and Maria's best experiences were associated with a high level of organizational support and a clear presentation. The perception of rigorous research was important to both participants. Maria additionally spoke of the perception of the research team indicating that she was more persuaded if the persona creators were trained researchers.

The good outcomes of the best experiences supported the claims of communication and focus on specific users. The bad outcomes of the worst experiences were: (a) the personas were not believable and therefore not persuasive; and (b) the method led to stereotype confirmation.

8.3.3: Findings: follow up survey responders

All survey respondents were asked an open ended question to describe their best experience with personas; however, not all respondents had more than one experience. Answers were coded for indication of persona claims, criticisms, and references to perception-related variables or any of the exogenous independent variables. Responses about the best persona experiences (section 8.3.3.1) followed by the worst persona experiences (section 8.3.3.2) are presented in the next section.

8.3.3.1: Best experiences.

Again, I juxtaposed the responses from the Designer job title responders with those from the UX Centric job titles followed by a summary.

8.3.3.1a: Designer job titles (N = 16, coded N = 13). Of the 13 Designer respondents who answered this question, the content of nine responses either supported persona beneficial claims or referenced the presentation. The remaining four were simply general positive comments, for example, Respondent 127 wrote that the use of personas was "*always a positive experience.*" As with the design study participant session findings, the claims of focus and communication were often intertwined.

The claim of focus was evident in six responses:

- "Personas were largely developed before I had come into a project.... I had noticed that medium sized organizations have been the best at

creating them and providing exact profiles for precise portions of their apps," Respondent 070

- "Projects involving deliverables to developer audience, personas described developers of different levels, like beginner through advanced, and also differentiated across working environment," *(sic)* Respondent 019

- "I love creating personas because your imagination comes into play. It's like making sure that you invite everyone to the party, all age groups, demographic, etc," Respondent 079.

Three of the six responses that provided evidence for focus, also implied increased communication as a benefit of persona use.

- In Respondent 094's best experience, there are indications of both increased focus and communication; greater communication in turn aided decision making:
    - "The team had broad knowledge of the customers from a lot of previous experience. We were able to narrow down from a matrix of about 9-10 different flavors of customers to three targets. It helped us focus on the design goals of simplifying the first experience, vs. a flexible variety of tools for 'everyone' to use as they saw fit. This made ease-of-use design features more prominent in the development vs. standard additional functionality."

- Respondent 040's submission also implied support for increased focus and communication; communication was inferred because the respondent used 'we' to discuss identifying a target:
    - "When targeting a certain persona, we were really able to identify what was missing from the market for that group. As a result, we were able to identify a niche we could improve, and have had some great response from the related community regarding our product."

- Finally, while Respondent 178's response is not well written, both increased focus and communication are inferred:
    - "We finalized that we will focus on identifying the persona background and then try to define persona in that framework. It turned out that defining this framework was the best thing that we did as it saved us a lot of time and effort defining persona," *(sic)*.

Additionally, Respondent 009 inferred an increase of communication (but not focus) when he wrote that personas were:

- "A reasonable way to discuss feature requirements among the various disciples designing the feature."

Finally, Respondent 007's submission concentrated on the presentation of the personas (as posters) and how the personas helped with both communication and avoided ill-informed assumptions and stereotypes:

- "My first experience involving personas was a poster providing three radically different users of our programming software. Because this was a product that we developers used in our daily jobs, we had always assumed we were the target audience. This poster concisely, entertainingly, and memorably confronted that assumption and turned it on its head. That one poster had a direct and huge impact on the entire direction of the design of programming tools within the company. Those same personas have been continuously used, with few changes, for over 15 years."

8.3.3.1b: UX Centric job titles (N = 16, coded N = 16). Of the 16 submissions from UX Centric responders, 11 responders referred to at least one of the persona beneficial claims. Of the remaining five submissions, three were positive and two claimed to have no good experiences using personas:

- "I haven't had any great experiences with using personas," Respondent 189.

In a similar vein, Respondent 101 wrote:

- "I really can't think of a "best" experience. My team has a lot of good intentions around personas, but it has been difficult to follow-through on them. We have multiple sets of personas, but they get very little use."

In Respondent 095's submission the utility of personas was questioned while support for communication was implied:

- "The team was very involved and together we developed a good set of personas that had buy-in from most of the team. Unfortunately, then the goals changed and I'm not sure they were used."

Communication was also implied in these two responses:

- "Short lightweight personas for a business extranet that were able to serve as reference throughout the project as a means to baseline later design decisions," Respondent 083

- "The project was for a rebate tracking system. The developers were collaborative team members. We all worked for the common goal of a usable system. I was considered part of the development team," Respondent 093.

Both communication and focus were apparent in Respondent 121's submission:

- "The Fashion phone for women was my best experience. Although some of the execs thought it was a waste of time, it definitely helped the team focus on two people - the primary and secondary personas and allowed them to guide the design decisions."

Respondent 048 suggested that the personas needed to be believable to support communication when she wrote that:

- "This last experience was the best because the stakeholders believed the personas and felt comfortable talking about their needs."

Five submissions supported the claim of clearer focus:

- "Have been most useful to me personally in my work. I can call them to mind immediately when evaluating a design suggestion or idea," Respondent 076

- Seeing sales conversions on an ecommerce page, that was written carefully using persona-based language/taxonomy, soar," Respondent 104

- "Where we could interview the appropriate number of people, and were free to create the persona types based off of the research and not what the client wanted; and the end result was built into the ongoing prioritization of new features based on the high value personas," Respondent 082 (who also concentrated on the process involving persona creation suggesting that a adequate sample size was related to a good persona experience).

- Worked for a client who had a problem converting site visitors to sales. We did an extensive amount of research with their customers and potential customers. From broad groups ....we found 3 common needs. We created personas based around those needs and these personas drove the site redesign. Once the site launched, their conversion numbers nearly tripled. It was brilliant. A kind of situation where it all worked perfectly," Respondent 081.

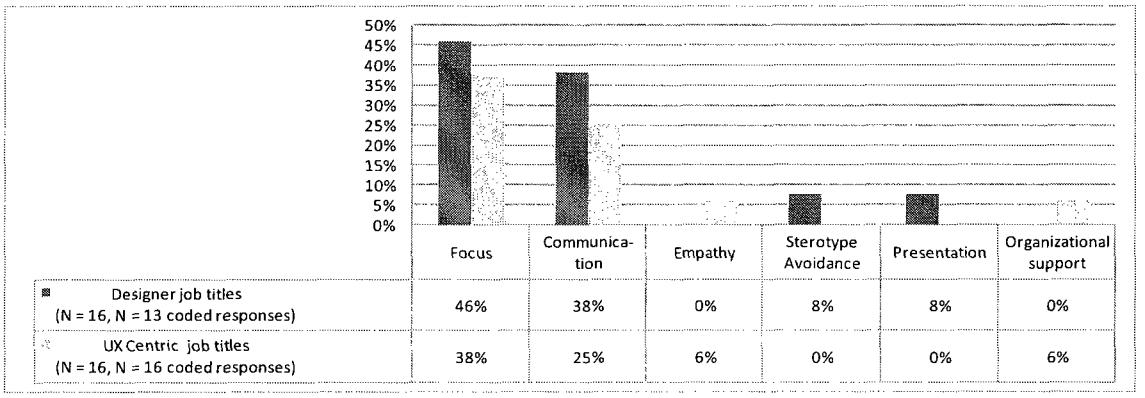
- "I helped put together three personas for the website launch for a big company in the area. They were totally on board with the personas, and we created paths through the site based on scenarios tied to the personas. As a design tool, they were excellent at focusing attention on the right details," Respondent 089 (who also discussed organizational support and the addition of scenarios in his best experience).

Finally, the claim of increased empathy was also evident among the best experience responses. Respondent 084 reflected on how summarizations of research were helpful and facilitated greater empathy with end users when she wrote:

- "Best experience is when you see how the research findings become meaningful and impactful for clients or those who weren't directly involved in conducting or observing research. You can see how they "get it" when pain points, contexts, and motivations are packaged in a human story."

8.3.3.1c: Summary: best persona experiences. In sum, most respondents reported a positive best experience. Most (81%) of Designer respondents reported a positive best experience (the remaining did not complete the question). Similarly, most (87%) of UX Centric responders reported a positive best experience while 13%

claimed to never have had a positive experience. The claims of focus and communication were evident in many answers, see Figure 85. Claims of empathy and stereotype avoidance were each evident in one submission. One Designer respondent focused on the impact of the presentation (as posters) and one UX Centric responder focused on the importance of organizational support.



	Focus	Communica-tion	Empathy	Sterotype Avoidance	Presentation	Organizational support
Designer job titles (N = 16, N = 13 coded responses)	46%	38%	0%	8%	8%	0%
UX Centric job titles (N = 16, N = 16 coded responses)	38%	25%	6%	0%	0%	6%

Figure 85: Best experience - Personas

8.3.3.2: Worst persona experiences

I contrasted the responses from the Designer job title responders with those from the UX Centric job titles in the following sections, followed by a summary.

8.3.3.2a: Designer job titles (N = 16, coded N = 9). Of the nine Designer respondents who answered this question, the content of four responses reflected criticisms found in the literature. Three of the responses claimed that they had no negative experiences to report, three responses suggested that the personas were just not useful or used, one respondent reported a lack of good presentation, and one respondent reported a lack of organizational support due to tight timelines as the critical factor leading to the worst experience. Finally, one responder did not have a negative worst experience to report, but suggested the persona method was not viewed favorably, "nothing really, but for some reason it fell out of favor," (Respondent 009).

Four responses reflected criticisms found in the literature. Three responses were coded as supporting the non-believable criticism:

- Respondent 077 wrote that his worst experience was when he was presented a persona that he described as:
    - "Some bozo just made *(it)* up and it had about as general facts as you could imagine."

- Respondent 178 suggested that personas were more based on opinions than research when he wrote:
    - "There were so many opinions about designing personas. The team member tried to define persona which were pretty much like there own profile rather than focusing on the project topic."

- A lack of good presentation, and unbelievability due to small sample size as leading to the worst experience was suggested by Respondent 007 when he wrote:
    - "The only bad experiences I've had with personas have been when they are implicit (not explicitly or concisely communicated) and based on one or two individual experiences. In short, my experience with personas is bad when they are non-existent or inaccurate."

One response was coded for the 'overused and stale' criticism of personas found in the literature. Respondent 070 wrote of her last experience:

- "This was definitely the last assignment where the app was so large that they had developed these sort of "over arching" personas that they expected to be repurposed throughout the app. The app was also old so that most of user research (sic) was not able to provide much guidance."

Three respondents simply reported that the personas were not useful or used:

- "At my last company, we spent so much time on personas, which were long forgotten once we got to the design stage," Respondent 079.

- "While (the personas) provided loads of statistical and demographic data for a segment we were targeting, there was not much correlation among samples. Thus, it was difficult to interpolate what product features would be most beneficial," Respondent 040.

- "A study involving [product name] and personas that did not clarify the responsibilities of the model users led us down a bunch of irrelevant paths and was a waste of time," Respondent 184.

Lastly, the lack of organizational support tied to a tight timeline was key to the worst experience reported by Respondent 019 when he wrote:

- "The bad side of the experience had more to do w/ company support of using personas...(it was a) typical software environment where everyone wanted to jump immediately to 'doing real work' with no time to fully define personas and/or target audience."

8.3.3.2b: UX Centric job titles (N = 16, coded N = 15). Of the 15 responders with UX Centric job titles that answered this question, six provided responses that reflected common criticisms found in the literature. Five responses discussed how the personas were either not useful or not used.

The remaining four submissions included other various reasons for the worst experiences:

- Respondent 121 wrote of too many personas
    - "Once I worked on a project where there were eight personas; too many for one product and doesn't really help focus anything."
- Respondent 050 suggested that the personas were misused by a program manager:
    - "Having a program manager dismiss a general usability concern because it wasn't important to the persona."
- Respondent 189 reflects a change of organizational support as leading to the worst experience:
    - "...the worst is when the GM of the product group decided he didn't want to design to the personas...in other words, his priorities had changed and we weren't aware of this until the morning of the presentation."

- Respondent 048 suggests that previous bad experiences led to her worst experience:
    - "I tried to integrate data-driven personas to developers but they were very resistant because of a negative experience from marketing colleagues in the past."

The most common reason given for worst experiences had to do with personas being unbelievable ($N = 5$); however the source of the unbelievable nature was varied. These responses included:

- Unbelievable personas due to insufficient research and stereotype confirmation were implied by Respondent 069 when she submitted:
    - "My worst experience was for an Enterprise Mobile Application project. There was no clear direction on the product goal /vision - so the team ended up working on personas that aligned to the executives in the company. So in affect it wasn't design around personas, it was more of lack-of-direction equals executive personas to give the product direction."

- Several reasons were given in Respondent 084's story about her worst experience in which unbelievable personas were the result. Reasons included small sample size, limited time and budget, stereotype confirmation, and creating too many personas:
    - "The first project I worked on with personas we had an extremely limited number of research participants due to budget and timing, and we resorted to talking with family members and filling in some of the details based on our own contexts and assumptions. We created personas that were too high fidelity for the research input that we had. We also created too many, because we felt pressured to define all of the major audiences for the website. This made using them to guide priorities and decisions for the design challenging - we created problems for ourselves with poorly defined personas."

- Unbelievable personas were also the result in Respondent 101's response, but this time due to the type of research (quantitative versus qualitative) that was used:

  - "We created personas for trans-actors based solely on survey research. We made up the personal details. Although we spent a great deal of time looking for patterns in the survey results and re-writing the personas, I was never too confident in the original research. We also didn't really use them in the design process, which added more questions about their value."

- Respondent 082 suggested that small sample size led to unbelievable personas when he wrote:
  - "We could only interview a few people and we only were able to create assumptive personas that were of limited value."

- Finally, Respondent 095's submission suggested that the personas were based on "*little data*" and consequently it was difficult to reach consensus about the personas because "*a very large team of people needed to sign off.*"

One other common criticism of personas, that designers need training to benefit from personas, was evident in Respondent 076's report of her worst experience:

- "Personas to the team on a conference call and having absolutely no response or feedback, positive or negative. Just silence. I suspect people really didn't know what to make of them and found them a little silly."

The remaining worst experience stories ($N = 4$) either described an experience in which the personas were not useful to design or were not used; however, there were no reasons given, or the reasons were not related to a criticism found in the literature.

- In the first category (not useful), Respondent 093 wrote that her worst experience was working with developers who were resistant to UX research implying a poor organizational structure:
  - The most recent project where the developers were all full-time and I was contracted for 20% time. There were seven developers and they considered anything to do with usability, user experience or design an unnecessary element."

- Respondent 089 also found personas not useful in this experience:

  - "My worst experience is when a client handed personas to me. They weren't personas, but were rather demographic sketches. They had little meaning, and I couldn't use them."

- In the second category (not used), Respondent 081 suggested any time personas were not used was a worst experience:
  - "Any project where you created personas only to have them shelved and not used to guide later design decisions."
- Finally, Respondent 004 described a difficult work environment leading to the futility of persona use:
  - "Frequently training (sometimes haranguing) other staffers on our personas and seeing that information ignored when they created web pages, content, etc that would not appeal to the persona. For example, we knew the word "sales" was abhorrent to our main persona, yet many writers would continually put that word in headlines."

8.3.3.2c: Summary: worst persona experiences. In sum, most respondents also reported a negative worst experience. More than half (56%) of Designers reported a worst experience while 88% of UX Centric responders also reported a worst experience. The most common reasons for worst experiences included: (a) non-believability due to insufficient research, links to the research, or a small sample size; (b) those bad experiences linked to exogenous independent variables of organizational support, timelines and budgets; and (c) generalized descriptions of personas being not useful or not used after they were created, see Figure 86. Other less cited reasons are shown in Figure 87.

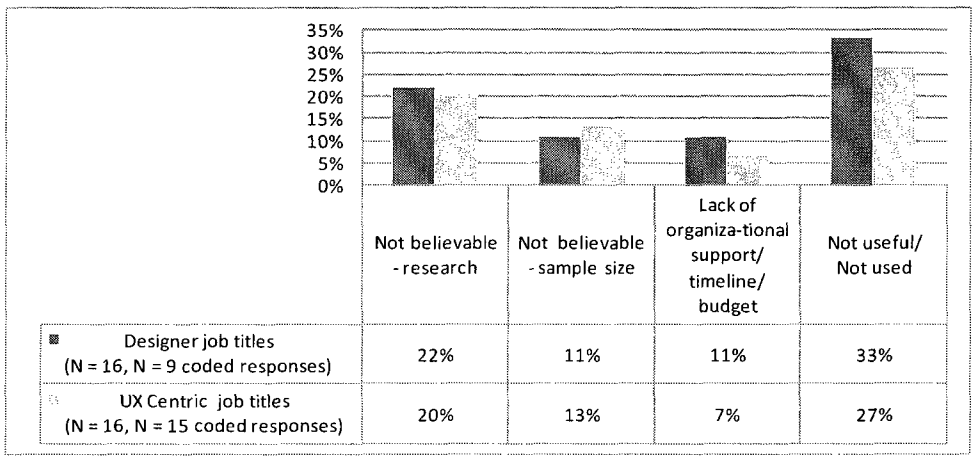


Figure 86: Worst experiences personas - most common reasons

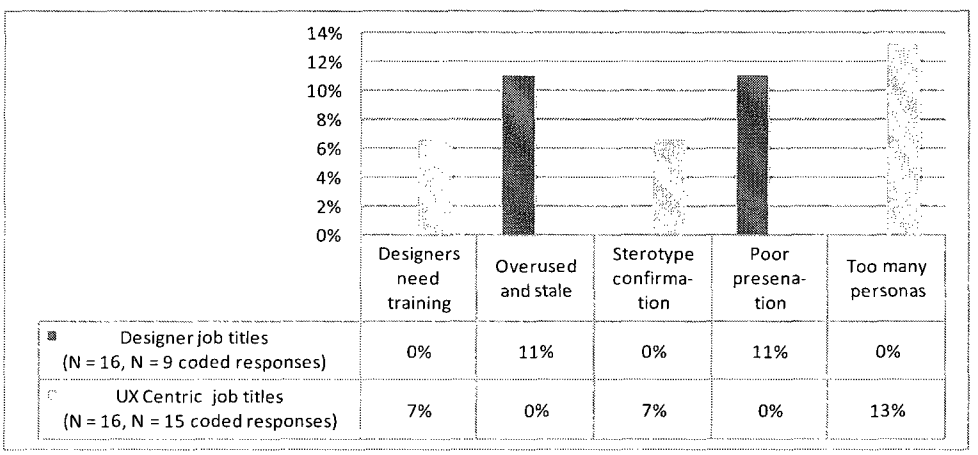


Figure 87: Worst experiences personas - other reasons

8.4: Summary: Past experiences

This chapter explored past experiences with personas for study participants and survey responders. Additionally, it presented past experiences for Marco in which context scenarios were used. I contrasted findings from participants and survey responders with Designer job titles to survey responders with UX Centric job titles. I presented perceptions and opinions held by UX Centric professionals to help understand how the groups differ. However, data from UX Centric responders does not help to answer the two primary research questions of this dissertation which ask: (1) are personas and (context) scenarios perceived as usable, useful and effective

translations/conduits of user research by Designers (presented in section 8.4.1); and (2) what should UX researchers strive to understand about Designers to maximize the effectiveness of personas and context scenarios? (The latter question is explored in section 8.4.2).

8.4.1: Are personas and (context) scenarios perceived as effective?

To help answer the first question, I analyzed answers for indications of the beneficial claims and criticism as well as relying on how survey respondents rated the success of their last experience. For personas, I analyzed input from 16 Designer survey responders and five study participants who all claimed to have at least one experience with personas ($N = 21$). I used only the input from Marco for reflection about context scenarios. There were three questions in which claims and criticisms were identified: (1) the first three things that came to mind; (2) discussion about the last experience; and (3) description of the best and worst experiences. In the next sections, I discuss how outcomes were discussed in the previous experience questions which included: (1) beneficial claims (section 8.4.1.1); (2) concerns and criticisms (section 8.4.1.2); and (3) perceived success (section 8.4.1.3).

8.4.1.1: Claims

The claim that personas help Designers achieve a clearer focus of the end users was well supported in the open-ended discussion about last experiences. Thirteen (81%) of the sixteen Designer survey responders and three of the five study participants inferred that personas help them focus on a subset of users in at least one of three discussions: (1) name the first three things that come to mind; (2) describe your last experience; and (3) describe your best experience. Marco also suggested that context scenarios helped personas meet the focus claim when he discussed the 'first three things' that came to mind about scenarios.

Personas facilitating better communication was somewhat supported in survey responder discussion about past experiences. Five (31%) of the sixteen Designer

survey responders suggested that personas helped members of the design team discuss users; in two submissions, the responders also suggested that greater communication, in turn, helped with decision making among the design team members. There was also evidence from one Designer respondent that personas inhibited communication by confusing design team members during brainstorming sessions.

Personas facilitating increased empathy with end users were not well supported in the past experience discussion. It was evident in one, Respondent 079, description of her last experience when she wrote that personas helped, "*get a better feel for what they needed on the website, their pain points*." Empathy was also evident in two study participant's discussion (Leanne and Lucy).

The claim that personas help Designers avoid stereotypes and correct ill-informed assumptions was also not well supported. One survey respondent (Respondent 007) suggested that personas helped him avoid stereotypes when recounting his best experience, when he wrote:

- "Because this was a product that we developers used in our daily jobs, we had always assumed we were the target audience. This poster concisely, entertainingly, and memorably confronted that assumption and turned it on its head."

While Lucy did not create personas as defined by the literature, her description of conveying the difficulties that her family was having interacting with the technology that her company was creating was an attempt to help her team members overcome their assumptions and stereotypes about the end user audience.

The claim that context scenarios add cultural context was not evident in Marco's discussion about using context scenarios in the past. However, Marco suggested that context scenarios "*help us get away from certain assumptions we might have*" indicating support for the claim of stereotype avoidance. Additionally, focus, and the importance of perceiving research as rigorous are evident in Marco's 'first three things' context scenario definition.

In all, thirteen (81%) of Designer survey responders and three of the five study participants provided evidence in their past experience discussions that supported at least one of the beneficial claims of personas.

8.4.1.2: Criticisms and concerns

There was scattered evidence in responder and study participant discussion of most of the criticisms and concerns found in the literature. There was also evidence in the Designer discussion of an additional generalized concern that personas are created and then not used or were just generally not useful.

The most common criticism is a lack of believability due to insufficient research or ties to the data. Five (31%) of the sixteen survey responders and two of the five study participants (Marco and Maria) voiced this concern when discussing past experiences with personas. Since this is related to the perception of research, I also discuss this in greater detail in the section on perception related variables below.

Over abstraction was a concern voiced by Lucy and one Designer survey respondent. In Lucy's case, she expressed concern that the Kyrgyz personas were "*fake*" because they were not actual individuals. Survey Respondent 184 suggested that the personas she was presented in her last experience were "*limited in that they only reflected one axis of the user complexity.*"

Stereotype confirmation was evident in Marco's discussion about his last (and worst) experience. There were two examples of stereotype confirmation in his discussion: (1) he conveyed a story of how the method was used by engineers in his company to create personas to justify features; and (2) how personas were reduced to more simple frameworks (i.e. house mum) that permitted design team members to make assumptions about the personas.

Survey Respondent 019 discussed the concern that persona creation required the special skills of a social scientist. In this case, the concern was interrelated with the perception that the composition of the research team was an important consideration for the Respondent when he wrote:

- "Effectiveness was closely related to the experience of the person (researcher I guess) that produced the persona. They are not easy to create..."

I expanded the concern that personas can become overused and stale to include a concern that personas also did not represent the user audience because they were borrowed from or created for another purpose. This concern was expressed by two survey responders. When describing her worst experience Respondent 070 discusses repurposing of personas when she wrote:

- "They had developed these sort of "over arching" personas that they expected to be repurposed throughout the app. The app was also old so that most of user research (sic) was not able to provide much guidance."

Respondent 071 suggested that the personas he was given were not effective because:

- "They were not targeted at our specific software product, but instead were more about the general airline mechanic community."

Leanne's story of being presented personas representing the retailer's in-store customers when she was involved with the development of an online store was a similar concern.

Finally, a generalized concern that personas were created but then not used was evident in Respondent 079's submission when she wrote:

- "In all of my experiences, the personas were well-thought, but never referred back to."

In a related concern Respondent 184 expressed a generalized concern that the personas did not meet any of their claims, and instead were a waste of time when she wrote of her worst experience of a study:

- "Involving [product name] and personas that did not clarify the responsibilities of the model users led us down a bunch of irrelevant paths and was a waste of time."

In all, ten (63%) survey respondents and four of the five design study participants included at least one concern or criticism in their discussion of the past experiences using personas.

8.4.1.3: Perceived Success

When explicitly asked to rate personas, the Designer survey respondents were somewhat enthusiastic, giving personas an overall rating slightly below effective (M = 3.63, SD = .86). Three major reasons given for personas effectiveness were: (1) personas facilitated increased communication which helped decision making among design teams; (2) personas were based on good research; and (3) personas helped design teams focus by depicting goals and usage patterns. Three major reasons given for persona ineffectiveness were: (1) design teams do not know how to integrate into the design and development process; (2) a lack of company support; and (3) the research used to create the personas was perceived as lacking in some way.

8.4.1.4: Summary: Are personas and (context) scenarios perceived as effective?

Based on evidence presented here, personas are generally perceived as effective communication conduits/summarizations of research data by UX professionals with Designer job titles. Based solely on Marco's experience, context scenarios were also effective adjuncts to personas and helped support the claims of focus and avoiding ill-informed assumptions/stereotypes. In the list below, I combined study participants and survey responders for a total of 21 informants for past persona experiences. Past experience discussion revealed findings that included:

- The focus and communication claims appear to be well supported; claims of stereotype avoidance and increased empathy are less supported:
    - Sixteen (76%) informants provided evidence to support the focus claim
    - Five (24%) informants provided reflection that supported the communication claim
    - Three (14%) informants discussion supported the empathy claim

  - Three (14%) informants provided some evidence that personas help Designer avoid stereotypes and correct ill-informed assumptions.
- There is a great deal of concern about the credibility of the research used in creating personas which undermines their validity for some Designers; however, other criticisms were not as prevalent:
  - Seven (33%) informants discussed how personas were not believable due to insufficient data or data relationships
  - Three (14%) informants reflected how personas that they were given were either overused or were created for a different purpose and were therefore not helpful
  - Two (10%) informants suggested that personas overly abstracted end users
  - One (5%) (Marco) informant provided evidence that personas confirm stereotypes rather than avoid them.

I found some support for most of the criticisms and concerns[68] suggesting that understanding what matters to Designers and addressing their concerns is a key component to maximize persona (and context scenario) effectiveness which is discussed in the next section.

8.4.2: What should UX researchers strive to understand about Designers?

There are two dimensions in which analyzing past experiences helps answer what UX researchers should strive to understand about Designers. First, what are Designers' salient concerns when discussing past experiences personas and context scenarios? Second, what exactly about personas did the respondents find useful and what was extraneous in past experiences?

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[68] The only criticism that there was no evidence for in the discussion was that 'Designers need training to use personas concern'. However, this criticism was found among submissions from the UX Centric group.

To help answer this second primary research question I analyzed three questions for any unsolicited mention of perception-related variables or exogenous variables (i.e. what matters to Designers): (1) the first three things that came to mind; (2) description, success, and rating of organizational support of the last experience; and (3) description of the best and worst experiences. Additionally, survey responders were asked to describe what content they found useful in their last experience using personas. In the next sections, I summarize past experience discussion about the perception-related variables (section 8.4.2.1), the exogenous variables (section 8.4.2.2) and what personas' content was identified as useful (section 8.4.2.3). Lastly, I discuss how the profile, mind (empathy and design cognition strategy), and the HCD orientation alignment interacts with the past experience findings to expand on the Designer attribute list started in summary section of Chapter 7 (section 8.4.2.4).

8.4.2.1: Perception related variables

Open-ended questions and participant discussion were analyzed for unsolicited mention of four variables that may affect persona usefulness and persuasiveness as a believable research summarization: (1) presentation; (2) research and research methods; (3) composition of the research team; and (4) the sample size used to create the personas. The summary findings are detailed in the next sections.

8.4.2.1a: Presentation. How personas were presented was discussed by seven (44%) of the survey responders when discussing their past experiences[69] and three of the study participants. Leanne also mentioned the presentation mode of her last experience when she discussed the "*fancy greeting cards*" given to her by the retailer for whom she was working. Effective presentation was discussed by both Maria and Marco when describing their best experiences. Presentation modes mentioned by

[69] Recall that the phrasing of the last experience question on the survey encouraged responders to focus on presentation. Apart from the last experience question, presentation was discussed by three respondents.

survey responders were: (a) posters (six instances); (b) single fact sheets (three instances); and (c) website and specification documents (one instance).

Posters were considered effective presentation mediums by four responders. Respondents 077 and 007 were the only two Designer responders to give their last persona experience a 'very effective' rating discussed posters. Respondents 071 and 104 gave their last persona experiences 'effective' ratings also discussed posters as part of their last experience. Respondent 079, gave her last experience a 'neutral' rating because the personas were ignored, suggested that using posters would have improved her last experience when she wrote:

- "The experts say to plaster the personas on the walls in the area where development and design occur, but it has not been a practice where ever I've worked."

Single fact sheets were discussed by respondent 007 as part of his 'very effective' rating of his last experience and by 077 as part of his best persona experience. Respondent 104 (effective rating) claimed to have been given single fact sheets in addition to the posters.

Respondent 009, rated his last persona experience as neutral, was the only respondent to discuss other types of presentations. He submitted that the personas were presented to him in a website and in specification documents.

8.4.2.1b: Research/ research method. There are two aspects in understanding the salience of research to Designers: (1) the awareness of methods that are used to conduct the research; i.e., do methods matter? And (2) the importance of a clear link between research and personas; i.e., is the research transparent? Research transparency is related to the lack of believability criticism, in that, unbelievability is primarily due to insufficient research or insufficient ties to the data.

Five (31%) survey responders discussed research methods when asked to describe their last experiences using personas. In three cases the respondents were personally involved in helping to create the personas, and in two cases the respondents used legacy personas that were created for a previous project. Only qualitative research

methods were discussed by respondents: methods included interviews, contextual inquiry and ethnographic studies.

Four (25%) of the sixteen survey responders and two of the five study participants (Marco and Maria) discussed the perception that personas should be based on real data. Survey respondents stated that:

- "Some bozo just made *(it)* up and it had about as general facts as you could imagine." Respondent 077
- "The team member tried to define personas who were pretty much like there own profile," Respondent 178
- "Some people take more time making up irrelevant stories about the personal details that don't really apply," Respondent 094
- "The only bad experiences I've had with personas have been when....not explicitly or concisely communicated and based on one or two individual experiences," Respondent 007.

Additionally, both Marco and Maria (the two most experienced Designers with personas) stressed the importance of the perception that the research used to create the personas was rigorous.

8.4.2.1c: Research team. The importance of the credibility of the research team was evident in Respondent 019's explanation for why he gave personas an 'effective' rating for the last experience when he wrote that:

- "Effectiveness was closely related to the experience of the person (researcher I guess) that produced the persona. They are not easy to create..."

Additionally, Maria and Marco both discussed the importance of the composition of the research team. Marco claimed that if engineers were creating the personas he doubted the credibility and Maria stated that personas were more valid if created by "*actual masters or PhD in psychology or human factors*," when she discussed her worst and best experiences.

8.4.2.1d: Sample size. Respondent 040 discussed sample size when he explained why he gave personas an 'effective' rating in his last experience when he wrote that:

- "...talking directly to people we are targeting can be very helpful, but at the same time a small sample size is naturally limited in its effectiveness."

Additionally, Maria addressed sample size when she suggested that there is greater emphasis in industry for more rigorous methods when creating personas when she said, "*nowadays, people seem to want numbers behind the information.*"

8.4.2.2: Exogenous independent variables

The perception of the importance of exogenous variables is another component that might affect persona usefulness. Exogenous variables I explored were organizational support, timelines and budgets (section 8.4.2.2a-b).

8.4.2.2a: Organizational support. A high level of organizational support appeared to be important to the perceived success of personas by Designers. This conclusion is supported by: (1) the high level of association between the ratings of persona effectiveness and organizational support in the last experience; (2) lack of organizational support was cited by two survey respondents and Lucy for why personas were ineffective; and (3) high organizational support was discussed by Marco and Maria as part of their best experiences. Each of these three points is expanded below:

- Ten of the sixteen survey responders rated personas as 'effective' or 'very effective' in their last experience. Nine of those ten survey respondents rated the organization as being 'supportive' or 'very supportive'.
- Lack of organizational support was cited by two survey responders, Lucy and Maria, as important reasons for persona failure. Respondents 070 described a lack of organizational support in her last experience as

the reason she gave personas an 'ineffective' rating. Respondent 070 wrote that:

- "The organization was so large, and my PM/team didn't really believe in UX...I was the only one...it was like pulling teeth."

Similarly, Respondent 019 expressed a lack of organizational support as the key reason for his worst experience when he wrote:

- "The bad side of the experience had more to do with company support of using personas."

In Lucy's case, where she independently explored her family as end user representatives, she suggested that the information she was bringing back to the design team was largely ignored because her boss was not impressed by her findings.

- In the discussion of their best persona experiences, both Marco and Maria, focused on the high level of organizational support; both experiences were about three to four years ago. Elevated level of organizational support in both cases resulted in high level campaigns, which in turn helped Marco and Maria engage with the personas presented to them by their companies.

8.4.2.2b: Timelines and Budgets. Timelines were discussed by both Lucy and Maria. Maria combined her discussion of timelines and budgets. In Lucy's opinion, tight timeline under which her project was completed was partially to blame for why the organization did not conduct a more thorough user investigation. Maria linked tight timelines and reduced budgets as introducing constraints which resulted in the creation of personas without user research. Maria, consequently, did not consider the personas reliable or valid and did not use them to guide her work.

8.4.2.3: Useful and extraneous content

I also specifically asked Designers what they found useful and what they found extraneous in their last experience. Designers reported that they found personas were

more useful when they included: (1) product/service related information; (2) general technical information; and (3) demographics. Personas were less useful when they included: (1) non- product/service related information and (2) demographics and fact sheets. The fact that demographics are in both categories indicates that some Designers have found demographics important while others felt they were extraneous.

8.4.2.4: Summary: What should UX researchers strive to understand about Designers?

In order to maximize the effectiveness of any research summarization, including personas and context scenarios, UX researchers need to understand their audience and the variance within the audience. Findings about past experiences using personas (and context scenarios in the case of Marco), informed this understanding by indicating first what was salient in Designer discussion by coding for unsolicited mention of perception-related variables. However, to understand how variance within the Designer audience is associated with perceptions and successful outcomes of personas requires looking for patterns between outcomes (dependent variables) and Designer attributes. In the next two sections, I discuss what was salient to Designers (section 8.4.2.4a) followed by an attempt to link what was salient to Designers' attributes resulting in a tentative list of attributes (section 8.4.2.4a) discussed in the summary section of Chapter 7.

8.4.2.4a: What is salient to Designers? In the list below I combined study participants and survey responders for a total of 21 informants for past persona experiences. Discussion about past experiences revealed unsolicited mention of several perception-related variables:

- *Presentation.* Ten (48%) informants discussed presentation as important; however, this may be an inflated number because the last experience question included a reference to presentation in the screening survey. Both posters and one page fact sheets appear to be memorable and linked to effective ratings.
- *Research methods.* Five (24%) informants discussed research methods.

- *Research rigor.* Six (29%) expressed that the perception of rigorous research is important. For those who find it important, a lack of rigorous research undermines persona (and context scenario) credibility.
- *Research team.* Three (14%) informants brought up the composition of the research team in their discussion.
- *Sample size.* Two (10%) informants mentioned sample size;
- *Organizational support.* Organizational support was an important component of perceived persona effectiveness but did not guarantee a highly rated last experience:
    - Three (14%) informants brought up that a lack of organizational support was associated with bad outcomes.
    - Two (10%) informants suggested that a high level of support was associated with good outcomes.
    - One (5%) informant (Leanne) discussed organizational support but did not associate it with a positive or negative outcome.
- *Timelines and budgets.* Two (10%) informants reflected on a negative past experience that was related to tight timelines and budgets.

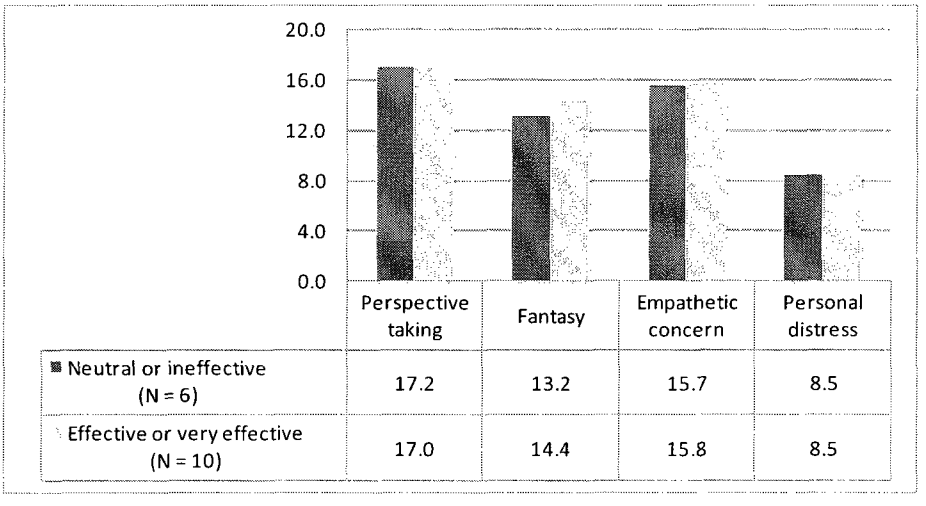
8.4.2.4b: Designers' attributes continued. Designers' attributes in which there were patterns with past experience include the following findings:

- *Profile variables.* There were no patterns in the data for job title, or age; however, professional experience and gender appear to be related to some of the findings.
    - More experienced professionals (with over five years experience) were more likely to have: (a) indicated that organizational support was 'supportive' or 'very supportive' in their last experience compared to younger designers; this finding is significant, χ^2 (6, N = 16) = 18.93, $p <$ .05, and (b) focused on the importance of organizational support in their discussions, χ^2 (4, N = 21) = 8.89, $p <$ .05. This may be due in part to

the fact that more experienced designers have encountered more situations in which organizational support was a salient factor simply because they have more overall experience.

- Males were more likely to focus on the salience of presentation; 58% of males versus 33% of females provided an unsolicited mention of presentation.

- *Empathy dimensions.* Designer survey responders who rated their last experience using personas as effective or higher had about the same empathetic scores as those who rated their last experience as neutral or below in all empathetic dimensions except fantasy dimension, see Figure 88. The pattern provides some support that the fantasy dimension may be associated with the ability to engage with a fictional persona character. Recall that in the design study, I found that stereotype confirmation was observed in the three participants with the lowest fantasy scores. There were no other patterns found among the empathy dimensions and past experience findings.



	Perspective taking	Fantasy	Empathetic concern	Personal distress
Neutral or ineffective (N = 6)	17.2	13.2	15.7	8.5
Effective or very effective (N = 10)	17.0	14.4	15.8	8.5

Figure 88: Empathy dimensions and effectiveness ratings

- *Design cognition strategy (self-identified).* Self-identified cognition strategy also appeared to be slightly associated with the salience of presentation; 57% of solution driven Designers ($N = 7$) focused on persona presentation in their past

experience discussions while only 17% of problem-driven strategists ($N = 6$) brought up presentation in their discussions.

- *HCD orientation: Experience with the method.* There were no patterns evident among the past experience findings and the number of projects in which informants had used personas.
- *HCD orientation alignment.* There appeared to be a pattern among informants who included an unsolicited mention of organizational support in their discussion and HCD orientation alignment scores. All six informants who independently discussed organizational support had low HCD orientation alignment scores (two or lower).[70] This finding suggests that a greater alignment to HCD principles may help negate the importance of organizational support.

8.5: Next Steps

In this chapter, I explored Designers' past experiences with personas (and context scenarios for Marco). Past experiences provided additional insight into Designers' attributes that will help UX researchers better communicate with Designers. In the next chapter, I explore variables associated with to the perception of personas and scenarios.

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[70] Recall that the HCD orientation alignment score (range 0-4) was a combination of alignment to the HCD principles outlined by Gould and Lewis added to whether (binary) the screening survey respondent mentioned users in one of two open-ended questions (job responsibilities and last experience with UX research).

Chapter 9 Results: Perception-related variables

In this chapter, I discuss findings from the explicit questions regarding perception-related variables presented in Chapter 3 (research methods and transparency of research methods, composition of the research team, presentation, sample size, and the effect of the audience distance). Perception-related variables were directly investigated to inform the second primary research question: What should UX researchers strive to understand about Designers to maximize the utility of personas and scenarios? The perception of the personas/scenarios is an important aspect to the persuasiveness of the data and therefore has power to influence whether a real designer will accept the role of the Mock Designer.

There were six sets of questions aimed at explicitly investigating the salience of perception related variables. These questions were asked of both survey responders and study participants; however, the wording of the questions differed slightly. The six question sets were: (1) an open ended query which asked what factors affect the quality of personas and/or scenarios (section 9.1); (2) questions regarding research methods (section 9.2) and research transparency (section 9.3); (3) queries as to the importance of the composition of the research team who was involved in creating the personas/scenarios (section 9.4); (4) perceptions regarding the importance of sample size (section 9.5); (5) questions pertinent to the importance of presentation modes (section 9.6); and (6) the impact that a distance audience might have on persona/scenario utility (section 9.7). I summarize findings in section 9.8, and preview the next steps in section 9.9.

9.1: Generate factors

Study participants and survey responders were asked to describe, "What factors do you think effect the quality of personas?" The next sections describe the data analysis procedures for the responses (section 9.1.1.), findings (section 9.1.2) and a

summary section which compares the Designer group to the UX Centric group (section 9.1.3).

9.1.1: Data analysis procedures

Survey respondents and study participants were asked to reflect on what types of factors they felt affected the quality of personas (or scenarios). This question was intended to investigate the perception about what factors were salient to respondents (i.e. unsolicited factors). The answers were coded for any unsolicited mention of research, research team composition, concerns about informants (sample size, sampling methods etc.), and concerns about the presentation (content, display and quality). Additionally, for the study participants, answers were coded for a mention of any perception of differences due to the distant audience. Finally, unsolicited mentions of exogenous variables (organizational support, timeline and budget) were also noted.

9.1.2: Findings

The next sections present findings from the study participants (section 9.1.2.1), the Designer survey responders (section 9.1.2.2), and the survey responders with UX Centric job titles (section 9.1.2.3). The findings section concludes with a summary in section 9.1.2.4, in which the Designers' responses are contrasted with those from the UX Centric group.

9.1.2.1: Study Participants (N = 10)

During the design study, I gestured to the personas and context scenarios on the table and asked study participants, "Can you tell me what kind of factors you think would affect the quality of documents like these?" There were a variety of responses; however, most focused on research. In the next sections (9.1.2.1a –j), I present each participant's response immediately following my question and how it was coded. I also summarized the study participant findings (section 9.1.2.1k).

9.1.2.1a: Leanne. Leanne suggested that important factors would include real data about the sample; in other words, she wanted transparency between the real sample and the personas.

Leanne	I guess maybe information about… people that were studied?
Cynthia	Okay. So, when you say information about the people whom were studied, what kind of information?
Leanne	Like actual, you know, ages, professions, demographics.

9.1.2.1b: Lucy. Lucy suggested that: (a) the use of interviews as a method; and (b) a mix of research informants was important when she stated:

Lucy	Being able to interview people from a variety of backgrounds.

9.1.2.1c: Lewis. Lewis focused on a variety of issues. He was concerned about: (a) the presentation of the data; (b) the transparency of research data; and (c) the need for supplemental information about Kyrgyzstan. I coded the last concern as a distant audience consideration.

Lewis	Well, if they weren't clearly spelled out, if they weren't clear documents, if the data wasn't sectionalized, if there wasn't background material on the data itself.
Cynthia	By background material you mean...
Lewis	This information. *(He picked up the detail sheets)*
Lewis	...So, like, yeah. This background. This was good information, background information, societal information, so that I can get a better grasp on what this data means.
Cynthia	Okay. This background information gave you more understanding of what the data means, but can you talk a little bit more about what you found useful about this background information?
Lewis	What I found useful about this background was analyzing the person, so that I could read the data more clearly. ...So, I understood that they were in Kyrgyzstan. I understood what was going on there. I understood what the structure of life in Kyrgyzstan was so that then I

could look at the data and get an understanding of what the person was talking about.

9.1.2.1d: Luke. Luke appeared to be concerned with the sample size; however, in a closer reading what I think he wanted was more personas. Recall that Luke did not have experience using personas prior and his response implied that he did not really understand that personas are meant to represent a larger group.

Luke The sample size.
...Because there are only three that I'm looking at right now, I would like to probably like to see an entire chart of just numbers dealing with a larger sample size.
...I don't need to look at just one person, I want to see what a 100 or a 1,000 people are seeing.

9.1.2.1e: Malcolm. Malcolm focused solely on presentation. He suggested that it would have been easier if the personas were presented comparatively rather than on three separate sheets:

Malcolm Any printed document relies heavily on, in effect, metadata and on emphasis.
Cynthia What do you mean by metadata?
Malcolm Well, by metadata I mean titles, . . .
...sub-titles, indexes, contents, summaries. Those kinds of things.
...It's always much easier to compare things on a single page. So, the fact that I had to spread out these three pages made it somewhat more difficult than if I saw, you know, a table where I could really compare things. Having the different channels with data, in other words, some kind of graphical representation of, you know, I'm trying to think of, like, the charts in USA Today. Although those are, kind of, overdone. But 55 relative to 110. See, Roza's husband's income is twice Shirin's income. She's a student. She has three kids. So, this is five people on $110 a month. So, this, like, I have to do math figure out what the per-capita is for these people. So, there's, you know, a lot could be done graphically, you know...

9.1.2.1f: Marco. Marco was concerned about: (a) the amount of research; (b) the validity of the research backing the personas; (c) transparency between the research and the documents; and (d) the quality of the presentation in regards to the writing:

Marco	I think the amount of research that goes into them. ...I think that the writing quality, actually, I find to be pretty important. It's really easy to create something and people just look at it and then they'd start to go, you know, like: oh, come on. That's almost ...You know, it's almost, like, too cheesy. ...It's real easy to get that impression that you made it up as opposed to, like, there's a lot of information that went into this. And it's hard to boil all that down into what's essential....
Cynthia	Okay. So, I'm hearing it's important that there's a lot of research backing up whatever the facts are in the personas?
Marco	Yeah. In case people start getting ...Because I see it as an outline. People start asking questions about, like, you know, what do you really mean by this statement? You know, is this just something that you thought of? Or is there actually a reason why, you know, you made this particular statement about this persona?

9.1.2.1g: Maria. Maria's discussion focused on: (a) research informants (sample size and the sample composition); and (b) research methods including using available databases, interviews and ethnography. She also suggested that very few companies consider UX research important and that this is a change that she has noticed over the last five years:

Maria	Since knowing that there was actual research done to get the information to create these personas...Like if you interviewed 20 people to compose these four or three personas, that's more valid than just creating something like a short story or fiction. So, interviewing actual people, getting the information from Forester or whatever, like which internet resource...
Cynthia	So, you've been using databases that are just out there.
Maria	Yes. But sometimes you get a better angle when you actually talk to people or shadow them. Like with

ethnographic research....I know most companies don't have the resource or they think that's just too crazy to do.

Cynthia Okay. And you would say that actually most companies do not have the resources, or think it's crazy, because of your personal experience?

Maria I think companies that do them, they have that reputation for doing proper ethnographic research or personas. Companies like IDEO or Cooper or Blink in Seattle, they're known for that. But other companies, you know, ...Just talking to other people ...they're not doing it. ...Or, they may have done it like five years ago, but not today.

Cynthia Okay. And do you think that's a common shift, where they did it five years ago and aren't doing it today?

Maria To justify the need for personas and ethnographic research?
...I talked to people at [company name]. I think it varies from product group to product group and who's in it. But I think it's a struggle unless you work for these companies, like Cooper, or Adaptive Path...

9.1.2.1h: Heather. Heather was concerned about: (a) the content of the presentation; and (b) potential problems caused by the unfamiliarity of the audience.

Heather I like the quotes.
...It was good to have a basic description of how each of them views their phone and how they use their phone. Because each of these had different uses that were quite different. She's closer to an American. *(Referring to Shirin).*
...So, she's very easy to understand, I think, from our cultural standpoint. I kept reading his *(indicating the Parxat scenario)* and wondering how he had a computer club and it wasn't networked.
...I had such a hard time figuring that out, but it was good that that was here. Because that's something that I . . . That's a cultural thing that I don't understand.

9.1.2.1i: Hannah. Hannah limited her concerns to the content of the presentation. She also suggested that the context scenarios helped her understand the needs of the audience (i.e. supporting the claim of empathy):

Hannah	Well, I think that the pictures really help. ...I mean, again, you start to identify with real end users.
Cynthia	Okay. Anything else?
Hannah	Well, I think that this *(pointing to the scenarios)*...you know...Again, these people are people who have real needs.

9.1.2.1j: Howard. In Howard's response he discussed: (a) using an interview as a research method; (b) that the distant audience introduces the need for local researchers (i.e. focusing on the composition of the research team); and (c) a number of users (sample size) needs to be consulted for each role:

Howard	Well, this is . . . it's for a culture that's much different than ours. I mean, I couldn't have generated these documents. ...I guess, this is part of my . . . this is part of my earlier point that I don't know anyone from there that speaks those languages that is of that social economic status. So, I think it would take either someone from that community or some significant interviewing. ...You would have to talk with a business owner, I think, to, or a few... a few business owners certainly to understand pertinent.

9.1.2.1k: Summary. There was a wide range of responses when asked about what factors affect the quality of personas and context scenarios among the study participants. There were five categories of concern: (1) research methods; (2) general concerns about the research; (3) informants of the research (i.e. the sample); (3) the presentation of the documents and (5) the effect of the distant audience. See Table 35 and Table 36 for a summary of findings from the study participants.

Maria and Marco, the two participants with the most experience using personas, focused more than the other participants on research. Conversely, those with no experience with the method were more likely to focus on the display or content of the presentation and the effect of the distant audience. This finding suggests that for

Designers new to personas and context scenarios, presentation might be a more dominant concern; however, as they become more familiar with personas the research supporting them becomes more salient.

Table 35: Summary of generated factors (research): study participants

	Research concerns and methods				Research team
	Interview	Amount	Transparency	Validity	
Leanne					
Lucy	Yes				
Lewis			Yes		
Luke			Yes		
Malcolm					
Marco		Yes	Yes	Yes	
Maria	Yes				
Heather					
Hannah					
Howard	Yes				Yes

Table 36: Summary of generated factors (other): study participants

	Sample			Presentation			
	Transparency	Variety /Composition	Sample size	Display	Content	Writing Quality	Distant audience
Leanne	Yes						
Lucy		Yes					
Lewis				Yes	Yes		Yes
Luke							
Malcolm				Yes			
Marco						Yes	
Maria		Yes	Yes				
Heather					Yes		Yes
Hannah					Yes		
Howard			Yes				Yes

9.1.2.2: Designer survey responders (*N* = 16)

Thirteen (81%) of the submissions contained concerns about one or more of the following: (1) presentation of personas/scenarios; (2) the research used; (3) composition of the research team; (4) sample used for the research; and (5) exogenous independent variables.

9.1.2.2a: Presentation. Five (31%) of the submissions contained a concern about presentation:

- Two submissions were concerned with content, for example:

  - "They both (personas and scenarios) have to be detailed enough to represent real users and situations without being paralyzed by minor details...striking the correct balance is critical," Respondent184.

- Two answers were concerned about the display of the documents: *"visual design"* (Respondent 077) and "*videos*" (Respondent 180).
- Respondent 040 was concerned about the presentation of the writing when he wrote, "*quality of written responses*."

9.1.2.2b: Research concerns. Three (19%) of the submissions contained research concerns; concerns included the amount, the quality and the methods used:

- Respondent 094 wrote that the quality of personas and scenarios depends in part on the "*amount of backing research.*"
- Respondent 007 submitted that "*the quality of the research performed before and while creating them*" was a concern.
- Respondent 040 suggested that "*type/method of data gathered*" effected the quality of personas and scenarios.

9.1.2.2c: Research team. Respondent 019 wrote that "*experience of researchers and writers*" of personas and scenarios was one of the factors affecting their quality.

9.1.2.2d: Sample. Three (19%) of the submissions contained concerns about the sample; concerns included sample size and the composition of the sample:

- Respondent 040 wrote that "*sample size*" was an important consideration affecting the quality of personas and scenarios
- Two submissions were concerned about the composition of the sample: Respondent 079 felt that "*first-hand access to a user's environment*" was important; Respondent 070 wrote:
  - "User researchers need to tap into users of that particular product first, and then scope out personas based on competitive products. The scenarios also need to follow this model. There should be a

> good mix of familiar users to the product to unfamiliar, role based personas "Admin" "manager" etc."

9.1.2.2e: Exogenous independent variables. Three (19%) responders included concerns about exogenous variables; variables included timeline/budget and organizational support:

- Respondent 069 felt that knowing the "*time and effort for the project*" was an important factor in the quality of personas and scenarios;
- Two respondents focused on organizational support:
    - "Support from management," Respondent 019
    - "Upper management needs to put a high priority on ensuring the scenarios are complete and consistent across the project very early on," Respondent 007.

9.1.2.3: UX Centric survey responders (*N* = 16)

Fifteen (94%) of the submissions contained concerns about one or more of the following: (1) presentation of personas/scenarios; (2) the research used; (3) composition of the research team; (4) the sample considered for the research; and (5) exogenous independent variables. Additionally, there were two respondents who wrote about considerations of the Designer audience.

9.1.2.3a: Presentation. Five (31%) of the submissions contained a concern about presentation:

- Respondent 082 suggested that "*writing quality and imagery*" were important factors affecting the quality of personas and scenarios
- Concern about the content of the presentation was included in three submissions, including:
    - "Specific and detailed information," Respondent 189
    - "Some profile details such as photos, number of kids, etc., are information that's more cutesy for ad agencies and less useful for actual design," Respondent 004.

- Finally, the content, writing quality and the display of the presentation were factors that Respondent 084 considered important:
    - "Having a clear differentiation between personas; having a good photo; the quality of writing for the narrative."

9.1.2.3b: Research concerns. Thirteen (81%) of the submissions contained research considerations, including general considerations, the amount of research, transparency of the research and the validity or quality of the research:

- Five respondents (31%) expressed a general concern that there simply be research backing personas and scenarios; submissions included:
    - "...appropriate research," Respondent 189
    - "...research - approach, material, etc," Respondent 069
    - "The research," (Respondent 093).
- Additionally two respondents posted questions about research:
    - "Are they based on real research with users, or on someone's assumptions or opinions?" (Respondent 076)
    - "Is the research based on "gut" or is it based on t;rue market research and analytics? Too often it's gut and wishful thinking?"(Respondent 004).
- Respondent 081 expressed that "*the amount and quality of the user research you can perform*" were important factors to consider when assessing the quality of personas and scenarios.
- The level of transparency between the research and the final persona/scenario documents was an important factor for Respondent 121:
    - "Make sure the team knows where this fictional persona came from--must communicate the research when presenting the personas."

- The last category of research concern was evident in five (31%) UX Centric responders, in which, consideration of the validity or quality of the research was mentioned:
    - "Quality of research," Respondent 089 and 121
    - "The quality of the research done," Respondent 095
    - "Quantity and quality of research; the planning and forethought that goes into the initial research plan," Respondent 004
    - "Quality of research in persona creation is important," Respondent 050.

9.1.2.3c: Research team. Respondent 083 wrote that "*writing ability of the creator*" and "e*xperience of the creator"* were two important factors affecting the quality of personas and scenarios.

9.1.2.3d: Sample. Respondent 076 wrote that it was important to consider, "*how typical*" the personas and scenarios were of "*the target audience.*"

9.1.2.3e: Exogenous independent variables. Six (38%) or UX Centric responders included concerns about exogenous variables; variables included timelines and organizational support both from the upper management and from the design/research team:

- Respondent 089 included timeline considerations when he wrote:
    - "Time & effort (you can't rush them)."
- Five (25%) of responders included the need for organizational support and team cooperation:
    - Team cooperation was evident in four responders submissions:
        - "Team's willingness to do the 'extra' effort," Respondent 069
        - "The buy-in from the team," Respondent 095

- "If the core research team isn't clear on their product and open to the research delivered to them, even the best data will be wasted," Respondent 050.

- Respondent 084 questioned the query when she wrote:
  - "Really though, to focus on the quality of the personas is maybe questionable...I'm sure there are medium-grade personas that have helped design teams make good decisions and there are beautiful personas that are posted in a conference room, looked at once, and never thought of again...having the best persona ever doesn't matter if it isn't socialized among the team and used."

- Respondent 083 was concerned about support from other parts of the organization when he wrote:
  - "Company environment; i.e., receptiveness to the content/ lack of political agenda when creating the materials *(sic)*."

9.1.2.3f: Designer considerations. Two (13%) responders included submissions of the emergent theme of designer considerations. Respondent 095 felt that "*the understanding of the team about how to use these tools*" was an important factor, suggesting that training was a key component affecting the quality of personas and scenarios. Respondent 089 submitted that the, "*imagination of the designer*," was an important factor to consider.

9.1.3: Comparison of job title types

Study participants and survey responders were asked an open-ended question about what types of factors they felt would affect the quality of personas and scenarios. Study participants were asked to consider the Kyrgyz documents as an example of personas and context scenarios. For this summary, I combined the findings from the Designer survey responders ($N = 16$) to the design study participants ($N = 10$) and compared what was salient to the Designer group as a whole to that of the UX Centric survey responders. In following sections, I summarize findings from each major coded

category: (1) presentation of personas/scenarios (section 9.1.3.1); (2) the research used (section 9.1.3.2); (3) composition of the research team (section 9.1.3.3); (4) the sample considered for the research (section 9.1.3.4); and (5) exogenous independent variables (section 9.1.3.5).

9.1.3.1: Presentation

The affect of presentation on the quality of personas/scenarios was mentioned more often by Designers than by the UX Centric group; however, this difference was not statistically significant. Additionally, the groups focused on different aspects of the presentation; whereas Designers were more concerned with the actual display, the UX Centric group was more concerned with the actual content and writing quality contained in the documents, see Figure 89.

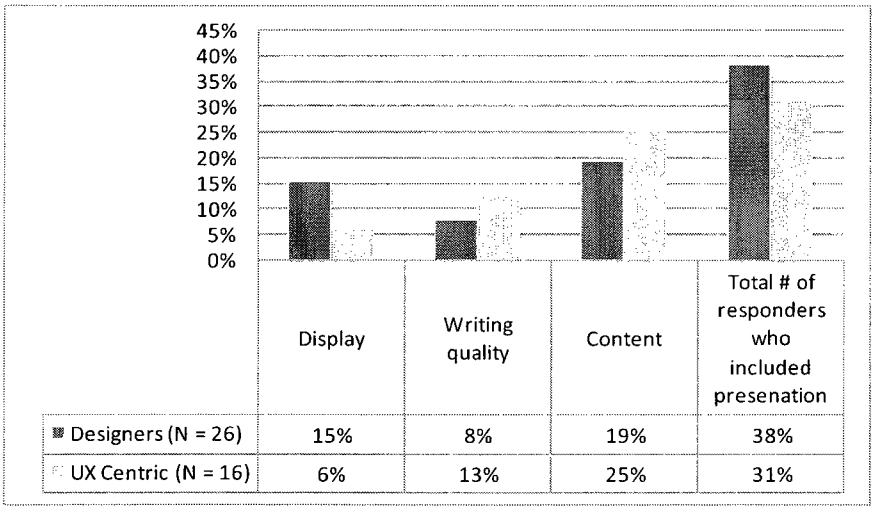


Figure 89: Generate factors: presentation

9.1.3.2: Research.

The importance of research to the quality of personas and scenarios was much more salient to UX Centric responders when compared to the Designer group; this difference was significant, χ^2 (1, N = 42) = 4.07, p <. 05. The only research area which Designers mentioned more often was in types of methods, see Figure 90.

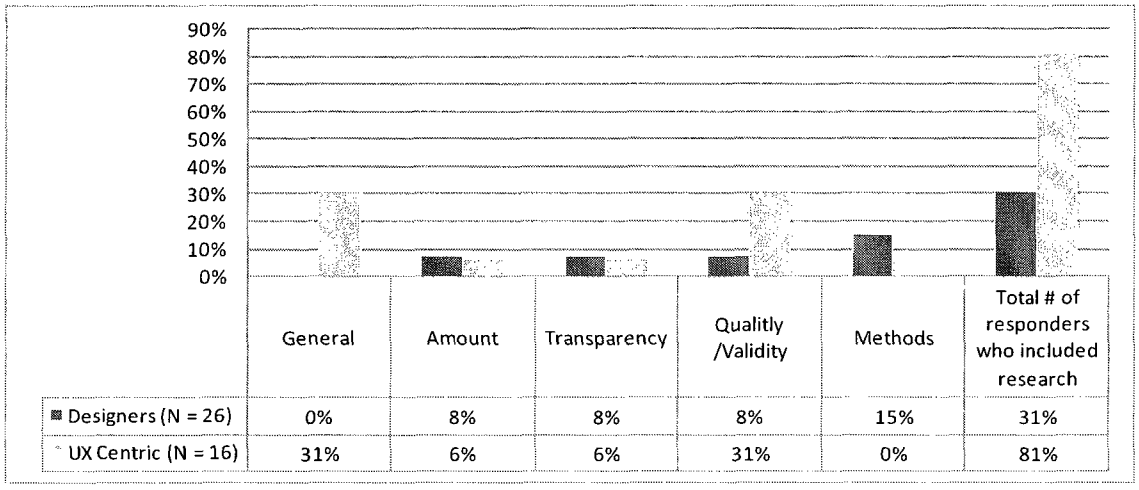


Figure 90: Generate factors: research

9.1.3.3: Research team.

The composition of the research team was not a dominant area of concern for either group, see Figure 91. Designers were slightly more likely to consider the research team an important factor affecting the quality of personas and scenarios.

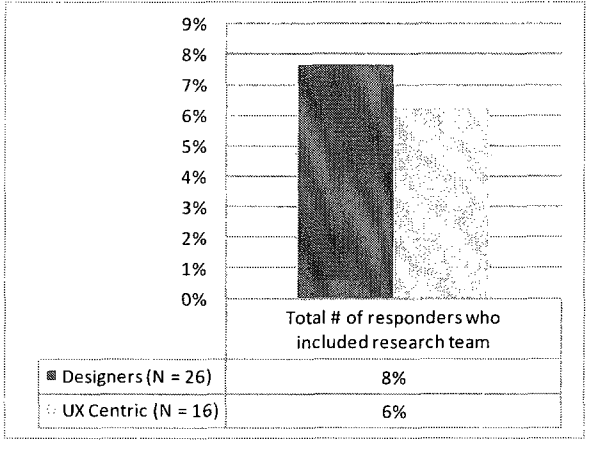


Figure 91: Generate factors: research team

9.1.3.4: Sample.

Considerations regarding the sample were another point of difference between the two groups in which Designers were more concerned about all aspects of the sample (size, composition and the level of transparency between the documents and the real sample), see Figure 92; however, this difference was not significant.

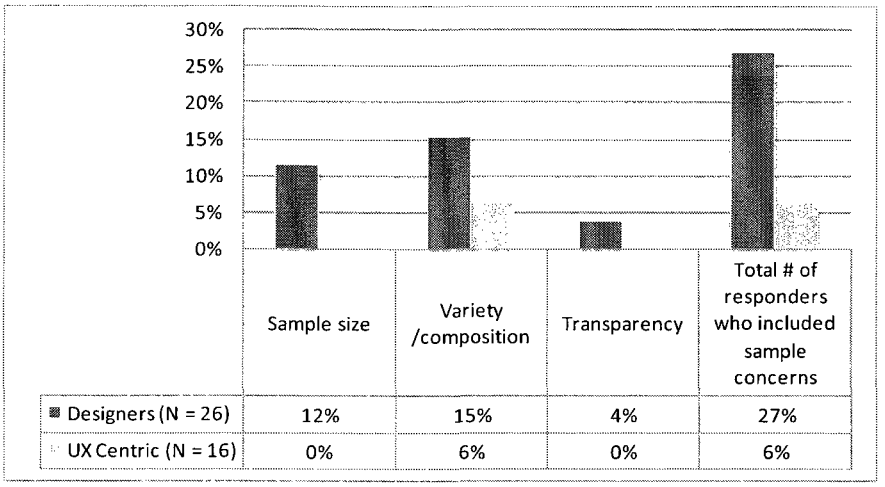


Figure 92: Generate factors: sample

9.1.3.5: Exogenous variables.

Exogenous variables were a greater concern to the UX Centric group than they were to Designers; the difference was significant χ^2 (1, $N = 42$) = 3.97, $p <$. 05. A key difference was the consideration of organizational support at the team level; only the UX Centric responders mentioned this, see Figure 93.

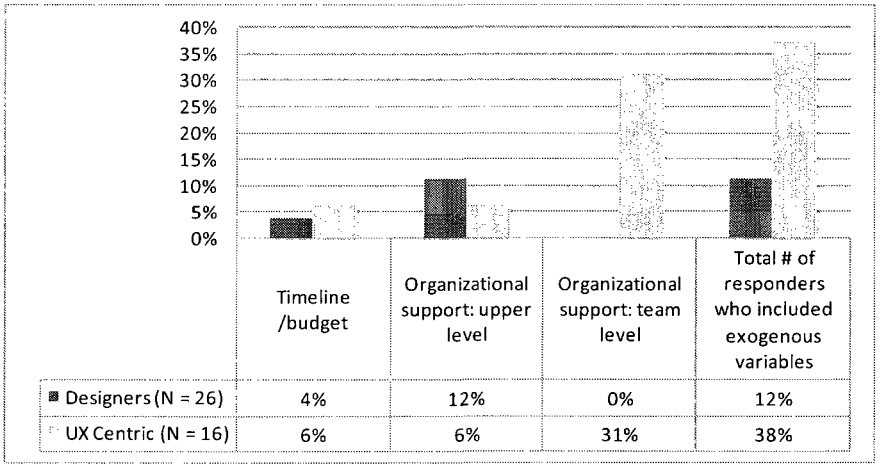


Figure 93: Generate factors: exogenous variables

9.2: Research methods

After generating unsolicited factors, study participants and survey responders were asked specifically about research methods. The next sections describe the

question and data analysis procedures for the responses (section 9.2.1.), findings (section 9.2.2) and a summary section (section 9.2.3).

9.2.1: Question and data analysis procedures

This question was phrased differently for the study participants than it was for survey responders. I first asked study participants to tell me what type of research you think one should perform before creating persona and scenario documents, for example, surveys, interviews, focus groups...all of the above? Next, I gave two hypothetical conditions (one presenting quantitative methods and one presenting qualitative methods) and asked study participants to reflect on the differences. The hypothetical situations were worded as:

> (1) These personas and scenarios were created using multivariate statistical analysis. Results that were included were statistically significant. What would you think?
> (2) These personas and scenario were created by analyzing interviews and probing for patterns in the responses. The patterns were independently verified by two researchers. What would you think?

Findings were analyzed for: (1) a method preference; (2) unsolicited responses about qualitative and quantitative methods; (3) salient considerations that were included in the responses; and (4) how they considered the meaning of the term 'statistically significant'.

Survey respondents were asked an open-ended question to describe how they thought a researcher/research team should gather and analyze information to create personas and/or scenarios. Respondents' answers were coded for: (1) research methods mentioned; and (2) salient considerations.

9.2.2 Findings

In the next sections, I first present the findings for the study participants (section 9.2.2.1) followed by findings from the survey responders (section 9.2.2.2).

9.2.2.1: Study participants (*N* = 10)

The discussion with each participant is presented in the next sections (9.2.2.1a-j) followed by a summary (section 9.2.2.1j).

9.2.2.1a: Leanne. Leanne indicated a preference for observational behavior information from data assessed through interview or survey techniques. Inter-rater reliability was a salient consideration for Leanne. The term 'statistically significant' did not have any meaning to Leanne.

Leanne	I think the best research would probably be to somehow record the person's behavior, or whatever ... without them . . . knowing, but not always aware, you know, I suppose for a certain amount of time.... Otherwise, surveys are pretty good I think.
Cynthia	So when you say pretty good, you find data from surveys to be believable?
Leanne	Well, I'm trying figure how else to get information... Yeah. If, I mean, if they're anonymous. ...And if they are not terribly long and easy to access. I'm trying to figure out how one would get actual information other than surveys.
Cynthia	Okay. So, if I were to say, these personas and scenarios were created using multivariate statistical analysis and the results were statistically significant. What would you think?
Leanne	I don't really know what that means. Statistically significant. It doesn't mean anything to me.
Cynthia	Okay. That's good information. If I were to say, these personas and scenarios were created by analyzing interviews and probing for patterns among the responses. The patterns were independently verified by two researchers. What would you think?
Leanne	I guess what I think about was that at least there is another side to the interview…
Cynthia	Can you tell me more about that? Are you talking about the number of researchers?
Leanne	Yeah. I guess two would be good. But I suppose if you were… I mean, three would probably be better.

9.2.2.1b: Lucy. Lucy indicated that she was not impressed with quantitative methods and might be more persuaded by data from one-on-one interviews. Lucy felt that the term 'statistical significance' was associated with a lack of one-on-one research and resulted in impersonal 'number crunching'.

Lucy	I think personal interviews with one-on-one are the most effective.
Cynthia	Okay. So, I'm going to give two examples here of how these possibly were created and I'm just going to get your feedback ....These personas and scenarios were created using multivariate statistical analysis and the results were statistically significant. That's one.
Lucy	Okay.
Cynthia	These personas and scenarios were created by analyzing interviews and probing for patterns in the responses. The patterns were independently verified by two researchers. So, first, let's go to that first one. And, what did you think about that statement? So, these personas and scenarios were created using multivariate statistical analysis and the results were statistically significant. What did that mean to you?
Lucy	It means to me that they didn't really talk to anyone. ...It just sounds like they took a lot of polls. They were crunching the numbers and they didn't think about sitting down and going on a case-by-case personal basis.
Cynthia	Okay. And then the next one. These personas and scenarios were created by analyzing interviews and probing for patterns in the responses. The patterns were independently verified by two researchers. What do you think about?
Lucy	That sounds to me like they actually went out and talked to some people.
Cynthia	So, it sounds to me like you have a more positive feeling about the interview process of those two...
Lucy	Yeah. I think it's the more useful scenario. ...I mean, I think polls and surveys are impersonal, but it's good, too. But I think you can get more, *(if you go)* out talking to a person face-to-face, especially if you're working on some of the new technological concepts, seeing first-person how they interact with that.

9.2.2.1c: Lewis. Lewis indicated a clear preference for qualitative interview methods. Salient considerations included a need for inter-rater reliability. For Lewis, the term 'statistical significance' meant that actual individuals were not consulted and instead results relied purely on 'number crunching'.

Cynthia	So, what kind of research do you think someone should have to do before creating documents like this? Examples could be focus groups, interviews, surveys, all the above.
Lewis	All the above.
Cynthia	All the above. What kind of research do you think would be most effective?
Lewis	Individual research. Yeah. Some focus groups.
Cynthia	Focus groups?
Lewis	And, ah, yeah. Maybe individual interviews, second. ...Because I think when you deal with a focus group, you choose the people there and then you do the individual interviews.
Cynthia	I'm going to give two examples of how these personas and scenarios were created and I just want to ask you what you think. Okay?
Lewis	Okay.
Cynthia	So, the first example is, these personas and scenarios were created using multivariate statistical analysis and the results were statistically significant. The second is, these personas and scenarios were created by analyzing interviews and probing for patterns and the responses. The patterns were independently verified by two researchers.
Lewis	I agree more with the second one.
Cynthia	You like the second one better? Okay. So, can we talk about that first one?
Lewis	Sure.
Cynthia	These personas and scenarios were created using multivariate statistical analysis and the results were statistically significant. What does that mean to you?
Lewis	That means that people crunched a lot of data. ...Based on responses of the individuals and they just looked at the data.
Cynthia	And you preferred this...these personas and scenarios were created by analyzing interviews and probing for

	patterns and the responses. The patterns were independently verified by two researchers. What about that did you like?
Lewis	I like the fact that they spoke to individuals. ...I like the fact that they sifted the data for common factors and that two people looked at the data afterwards, so it's not based on one person's opinion.

9.2.2.1d: Luke. In this exchange, with Luke he indicated that using a multi-method approach would be the best because (he believed that) depending on what people say was not reliable. However, he had a preference for qualitative interview methods when juxtaposed to using quantitative methods from survey data. Salient considerations included the composition of the research group/team. While Luke did not have the correct technical definition of 'statistical significance', it held a positive meaning associated with research rigor.

Luke	I think a mixture of everything is important.
Cynthia	Okay. And why do you say that?
Luke	Because sometimes there could be error, depending on the time that research is conducted. For instance, if you got a person in a bad mood, and they're taking their survey now, it could alter that. Or if they're in an interview, or they're not in the right mindset, and maybe not giving the right answers. And, also, honesty, too. Like, you don't know if people are saying what they ideally want for themselves or whether they're telling the exact truth.
Cynthia	Okay. And when you say people don't tell the exact truth? Do you mean, like, surveys, focus groups… or do you think that all those methods are susceptible to....?
Luke	You need to go in all arenas to, kind of, get a better picture.
Cynthia	If I were to say, these personas and scenarios were created using multivariate statistical analysis and the results were statistically significant. What would you think?
Luke	I think that would be good, if they're significant.
Cynthia	What does significant mean to you?
Luke	Significant means that it makes sense.

Cynthia	And when you say 'it would be good' if it's significant, what do you mean by good?
Luke	It means it falls within your reasonable parameter of a positive outcome.
Cynthia	Okay. If I were to say, these personas and scenarios were created by analyzing interviews and probing for patterns and their responses. The patterns were independently verified by two researchers. What would you think?
Luke	I would want to know, I mean, their background, their experience, and if I would need to hire more researchers to confirm their data.
Cynthia	Okay. Now, was there any one of the methods that I just talked about that you felt was better than the other?
Luke	Probing for patterns, I think. That would be really useful, because I'm sure there are ways where you can, like, see how their mind is . . . I don't know how to explain it.
Cynthia	So, you think that interviews would get more inside of the way the person's thinking?
Luke	Yeah.
Cynthia	I don't want to put words in your mouth...
Luke	It's more open-ended. ...Yeah. You can gain a lot more information when it's open-ended, where they describe . . . they try to communicate it across.

9.2.2.1e: Malcolm. Malcolm did not clearly identify a method or method type preference; however, he did suggest that statistics make the research feel less tangible and that user stories have more power for him. Salient considerations included sample size and sampling methods, inter-rater reliability and the composition of the research team. Additionally, the distance of the audience was a focus of his conversation in which he suggests that the quality of the Kyrgyz personas and scenarios could have been greatly improved if there was some comparison data for context. Malcolm associated the term 'statistically significant' with research rigor.

Malcolm	Well the thing that seems like the glaring omission . . . ...here is comparisons of what happened in other countries, if there's any kind of comparison you can do.

In this other Eastern European country, such and such happened. We got ...This country was comparable, because it had a comparable population, and demographics, and age groups, and regional topography, and etc. And in their first three years, they were able to sell 10% of the people and such and such. So, I would say, definitely that is a glaring omission. And certainly, it's, kind of, all relative to the size of the investment. If you said, okay, you know, were going to be spending . . . We're in for half a million dollars. You know, we'd be stupid not to spend $50,000 on making sure that this, you know, the other 90% was well spent.

Cynthia Okay. So, if I were to say these personas and scenarios were created using multivariate statistical analysis and the results were statistically significant, what do you think about? What does that mean to you?

Malcolm Well, I'm not a statistician.

Cynthia Okay. So, what does that mean to you?

Malcolm It's a... I'm a Capricorn.

...So, what that means is...Okay. Sure. That's important. We had a statistician do the statistics. But that's one level of a separation away from, well we went and spent a month living in Kyrgyzstan. We saw that, you know...

...Kids as young as eight have cell phones there. Whatever. I'm joking in part....when I say I'm a Capricorn, but I'm, you know, looking for the ground. Let's say I'm a topographer, I'm looking for the ground truth.

...I want to know exactly who's there. I want to see video of, we were there and here's what it looks like in the town square. Look, everybody's talking on their cell phones. Everybody's already got a cell phone. Or, you know, here's the chart showing the increase in cell phone sales over the . . . Or, the cell phone market is already saturated. Or, people's cell phones are six years old. You know? They're not buying these, or whatever . . .

Cynthia If I were to say these personas and scenarios were created by analyzing interviews and probing for patterns in the responses. The patterns were independently verified by two researchers. What do you think?

Malcolm You know, it just seemed a little gobbly gook.

	...The personas and scenarios were created by analyzing interviews... It doesn't say interviews with 100 randomly-sampled . . . ...You know, it doesn't give me a number and say, you know, we interviewed 50 men and 50 women.
Cynthia	So, there's just not enough information?
Malcolm	Or we interviewed 50 head of households and 50, ...It's kind of too abstract for me.
Cynthia	All right. So, what I'm hearing you say is that methods do matter to you, but you really want to know, kind of, where the rubber's hitting the road on the methods?
Malcolm	That's fair to say. I mean, yeah. I really appreciate it. I'm a scientist and I appreciate the, yes, these were statistically significant. I mean, that's important.
Cynthia	What does statistically significant mean to you?
Malcolm	Well, it means that somebody is using a rigorous scientific method and they understand what statistically significant is. And they've got a random sample. And they, you know...Great, you had two professionals analyze it. You got a second opinion. You paid a professional and it's not like me and my programmer friend thinking, hey, this might be a good idea.

9.2.2.1f: Marco. Marco preferred a multi-method approach suggesting that surveys were preferable for larger samples and interviews were better for communicating other types of information including frustrations. He associated 'statistical significance' with research rigor and suggested that statistical techniques are less prone to 'interpretation'.

Marco	I think a combination of things. The surveys are a good way to, kind of, get that number of people. ...I think it's good to have a couple of, you know, powerful quotes here and there. If there's a user group that has a certain frustration about something, and if there's a voice or two in that group that really, kind of, capture their frustration, I think it's good to have that kind of information.
Cynthia	Do you think that personas are effective at transmitting frustrations...because you've brought it up a couple of times?

Marco	I think that's probably because I've been working at [product name], which seems to have a lot of frustration with users. I think, yeah, in general that's one of the ways that I'm familiar with it. ...It seems like a lot of the positives are, kind of, glanced over. That might be just a cultural thing.
Cynthia	Okay. If I were to say, these personas and scenarios were created using multivariate statistical analysis and the results were statistically significant. What would you think?
Marco	It sounds very professional and I would have a hard time questioning things. Like, if I heard that, I would just, kind of, assume that a lot of good work went into it.
Cynthia	Okay. If I were to say these personas and scenarios were created by analyzing interviews and probing for patterns in the responses. The patterns were independently verified by two researchers. What would you think?
Marco	I would believe that there was, you know, some work and care put into them.
Cynthia	Was there one of the explanations that seemed more impressive than the other?
Marco	I think they all seem, kind of, impressive in those regards. ...I think the first one seems more impressive, I guess. If I had to pick one.
Cynthia	And that's because it was talking about stats, statistical analysis?
Marco	Yeah. Yeah. The second one seems that there's a little bit of interpretation. ...I would, kind of, want both. I think a good researcher, you know, is able to interpret patterns and things.

9.2.2.1g: Maria. Maria did not focus her answer on methods; instead she concentrated on the need to understand the composition and experience of the research team.

Cynthia	If I were to say, these personas and scenarios were created using multi-variant statistical analysis and the results were statistically significant. What do you think?
Maria	If I don't know the person, then I would like to get actual information on what those data are. Where they come from?

Cynthia	If you don't know the user researcher, you actually want to know who they are?
Maria	If I was a client, to see actual paperwork or the paper trail behind the information.
Cynthia	If these were just handed to you and no one said how many people were involved and what the methods were, would you want to know more?
Maria	Yes. Yes, definitely.
Cynthia	If I were to say, these personas and scenarios were created by analyzing interviews and probing for patterns in the responses, the patterns were independently verified by two researchers. What would you think?
Maria	I would find out who those researchers are. ...I mean, it's like a small community, and you may know them or you may know what companies they work at. So, the longer you've been doing user experience, the more you understand who are the key players or the key companies, making it more legitimate. Like Blink worked with a research company based in New York City and I kind of question their expertise.
Cynthia	Because you didn't think they'd been around long enough, or . . . ?
Maria	They didn't seem as professional or as experienced as other people; other researchers. ...I don't know. Maybe it's like an east coast, west coast kind of thing. I don't know. In the west coast, UX is more established, or . . . I don't know.

9.2.2.1h: Heather. Heather did not voice a clear method preference but did prefer the qualitative hypothetical situation. Salient considerations included the audience distance and inter-rater reliability. Finally, the term 'statistical significance' had no meaning for her.

Cynthia	What kind of research do you think people should have to do before they create documents like these? Examples could be surveys, interviews, focus groups, all the of above...?
Heather	Again, in Russia?
Cynthia	If there's a difference, both.
Heather	I can't imagine you could hold focus grous over there. I don't know. In the US, we always do focus groups.

...I would think to maybe get the ball running in both places you might want to send out an email survey, or a survey, by mail maybe.
...Depending on where you are.
...So, how do you get the email addresses? How do you get the mail addresses to determine, you know, who would be interested? I guess you would have to research that first of all.
...I mean, here we do demographic studies. Here we do all this stuff, you know, by neighborhood. How much does this neighborhood earn per capital? All this stuff.
...But that's not going to exist in this part of the world.
...You know? And there's not the vast difference in income. I mean, there's such a smaller income anyway. There's not that vast difference that you see here. And clearly demographics are, I think, used here all the time for cutoff points for different types of projects.

Cynthia If I were to say, these personas and scenarios were created using multivariate statistical analysis and the results were statistically significant. What would you think of that statement?

Heather I wouldn't have a clue.

Cynthia Okay. It doesn't mean a thing to you?

Heather It doesn't mean a thing.
...I mean, yes, it does. I mean, I'm just . . . When you start throwing all that stat stuff at me, it's just like . . . give me the stuff.

Cynthia Okay. All right. ...that's great. If I were to say, these personas and scenarios were created by analyzing interviews and probing for patterns and the responses, and the patterns were independently verified by two researchers. What would you think?

Heather I think that's a good statement.

Cynthia By good, you mean . . . ?

Heather It tells me what the process was. It tells me that there was more than one person analyzing the information from the people with persons' scenarios.
...It might be better to have more than two looking at it independently.
...Depending, I guess, on how large your sample base was.

9.2.2.1h: Hannah. Hannah suggested that different methods were good for getting different types of information; as such, she did not have a clear preference for qualitative or quantitative methods. However, she did suggest that qualitative methods may be better suited for acquiring the type of information in the personas and context scenarios. She also suggested that statistical significance was associated with a larger sample.

Hannah	Well, let's see. I think focus groups. ...And interviews.
Cynthia	Focus groups. Interviews. Okay.
Hannah	I think surveys are good for getting some of this personal stuff, but not capturing what the real needs are, as well.
Cynthia	If I were to say, these personas and scenarios were created using multivariate statistical analysis and the results were statistically significant, what would you think?
Hannah	I would think that you probably got a lot of data from a bunch of different people. ...From a lot of different people.
Cynthia	Okay. And if I were to say, these personas and scenarios were created by analyzing interviews and probing for patterns and their responses. The patterns were independently verified by two researchers. What would you think?
Hannah	I guess I would think that would be, again, it would be a smaller sample size. ...Just from the time it takes to do something like that, I think, probably.
Cynthia	Okay. Is there any preference between these two methods? Would there be any difference in believability of the documents? Or do they both sound good?
Hannah	To me, it seems like it would be difficult to, kind of, get some of this stuff using the statistical analysis information. ...Because some of what you've captured in here is not just, you know, it's not quantity there, but it's , kind of, the overall experience. ...And, so, I think that interviewing and talking to people tends to capture that, you know, experience aspect of

what the, you know, end users want to be able to do with the tools.

9.2.2.1j: Howard. Howard suggested that different methods might be best for the different documents (personas versus scenarios). Howard explained that as he has gained experience he has more respect for qualitative methods. While he did not have a clear preference for quantitative methods versus qualitative, he did suggest that in the case of personas and scenarios qualitative methods would be more appropriate because he felt that researchers would not be required to know the research question before beginning an investigation. Howard associated statistical significance with a large sample size.

Howard	Something like this that might be more valuable out of a focus group *(points to the personas)*. ...And then something like this would probably be better using interviewing. *(points to the scenarios)*. ...Also, with the demographics and information you could gather a lot of that just from a good search.
Cynthia	If I were to say, these personas and scenarios were created using multivariate statistical analysis and the results were statistically significant. What would you think?
Howard	Well, they wouldn't surprise me. ...I mean, first of all, I knew that just from the fact that you have 13% of the survey respondents represent Roza. ...So, clearly, it was gathered from something of significance. ...That means you interviewed a lot of people.
Cynthia	If I were to say, these personas and scenarios were created by analyzing interview protocol and probing for patterns in their responses. Their responses were independently verified by two researchers. What would you think?
Howard	Well, I mean, the first is quantitative and the next is qualitative.
Cynthia	Right. Are you more impressed by one over the other?
Howard	No. If you asked me a couple of years ago, I would have said the first.

> ...But, I guess the qualitative is growing on me. I think it has value when generating something like this.
> ...In fact, it's probably . . . it would probably be easier to generate a lot of the . . . Oh, let me think about that a second. The value of the qualitative is that you don't have to necessarily know what you're going to ask ahead of time, because you're interviewing. Whereas to do the quantitative, you need to know what you're going to ask ahead of time, so you're, kind of, presupposing what the answer is. So, let's give the qualitative a boost on that.

9.2.2.1j: Summary of methods query for study participants. Answers were analyzed to better understand how Designers consider methods when given personas and context scenarios. The perception of the research is an important aspect to the persuasiveness of the data, and, therefore, has power to influence whether a real designer will take on the role of the Mock Designer.

A majority of the study participants indicated a clear preference for qualitative methods. Seven of the ten participants suggested that qualitative methods would be a better approach for creating personas and context scenarios; the remaining three participants did not indicate a clear preference. Interviews and focus groups were the two most identified methods, see Table 37.

Table 37: Method questioning for study participants

	Method preference	Type of method preference	Salient considerations				Statistically significant meaning
			Inter-rater reliablity	Reseach team	Distant Audience	Sample size/ sampling method	
Leanne	Observational behaviorial methods	Qualitative	Yes				No meaning
Lucy	Interviews	Qualitative					Impersonal data
Lewis	Focus groups followed by interviews	Qualitative	Yes				Means people crunched a lot of data/ impersonal
Luke	Multi-methods	Qualitative		Yes			Unclear but a positive meaning associated with rigor
Malcolm	Not clear	None	Yes	Yes	Yes	Yes	Implied research rigor
Marco	Multi-methods	None					Implied research rigor
Maria	Not clear	No clear preference		Yes			(She did not indicate)
Heather	Not clear	Qualitative	Yes		Yes		No meaning
Hannah	Focus groups and interviews	Qualitative					Many people were consulted/large sample size
Howard	Focus groups and interviews	Qualitative					Many people were consulted/large sample size

Participants focused on different considerations. Four participants felt that inter-rater reliability was an important consideration by noting that the second hypothetical research team which introduced independent verification sounded like a good research approach. Three participants brought up the importance of understanding the composition and experience of the research team. Maria was especially adamant about the need to know who created the documents. The distance of the audience was a salient consideration for both Malcolm and Heather. Malcolm felt that it should influence the content of the personas and scenarios requiring more comparable context and Heather felt that the audience distance would influence the research methods. Only Malcolm indicated that sample size and sampling methods were important considerations.

The term, 'statistical significance', had multiple meanings among the participants. The term held no meaning for two participants (Leanne and Heather). Two participants held a negative impression of the term indicating that statistics introduced an impersonal number crunching approach (Lucy and Lewis). Three associated the term with research rigor (Malcom, Marco and Luke) and held statistics in a somewhat high regard; however, Luke still preferred qualitative methods for persona and context scenario creation. Finally, Hannah and Howard had somewhat neutral feelings about statistics but indicated that the term was associated with larger sample sizes.

9.2.2.2: Survey responders (*N* = 32)

Survey respondents were also asked to describe how they think a researcher/research team should gather and analyze information to create personas and/or scenarios. In the next sections, I present the findings from the respondents with Designer job titles (section 9.2.2.2a) followed by the UX Centric job titles (section 9.2.2.2b). This is followed by a summarization of the findings from the two groups (section 9.2.2.2c).

9.2.2.2a: Designers (N = 16). Thirteen of the sixteen respondents provided answers that included a description of methods and/or salient considerations when conducting research for personas and scenarios.

- *Methods.* Interviews were the most common methods discussed. Other methods included were contextual inquiry or in-context observational methods, surveys, market research, brainstorming, and artifact analysis. Submissions included:
    - Five (31%) of the sixteen responders mentioned interviews as one of the methods to consider:
        - "Firsthand contact, interviews would be next," Respondent 094
        - "Finding and interviewing potential users and learning who they are and what they want," Respondent 007

- "User interview," Respondent 019
- "Talking to users who call on technical support lines," Respondent 184.

Finally Respondent 079 combined interviews with the importance of context when she wrote:

- "Preferably in-person interviews in the user's environment, asking them questions about how they use the current system and what they expect from the new system, etc."

- Seven (44%) of the sixteen responders included contextual inquiry as a method and/or the use of observation in context as important methods or method consideration. See Respondent 079 above for one of these submissions. Other submissions in this theme included:
  - "Customer visits," Respondent 077
  - "The research team needs to be out at the user's site, ideally in an embedded situation," Respondent 071
  - "Site visit," (Respondent 019)
  - "One should go out in field and observe the users in their environment," Respondent 178
  - "Research users at the users' workstation or office at different points in the work cycle...observe the user working," Respondent 104
  - "Observations and contextual inquiry are best," Respondent 094.
- Four (25%) of the sixteen responders mentioned surveys:
  - "Quant surveys," Respondent 077)

- "Surveying users who are satisfied with existing products," Respondent 184
- "Encourage thought-out, written responses over check boxes or a selection from a list," Respondent 040.

Respondent 094 suggested using surveys after using interviews and contextual inquiry:

- "Observations and contextual inquiry are best -- firsthand contact. Interviews would be next, followed by more detailed surveys."

- Three (19%) of the sixteen responders suggested using market research or looking at competitors in the space:
  - "Sample from existing product users and competitive product users," Respondent 070
  - "Problem domain research," Respondent 019
  - "You need to understand who is going to use/buy the product...this can only be arrived at by doing market research, "Respondent 007.
- Respondent 085 suggested that brainstorming was a good method to use when creating personas and scenarios when he wrote:
  - "Brainstorming sessions with clients."
- Respondent 104 felt that user artifacts were an important consideration:
  - "Gather user artifacts such as reports."

- *Other salient considerations.* Other than the concern for observation and context discussed in the previous section, respondents also included considerations of sample composition and size, data analysis techniques and the content of the to-be-gathered data.

- Two (13%) of the sixteen responders were concerned with the sample in their submissions:
  - "I think they should sample from existing product users and competitive product users...their roles within organizations should range from inexperienced to experienced," Respondent 070
  - "Engage as many target users as possible," Respondent 040.
- Respondent 127 was concerned about data analysis methods when she wrote:
  - "Combine information and separate in a way that information is reasonably the same."
- The content of the data that should be gathered was a concern for Respondent 079 when she wrote that researchers need to gather information:
  - "About how they use the current system and what they expect from the new system."

9.2.2.2b: UX Centric (N = 16). Fourteen of the sixteen respondents provided answers that included a description of methods and/or salient considerations when conducting research for personas and scenarios.

- *Methods.* Interviews were also the most common method discussed by UX Centric responders. Other methods included were contextual inquiry or in-context observational methods, focus groups, surveys, market research, and literature review. Submissions included:
  - Eight (50%) of the sixteen responders suggested that interviews be at least one of the methods to consider:
    - "Interview users," Respondent 101
    - "Interviews," Respondent 082

- "Talk to the client - define their goals - speak with users," Respondent 081
- "Talk to the real 'users' (interviews)," Respondent 069
- "Interviews and/or coffee talks (my own methodology)," Respondent 093.

Two respondents combined an inclusion of interviews with sample considerations:

- "There should always be as many interviews as possible," Respondent 095
- "5-15 interviews, depending on the breadth of the target audience," Respondent 089.

Respondent 121 combined usability with interviews when she wrote:

- "Face to face interviews...usability studies post interviews."

o Four (25%) of UX Centric responders focused on contextual inquiry and observing users in context:

- "I'm a big proponent of contextual inquiry (or interview-based usability testing) - meet the users where they are (e.g. at home) and watch what they are trying to do and how they are trying to go about it," Respondent 076
- "Observations and contextual inquiry are best," Respondent 094
- "They can directly contact relative persons in relative field," Respondent 022
- "Field research is very important," Respondent 121.

- Two (13%) of the responders suggested that focus groups were good methods to use when collecting data for personas and scenarios:
  - "I like a combination of focus groups," Respondent 193
  - "Focus groups," Respondent 189.
- Respondent 189 wrote that in addition to focus groups she suggested that "*surveys, questionnaires*" were appropriate methods.
- In addition to field research and interviews, Respondent 121 suggested that "*marketing data*" was an important consideration;
- Respondent 069 suggested that a literature review in addition to interviews was an important consideration:
  - "Refer to reference materials - online, books, etc."

- *Other salient considerations.* Other than the concern for observation and context discussed in the previous section, respondents also included considerations of sample composition (segmentation) and size, data analyses techniques, content of the to-be-gathered data, inter-rater and researcher reliability, research team composition, exogenous factors, research transparency, and presentation:
  - Three (19%) of UX Centric responders included considerations of sample segmentation and size: Respondent 101 suggested that interviews needed validation "*with larger sample*".
    Respondent 004 suggested that segmentation was important prior to collecting research when she wrote:
    - "First slice the entire possible universe into pieces and look at how important each slice is...often a slice that everyone focuses on is not a major buyer/target compared to the whole...focus research on just the slices that are worth the work and will return revenues."

Respondent 089 first discusses segmentation followed by a suggestion of the sample size needed for interviewing:

- "I think a team needs to first decide who its audience is. (Everyone is not an answer -- who are they really, truly targeting? Who MUST they please for their business to survive?). It can be helpful for a business site/application to break this down further -- by industry, segment, etc. But not necessary. From there, research…5-15 interviews, depending on the breadth of the target audience."

- Five (31%) of responders with UX Centric job titles included submissions that discussed data analysis:
  - "Walk through the results person by person - start pulling out commonalities...start grouping commonalities - are there patterns emerging?" Respondent 082
  - "Appoint a central secy *(sic)* to gather info from all team members and analyze it," Respondent 004
  - "Patterns should be deduced and grouped.... personas should emerge," (Respondent 089)
  - "Look for patterns in interviews," (Respondent 101).

Respondent 084 discussed in great depth the data analysis methods that worked for her in the past:

- "One method that has worked well was to take those poster-sized post-its and use one to list each user's goals, objectives, behaviors, and obstacles. Then those posters were sorted by the team almost like an affinity diagram, with similar users together. We've also used the method where you define several spectra with defined endpoints, and scored each user along each spectrum, then grouped users with similar patterns together. For example, the spectrum for how comfortable someone is working with technology might range from technophobe to gadget freak, with a range of points in between."

- Two (13%) of the submissions were concerned with the content to be gathered:
  - "Use methods that gather info about user habits, desires, needs, etc," Respondent 189
  - "Interviews should drive at goals, motivations, habits, likes, dislikes, prejudices, desires, etc," Respondent 089.
- Reliability among researchers was a concern for two UX Centric responders:
  - "It is good to have several people working together on the analysis because the analysis can become or feel like it's becoming subjective," Respondent 084
  - "Have a list of set questions as well as a couple of open-ended ones that everyone gets asked so as to compare apples to apples," Respondent 004.
- Two (13%) of responders included concerns about the research team composition:
  - "Have someone from the marketing team involved as well as other stakeholders," Respondent 189
  - "The team should be involved in the research effort," Respondent 095.
- Exogenous factors were important considerations for two responders:
  - "Depending on project (scope, audience, time, etc), validate with larger sample," Respondent 101.
  - "Depends on budget and resources," Respondent 050.
- Respondent 089 included concerns about research transparency and presentation in his submission when he wrote that the data:

- "...can be included in the functional spec if there is one, but more importantly, should be socialized with the design team in a kick-off or other meeting...everyone should know they were derived. (In my opinion, btw, the research function should not be divorced from the design function)."

9.2.2.2c: Summary: methods, survey responders. For both groups, interviews and other qualitative methods were the most mentioned approaches, see Figure 94. Surveys were also commonly mentioned by Designers; however, only one UX Centric job title responder mentioned surveys.

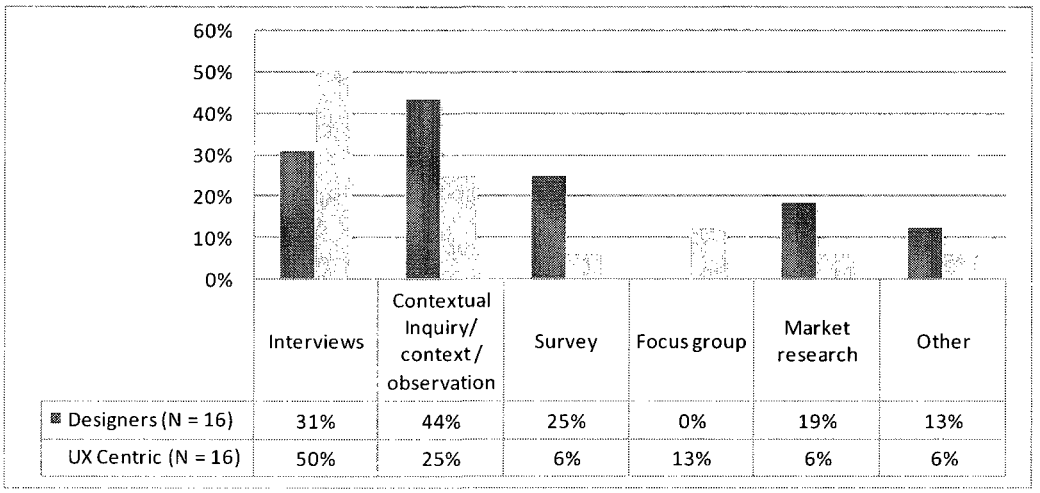


Figure 94: Methods discussed by survey responders

Salient considerations differed between the two groups in two major ways, see Figure 95. First, the UX Centric responders were much more likely to mention any type of additional consideration, (presumably because they are more likely to have been responsible for the research and have therefore encountered more items of consideration). Second, almost a third of the UX Centric group was concerned with data analysis while only one in the Designer group expressed this as a consideration. Again, this was probably because the Designer group is rarely tasked with the data analysis.

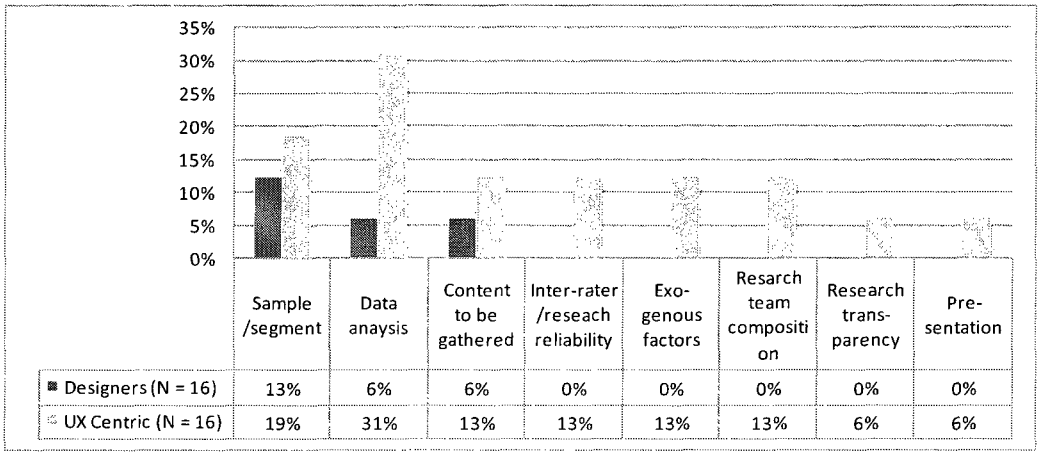


Figure 95: Other salient considerations of survey responders

9.2.3: Summary of research methods

When asked directly about methods, qualitative methods were mentioned much more often and considered appropriate for research for persona (and context scenario) creation by most participants and survey responders. The most common method mentioned by study participants and survey responders was interviews, followed by contextual inquiry. Surveys and focus groups were also commonly mentioned methods.

Salient considerations for Designers from both the design study and survey included the need for inter-rater reliability, the composition of the research team and sample size or sampling methods. Data analysis techniques and the content to-be-gathered were each mentioned by one survey responder.

9.3: Research transparency

Survey respondents were asked two additional questions about research transparency (study participants were not asked these questions). This set of questions addresses the criticism that personas are not believable because they were either not regarded as based on real data, or their relationship to the data was unclear. The next sections describe the question and data analysis procedures for the responses (section 9.3.1.), findings (section 9.3.2) and a summary section (section 9.3.3).

9.3.1: Question and data analysis procedures

First, respondents were asked to rate on a scale from 1-5 how important they felt it was to understand how the personas they had used in the past were created. Explanatory text was also included to help the respondents understand the question. The explanatory text read:

- "In other words, do you care about the research methods and/or analysis methods used to create personas and/or scenarios? Examples of research methods might include online surveys, door to door surveys, and interviews. Examples of analysis methods might include statistical analysis and interview transcript analysis."

Non parametric tests were deployed to explore if the level of research transparency was associated with other designer-related independent variables (age, gender, professional experience, job title, empathy scores, HCD orientation alignment scores, and the number of projects in which personas were used).

After the rating question, the survey displayed an open-ended query which asked responders to add any thoughts they had about the importance of the transparency of research methods used to create personas. These answers were analyzed for mention of believability associated with research transparency.

9.3.2 Findings

In the next sections, I first present the rating respondents gave pertaining to the importance of method transparency (section 9.3.2.1). This is followed by the responses from the open-ended question about research transparency (section 9.3.2.2).

9.3.2.1: Method transparency ratings.

Survey responders were first asked to rate the level of importance for Designers to understand how the personas (or scenarios) were created. Choices ranged from 'very important' to 'very unimportant'; additionally, responders could select a write in option in which the responder was presented text that read, 'I have never thought about

it before, but now that you mention it, I guess I would say,' followed by an open-ended write in field.

Designers rated the importance higher than the UX Centric group. Most (75%) of Designers rated transparency as important or very important, and 60% of responders with UX Centric job titles rated the importance as high, see Figure 96. One UX Centric responder (Responder 093) selected the write in response suggested that transparency was dependent on "*on how representative they feel the research was.*"

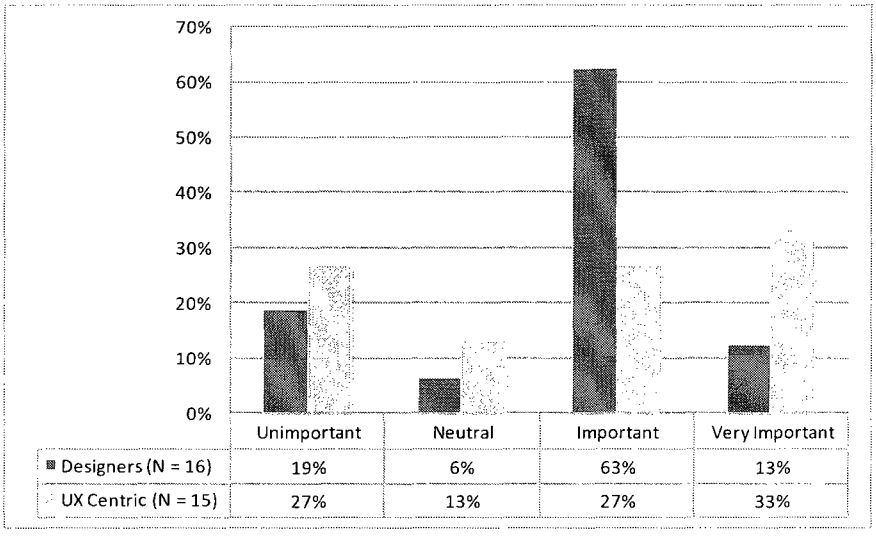


Figure 96: Importance of method transparency

Non parametric tests were deployed to explore if the level of research transparency was associated with other designer-related independent variables (age, gender, professional experience, job title, empathy scores, HCD orientation alignment scores, and the number of projects in which personas were used). No clear patterns emerged from the analysis.

9.3.2.2: Method transparency open-ended responses

Following the rating question, respondents were asked to reflect on the importance of transparency in an open-ended query. All of the reasons given for the importance of research transparency were associated with believability. These responses suggest that the apprehension that personas/scenarios are not believable due

to insufficient research or insufficient ties to the underlying research is well founded in the UX community. A few respondents also suggested that having raw data available facilitated later conflict resolution if the team either did not find the original personas believable or if the design team could not find clear guidance from the given personas. In the next sections, I present the findings from the Designers first (section 9.3.2.2a) followed by the UX Centric group(section 9.3.2.2b) and a summary (section 9.3.2.2c).

9.3.2.2a: Designers (N = 16). The findings about the open-ended query pertaining to transparency are presented in order of the rating the respondent gave. Not all respondents answered this query.

- *Very important rating (N = 2).* Only one Designer respondent who gave research transparency a 'very important' rating also completed the open-ended query; his response was concerned about the believability of the documents. Respondent 007 wrote that transparency is critical:
    - "…when large numbers of team members are surprised by the personas presented to them. They have to be convinced that this stuff isn't just some weird fiction arrived at by dubious means."

  This respondent is also suggesting that as personas achieve the beneficial claim of stereotype avoidance it becomes more imperative that the research is transparent.
- *Important rating (N = 10).* Six Designer respondents who gave research transparency an 'important' rating responded to the open-ended query; five expressed a need for transparency of the research to increase the believability:
    - "I think the better one understands the process/methods of the inputs to their work, the better," Respondent 019.
    - "It is always important to know where the data is coming from, how reliable it is, etc. It would be terrible to build a feature a certain way given a persona only to find out that the sample size was too small or unreliable," Respondent 040.

- "The transparency of the research methods used are important in order for the development team to feel that they can have faith in the information presented to them," Respondent 071;.
- "If they think you just made it up, it won't fly," (Respondent 077.
- "If a researcher uses a method that I think is ineffective, I will discount the conclusions," Respondent 104.

Respondent 070 suggests that transparency is important to help later conflicts among the design team:

- "If there is a particular sticking point on a feature with development, it's always possible to consult with research and see if that may have been the cause to a particular result."

- *Neutral rating (N = 1).* While Respondent 094 gave the importance of transparency a neutral rating, his explanation stressed the importance of research transparency for the personas/scenarios to be believable:
  - "They need to know that there is research and 'science' to it, that work has been done and it is not just an opinion. In our case, we need to show that we are talking to 'the average user' and not our pool of experts--that we're not getting biased opinion."

- *Unimportant rating (N = 3).* Only one of the responders who felt that research transparency was unimportant submitted a follow-up query response that was coded. Respondent 184 submitted that:
  - "I think it's usually fairly obvious if the personas and scenarios reflect real users and situations."

This response suggested that the respondent had preconceptions about the user audience and that if the personas did not align to the preconception she would not find them believable regardless of research transparency.

9.3.2.2b: UX Centric (N = 16). As with the responses from the Designer group, the findings are presented in order of the rating the respondent gave. Again, not all respondents answered this query.

- *Very important rating (N = 4).* Three responders answered the follow-up open ended query in a way that could be coded:
    - Respondent 069 felt that transparency was 'imperative to believability":
        - "It is very important, in fact imperative, that the research be transparent. Documentation 'as is' helps, everyone be on the same page, *(and)* it takes care of the research not influencing the study by making the profile/scenarios being 'unbiased.' *(sic)* Since things are transparent, they can be referred to and traced back, and *(therefore)*, the originality and the context of comments /observations are retained."
    - Respondent 076 expressed concern that if personas/scenarios are created without research than the believability of UX research in general is later questioned:
        - "Even in my UCD role it is all too easy to assume things when time is tight *(that)* placing a strong emphasis on the data quality underlying the tools will help make sure these tools are of high quality every time. I've seen organizations 'fake' UCD (say they perform UCD, have a 'UX' employee, but NEVER engage a single end user!). And I can't tell you how damaging this is to UCD as a whole. It can take only one lame experience with fake UCD for an org to write it off completely. Let's raise the bar so no one can get away with faking this stuff!"
    - Respondent 121 directly addresses the believability issue expanding on the theme to suggest that all the team members should be involved in the persona/scenario creation:
        - "In order for everyone to believe in the personas and really use them, I think the research needs to be very transparent to get buy off from all the team members. They should even be involved in the research and the analysis of the data and the creation of the personas."

- *Important rating (N = 4).* Two responders with UX Centric job titles who rated transparency as important answered the follow-up query; both felt that transparency encouraged believability:
    - "It helps the team buy into the validity of the personas/scenarios. It's not just "something the UX team made up," Respondent 081.
    - "If designers understand why things are the way they are, the more likely they will be to heed them the proper respect. Saying 'its a business requirement' demands respect. So does "the research shows that..." Process reinforces all of that," Respondent 089.
- *Neutral rating (N = 2).* Two responders who gave research transparency a neutral rating discussed how transparency was related to believability; however, both suggested that design team members may not be very concerned about the underlying research:
    - "I think the design team members probably *should* care about the methods, but that they don't. They should so they have an idea of where the research came from, who was involved, etc. It would hopefully help them trust the personas/scenarios more," Respondent 101.
    - "Some members of the design team may be interested in how personas were developed; including them in the development process is helpful. If they can't attend the working groups, sending them the research methods for review is helpful," Respondent 189.
- *Unimportant rating (N = 4).* All four of the responders who gave research transparency an 'unimportant' rating also submitted a follow-up query. Three of these responses suggested that Designers did not care about the underlying research:
    - Respondent 004 not only suggests that Designers do not care about the research, but that Designers are more apt to build user stereotypes if

they are exposed only to anecdotal stories; therefore, it is detrimental to afford research transparency:

- "Nobody beyond the research team ever seems to care where the information came from. Biggest concern is if a member of the research team who only does part of the research, is also on the design team. They'll start building to suit the person they talked to, not what the final research said."

- Respondent 084 suggests that Designers only need to be aware of the fact that there was research involved but not necessarily the methods used:
  - "The one thing that is important for design teams to be aware of is the research behind personas. There is so much misconception that these are made-up, "fake" users, so it's important to let people know they are based on research, and sometimes the amount of research. However, I don't think it's important to communicate the research methods or analysis techniques."
- Respondent 082 simply felt that Designers did not care about the research:
  - "It is good to make the information available to people and let them know how it was approached, but in most situations they only care about the end result."
- One respondent (Respondent 083) who gave research transparency an unimportant consideration felt that transparency was dependent on the design team:
  - "Depends somewhat on the approach and personality of the designer/designers."

- *Very unimportant rating (N = 1).* While Respondent 095 gave research transparency a 'very unimportant' rating, her response to the open-ended question reflected that she felt transparency was important to believability:

- "As a researcher, I would want to be involved in the research process. If this is not possible, I would discredit the personas if I did not believe they were based on research."

9.3.3: Summary of research transparency

When asked directly about research transparency, it was considered 'very important' or 'important' by most (69%) of Designers survey responders. Designers who found transparency important suggested it was associated with increased believability. The only respondent who gave a reason for submitting a less than neutral importance rating suggested that she would just know if the personas and scenarios were not based in research.

In later analysis, ratings were not associated with any other designer-related independent variables (age, gender, professional experience, job title, empathy scores, HCD orientation alignment scores, and the number of projects in which personas were used). This finding suggested that beliefs about the importance of transparency are not specific to any sub-group of Designer responders.

Half of the UX Centric group (50%) also considered research transparency as 'very important' or 'important' for persona believability. Most of the respondents in this group gave the transparency of the research a less than neutral rating also suggested that Designers did not care about the underlying research. This was not consistent with the Designer response.

9.4: Research team composition/transparency

These questions expanded the idea of research transparency to include the importance of knowing the composition and experience of the research team who had created the personas and scenarios. The next sections describe the question and data analysis procedures for the responses (section 9.4.1.), findings (section 9.4.2) and a summary section (section 9.4.3).

9.4.1: Question and data analysis procedures

This question was phrased differently for the study participants than it was for survey responders. Study participants were asked first if they cared to know the background of the research group who either created: (a) the Kyrgyz personas/context scenarios; or (b) in the case of Leanne, Marco and Maria, who all had multiple past persona experiences, I asked if they had cared about the research group composition in their past experiences. Answers were coded for a binary response (i.e. care or not).

Second, I presented participants with three hypothetical research group configurations and asked participants to judge if the research groups helped the credibility of the personas and context scenarios. The three hypothetical research groups were: (1) a group led by a cognitive psychologist with a PhD and 20 years of experience in UX research; (2) a single interaction designer with a PhD and over ten years experience in design; and (3) a group of masters' students. Answers were coded for: (a) the order in which they valued the groups; and (b) reasons for the placement (i.e. education).

Survey respondents were first asked to rate "how important is it for you to know the researcher or research group's credentials, experience and/or education?"[71] Second, responders were given a space to add any thoughts they had in regards to the importance of knowing the research team's background. Survey answers were analyzed for unsolicited salient factors that respondents would want to know about the research teams.

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[71] The question wording example here is from the 'user' perspective; however, the wording was phrased differently depending on how the respondent identified their relationship to the personas/scenarios. For example, if they had identified themselves as a creator of personas the wording was "how important do you think it is for design team member to know the researcher or research group's credentials, experience and/or education?"

9.4.2: Findings

I present the findings first for the study participants (section 9.4.2.1), followed by the survey responders (section 9.4.2.2) and a summary comparing the survey respondent job title groups (Designers versus UX Centric, section 9.4.2.3).

9.4.2.1: Study participants (*N* = 10)

In the next sections, I present the conversation from each participant. Our exchange begins after I ask if they cared to know about the research group who had created either: (a) the Kyrgyz personas/scenarios; or (b) in the case of Leanne, Marco and Maria I used a past experience example.

9.4.2.1a: Leanne. Leanne was not concerned about the research group responsible for the personas that she used while with the local retailer. Additionally, she suggests that the personas were not helpful to design and had presented information that she already knew.

Cynthia	When they presented those *(the retailer's personas)* to you, you said they didn't seem to be very valuable to you, did you care about who had done the research? Or, was it something you thought about at all?
Leanne	No. I guess the only thing that I thought was should there be more coming out of it. ...But ...I felt like I, I don't know, it just should have been something more enlightening or something.
Cynthia	So, you didn't really care about who had created all that stuff.
Leanne	Not really.

When asked about the three hypothetical research groups, Leanne suggested that she was more concerned with the methods (i.e. observational methods) than she was about the research group composition. In fact, she did not differentiate among the three research groups at all unless considering methods.

Cynthia	So, if I were to say that these personas and scenarios were created by a group led by a cognitive psychologist with a PhD and 20 years of experience in user research,

	would you say that these scenarios are more or less credible? What would you think?
Leanne	...I suppose they would be more credible if there was, I guess, some ulterior way of gathering the information as opposed to just the straight feedback at the, you know . . .
Cynthia	Can you talk to me about an alternative way?
Leanne	Well, like before, you know, reading behaviors and body language and things like that. Then I would say, "yes." But, like, if they were, say, just gathering information from, like, a survey, then it didn't really matter who did it.
Cynthia	Okay. If I were to say that these personas and scenarios were created by a single interaction designer with ten years of experience in design and a PhD, what would you think? Are they credible?
Leanne	Yeah. Totally credible.
Cynthia	Why would you say that's credible?
Leanne	Oh, guess I was thinking, like, there's only...I guess it depends on how they're creating this. If they're, like, personal interviews, then I would say that the cognitive psychologist is more credible. But if they are, you know, just straight feedback, like paper, or web-based interviews, then I would say it doesn't matter. But, if it was like a . . . If you were, like, say recording songs, like actions on a screen, then I would say that the web designer user interface guy would be more credible than a PhD. ...But, did you say how these were gathered?
Cynthia	No. No.
Leanne	Okay.
Cynthia	So, if I were to say that these personas and scenarios were created by a group of masters students, will that make them more or less credible?
Leanne	I mean, same goes for . . .
Cynthia	Same goes . . . Same things...?
Leanne	Right? I don't know.....I'm assuming masters students are all very tired and they're probably overworked. So, if that means anything.

9.4.2.1b: Lucy. Lucy suggested that she did not care about the background of the researchers who created the persona/scenarios when asked explicitly:

Cynthia If you were given documents like this, would you care about the background of the creators?

Lucy No.

However, when presented the hypothetical situations, she seemed to indicate that she differentiated among the groups first by years of experience and then by educational level.

Cynthia I'm going to give three possible explanations for people who could have created these. Okay? So, if I were to say, these personas and scenarios were created by a group led by a cognitive psychologist with a PhD and 20 years of experience in user research. If I were to say, these personas and scenarios were created by a single interaction designer with ten years of experience in design and a PhD. If I were to say, these personas and scenarios were created by a group of masters students. Did any one of those sound more credible, or less credible, or are they all pretty much the same?

Lucy I think the first two were a little bit more . . .

Cynthia Why do you say that?

Lucy Well, there's obviously..The PhD is nothing to sneeze at.

Cynthia All right. That part was impressive?

Lucy Uh huh.

Cynthia All right. What about the cognitive psychologist with 20 years of experience?

Lucy That, too. That really...That tells me this is someone who knows what he or she is doing.
...Who's been in the field and . . .

Cynthia Is it the fact that it's a cog psych person or the 20 years of experience?

Lucy I think it's just the combination of both.

Cynthia All right. So, second one, if I were to say, these personas and scenarios were created by a single interaction designer with ten years of experience in design and a PhD. So, is there one or the other that you think is more credible?

Lucy Probably the cog psych with the 20 years.
...twice as much time to know what you're talking about.

Cynthia	Okay. So, the group of masters students? How do you feel about them?
Lucy	Well, not that they're necessarily that much less credible, but being masters students with no length of time of experience, I think that they would be ...If I had to choose between the three...I think they would be the last one.

9.4.2.1c: Lewis. Lewis suggested in the first part of our exchange that he would like to know who created the documents.

Cynthia	Do you want to know the backgrounds of the people that do this? If you got information on a sheet, like this, on a project?
Lewis	I would want to know the profile of the firm and, generally, the individuals that I'm hiring to do the data collection. ...Know that they're reputable...

When presented the hypothetical situations, Lewis focused on years of experience, education, and professional background all contributing to why Lewis favored the first hypothetical research group.

Cynthia	I'm going to give three examples, again, of different groups that may have created this, and I'm going to ask for your input on that. Okay? These personas and scenarios were created by a group led by a cognitive psychologist with a PhD and 20 years of experience in user research. These personas and scenarios were created by a single interaction designer with ten years of experience in a design and a PhD. These personas and scenarios were created by a group of masters students. Is there any one of those that seems more credible?
Lewis	B.
Cynthia	B seems more credible. Okay. So, let's go back to the first one. The personas and scenarios were created by a group led by a cognitive psychologist with a PhD and 20 years of experience in user research. What did you think about that?
Lewis	Oh. Yeah. I guess I didn't hear the 20 years of user research...

Cynthia	Okay. That one...?
Lewis	I like that.
Cynthia	Did that get promoted to number one now?
Lewis	Yes. Number one. ...I like that, because cognitive scientists are able to . . . analyze the... or psychologists are able to analyze why people do the things they do. ...I would actually expect more data from them. ...Based on the personality type.
Cynthia	Based on the cognitive scientist personality?
Lewis	Yeah. Scientist. Yeah. ...But I like B, because they're doing UI design. They would know what to look for.
Cynthia	Okay. And how did you feel about the group of masters students who created this?
Lewis	Masters students...would not want students to create these.

9.4.2.1d: Luke. In this exchange, Luke suggested that he would want to know the background of the research group; specifically, their experience, education and professional background.

Cynthia	If you were given information like this and asked to actually design this, given a couple of weeks to do it, lots of money, right, but you were given these documents, would you want to know the background of the researchers who created these? Would you want to know who they were?
Luke	Yeah, I would.
Cynthia	Okay. And what would you want to know about them?
Luke	I would want to know their experience, their education level, previous projects that they've worked on, you know, where their research has been used to help, maybe, successfully deploy these types of successful software programs or businesses.

However, when given the three hypothetical research groups, Luke is more impressed with youth than the factors (experience, education and professional background) he discussed in the previous section.

Cynthia	All right. I want to know if knowing someone's background would make the personas and scenarios more credible? So, I'm going to give you a couple examples. Okay? If I were to say that the personas and scenarios were created by a group led by a cognitive psychologist with a PhD and 20 years of experience in user research, does that seem like a credible background?
Luke	It does seem credible to me.
Cynthia	If I were to say that these personas and scenarios were created by a single interaction designer with ten years of experience in design and a PhD, does that sound. . . ?
Luke	Uh huh.
Cynthia	Does one sound more credible than the other?
Luke	The first one sounds more credible.
Cynthia	Okay. And if I were to say that these personas and scenarios were created by a group of masters students?
Luke	Oh, that sounds credible to me.
Cynthia	So, of those three, if you were to rank them, who would you trust the most?
Luke	The last one.
Cynthia	The group of....
Luke	It's Masters' insight. They're a little bit younger, bringing fresh ideas to the table, especially when it's dealing with technology. All the billion dollar companies are created by 20-year-olds we know now. ...So, they're kind of techy.
Cynthia	Okay. And of the second two, was there one that you thought was the second most credible?
Luke	Yeah. The first one with the experience.

9.4.2.1e: Malcolm. Malcolm appeared to associate knowledge about the research team with his personal job satisfaction and how good the research group would be at recognizing his contribution.

Cynthia	I'd like to know if the profile of the group or of the individuals within that group who created the personas and scenarios matter to you...?
Malcolm	Yeah. To me, as a designer, it matters in some sense as far as just the intrinsic motivation. And how much am I going to learn, and how much am I going to enjoy doing this design job?

> ...And, you know, also, . . . depends on ...how savvy is my client and are they going to really be able to appreciate the contribution I made? I mean, some people will look at this and they'll go, okay, thank you very much. And then some people go, oh, wow, great design job. I never though of this and that.
> ...Or, I thought of that, too. And, you know, so it matters as far as, kind of, in a human interaction sense of how rewarding it is to me to work with someone who knows what they're looking at.

In re-reading this exchange with Malcolm, it appeared as though I overwhelmed him by asking about all three hypothetical situations simultaneously. He only slightly differentiated among the three groups suggesting that the PhD level of education was an important consideration; however, he goes 'off menu' and suggests that he would prefer a sociologist with an MBA.

Cynthia	If I were to say, that these personas and scenarios were created by a group led by a cognitive psychologist with a PhD and 20 years of experience in user research. Does that make these personas and scenarios seem credible to you?
Malcolm	Yeah. ...I might forget that, but the main thing is, I'm not sure you chose the right PhD, because I'm not sure we needed a cognitive psychologist.
Cynthia	Okay. I appreciate that. What do you think their PhD should have come from? If I were to say, these personas and scenarios were created by a single interaction designer with ten years of experience in design and a PhD . . . ? Okay. And the third is, if I were to say that these personas and scenarios were created by a group of masters students . . . ?
Malcolm	You are saying a lot of things. Well, if the guy's got the PhD, then I feel that more impressive than ten masters students.
Cynthia	So, the first one was a cognitive psychologist with 20 years of experience in user research ...?
Malcolm	Yeah.

Cynthia	The second one was a single interaction designer with ten years experience in design and a PhD. And the third one was a group of masters students.
Malcolm	I'm going to answer off the menu here. ...Which is, I would be most impressed if it were designed by somebody who, let's see, an economic sociologist? ...I mean, I'm just not sure that it's the right . . .
Cynthia	That's okay... so, can you just briefly tell me why you're going to the sociologist?
Malcolm	I'm, kind of, making that up, but I'd rather, you know, a guy with an MBA. You know, come on. ...It's a business ... It's not a psychological exercise.

9.4.2.1f: Marco. In this first exchange Marco implied that he was not concerned with the background of the research team; however, he knew who the team was that created the personas/scenarios in his last experience. He had respect for the group and felt that the group had presented the personas/scenarios in an effective and persuasive manner.

Cynthia	When you are given personas and scenarios, do you want to know the profile of the researcher or the research team that came up with them? Is it important to you to understand their background to trust the data?
Marco	For me, not really. ...I think most of the researchers I've worked with, you kind of know them. ...And we know their background and we know their history, etc. And we know the process that they employ.
Cynthia	Okay. So, when you were given [persona names here], you knew who had created them?
Marco	Yeah.
Cynthia	And, so, how did they talk about how they came up with the ideas? How did you know that they spent all this time?
Marco	There was a presentation when they, you know, showed their findings. ...And they did get into that deeper level of: this is the research we did; these are the numbers of people, the patterns we saw, the assumptions we made on those patterns.

...Or the inferences.

In this exchange Marco suggested that that the keys to credibility are: (a) who funds the research; and (b) inter-rater reliability.

Cynthia	Does knowing the background of the researcher make the personas and scenarios more or less credible? For example, if I were to say these personas and scenarios were created by a group led by a cognitive psychologist with a PhD and 20 years of experience in user research. What would you think?
Marco	I wouldn't think that makes me trust it any more or less. ...I think if, you know, your research group was funded by so-and-so company, you know, I'd be a little suspect of that research. ...You know, because maybe they were just trying to sell something and maybe they hired someone to get them some credibility.
Cynthia	Okay. So, you are more suspect of the funding than of the actual research?
Marco	Yeah. I'd be more suspect of that as opposed to the actual background thing. Because, again, I don't have, you know, a frame of reference in terms of research quality.
Cynthia	All right. If I were to say these personas and scenarios were created by a single interaction designer with ten years of experience in design and a PhD. What would you think?
Marco	I would be a little suspect. ...If it's just one individual, to me, there's no . . . there's a potential . . . It's just unfiltered.
Cynthia	Unfiltered..?
Marco	Or, you know, unchecked with another, kind of, . . . just having a second opinion, I think, means a lot.
Cynthia	Okay. And if I were to say that these personas and scenarios were created by a group of masters students...?
Marco	Masters students. I would be pretty willing to accept their findings, or whatever. Yeah.

9.4.2.1g: Maria. In compiling the answers to this question, I realized that the wording I had used for Maria (as my first participant) was slightly different from how I

was phrasing the question for other participants, and may have contributed to her focus on education.

Cynthia All right. So, do you want to even know the educational background of the person who is doing these things, to believe it, or just his reputation and his past work?

Maria It seems like a lot of researchers . . . I like to be in a working situation where there are researchers, because they seem to have more expertise. And from my observation, almost all of them have either a PhD or a masters degree. It's something you assume. But when you hear, "oh, they don't have a masters degree," then it would be kind of surprising. So your just coming to the table assuming they have masters degree or a PhD. If they don't even have a BA, then they have to be, like, a major guru, or really smart.

I asked Maria to rate the believability of the research from 1-5 based on the three hypothetical research teams. She indicated that: (a) education level is an important factor; and (b) that the type of profession was important. She felt that the interaction designer would best understand how to create the personas/ scenarios.

Cynthia I'm going to just put out a couple of scenarios here. If I were to say, these personas and scenarios were created by a group led by a cognitive psychologist with a PhD and 20 years of experience of UX research, on a scale of one to five, how much would that influence the believability of these documents?

Maria Four.

Cynthia Four. Okay. If I were to say that these personas and scenarios were created by a single interaction designer with ten years of experience in design and a PhD?

Maria Five.

Cynthia Okay. Now, why is that author more valid, out of curiosity? I have the interaction designer with years of experience and a PhD, and the other author is a cognitive psychologist with 20 years of experience. Why is the UX designer, in that case, a more valid...?

Maria Oh, well, this is with the assumption that this is for an interactive product.

	...So, they have more expertise with the product, or the product type. Whereas the cognitive psychologist . . . It's hard to say. I mean, if it's just that statement, this person could have expertise with drugs, or a hospital, or a medical situation, or with the law or something. Something that has nothing to do with actual products or software.
Cynthia	Okay. If I were to say, these personas and scenarios were created by a group of masters students...?
Maria	Students that are not working professionals? ...Maybe a two.

9.4.2.1h: Heather. When asked the question about research team composition, Heather felt that knowing the educational and experience would be '*interesting*'.

Cynthia	Okay. So, do you care if you were given user information about the research group members who had created these documents?
Heather	Would I like to know about their background?
Cynthia	Yes.
Heather	I think that would interesting.
Cynthia	What would you want to know about their backgrounds?
Heather	Their education and experience in this area.
Cynthia	Okay. So, if I were . . .
Heather	Specific to this area.
Cynthia	Specific to this area? Okay. This area--user research or creating these particular documents?
Heather	User research.

Heather rated the cognitive psychologist group as her number one choice of backgrounds; however she did not include a preference until directly asked.

Cynthia	If I were to say, these personas and scenarios were created by a group led by a cognitive psychologist with a PhD and 20 years of experience in user research. What would you say about that background?
Heather	It's pretty solid.
Cynthia	Solid. Okay. If I were to say, these personas and scenarios were created by a single interaction designer with ten years of experience in design and a PhD...?
Heather	Also solid.

Cynthia	Okay. I'm going to ask you to rank these.
Heather	Yeah. I figured that was coming.
Cynthia	If I were to say, these personas and scenarios were created by a group of masters students . . . ?
Heather	That's going to be number three. ...For the purpose of the personas and the scenarios I would say the PhD, the first one. ...Yeah. That one is number one. Number two is the interaction designer.

9.4.2.1i: Hannah. Hannah claimed to want to know the research team background, but she did not elaborate on why.

Cynthia	If you were given materials like this, would you want to know the researchers' background or the research groups' background?
Hannah	Yeah.
Cynthia	You would?
Hannah	Yeah.

Given the three hypothetical research teams Hannah was concerned with: (a) educational level; (b) experience in the field; and (c) the need for a team of researchers (versus a singular person) for inter-rater reliability.

Cynthia	If I were to say, that these personas and scenarios were created by a group led by a cognitive psychologist with a PhD and 20 years of experience in user research, what would you think? Would that make them seem really valid, or you're not so sure...or?
Hannah	Yeah. I think in terms of identifying requirements, I would feel pretty comfortable. I would feel really comfortable with the cognitive psychologist researcher.
Cynthia	If I were to say, these personas and scenarios were created by a single interaction designer with ten years of experience in design and a PhD, what would you think?
Hannah	I think I would feel the same way. ...I mean . . . When you say single, it always concerns me to have just one person involved in the analysis of identifying what the requirements are. ...I feel more comfortable when you say that, you know, somebody, you know, maybe a team or whatever, at least

	two people went out and researched it. Because you always get a balance of getting different people looking at different things....counter balance.
Cynthia	Okay. So, if I were to say, these personas and scenarios were created by groups of masters students?
Hannah	Guess I wanted to know what the background of masters students, so are they students who went directly from college to masters students who have they had experience in the field?
Cynthia	Okay. Of those three groups, who were you most comfortable with receiving information from?
Hannah	Cognitive psychologist....
Cynthia	And then number two would be...?
Hannah	. . . would be the interface designer.

9.4.2.1j: Howard. Howard claimed to want to know the research group so that he could talk directly to them but otherwise he was unconcerned about the composition of the research team.

Cynthia	If you were given this as a real job, and you were given these research materials, would you want to know the backgrounds of the people who created these documents?
Howard	Well, yeah, I would like to talk with them. Sure.

I ended up not presenting all the hypothetical research groups with Howard because he asserted early in the hypothetical presentation that education were less important than experience and confidence.

Cynthia	Would knowing their background make them more or less credible? For example, if I were to say, these personas and scenarios were created by a group led by a cognitive psychologist with a PhD and 20 years of experience in user research . . . ?
Howard	Oh, like, you know, I guess I wouldn't want their resumes. I'd just want to talk with them. ...Yeah. I guess I don't get hung up on that. ... Especially this field. You get people that have been programming since they're age 12, and 10, and they've been doing it forever. Or they've been doing this kind of work for so long that they've learned a lot more than you

	could have learned going to college to learn it. So, you get people without formal education doing amazing work.
Cynthia	Right.
Howard	But then you also get people with a very formal education that . . .
Cynthia	So, you'd be more interested in what their experience was and . . .
Howard	And the quality even. Then there's the person who started programming at 10 might only be 16 now and might be quite good. ...So, I guess I'd rather just decide just from talking with them. ...Their confidence is more important.

9.4.2.1k: Summary of study participant findings on research team transparency. Most of the study participants (seven of ten) were concerned about the research team's composition when asked directly. Only two participants (Leanne and Lucy) had either: (a) never mentioned the research group in previous discussions; (b) or expressed a desire to understand the research group's composition/background. Recall that Leanne and Lucy were the two most inexperienced participants, see Table 38.

Table 38: Summary of study participant findings on research team transparency

	Concerned about the research team when asked directly	Had the participant ever bring up research team concerns earlier?
Leanne	No	No
Lucy	No	No
Lewis	Yes	No
Luke	Yes	No
Malcolm	Yes	No
Marco	Not really but he knew who the team was	Yes, when discussing his last experience
Maria	Yes	Yes, when discussing her best and worst experiences
Heather	Yes	No
Hannah	Yes	No
Howard	Yes	Yes, when discussing factors that would effect the quality of personas and context scenarios

When asked to rank the three hypothetical research teams, the cognitive psychologist team was found to be the most credible, see Table 39. Credibility was based primarily on education level and experience; however, two of the participants (Marco and Hannah) also noted that the 'single' interaction designer hypothetical was less than optimal because it was lacking a team (i.e. inter-rater reliability). Luke gave completely different reasons for his choice, preferring the masters student group because he assumed them to be younger and have the capacity to introduce a fresh approach. Only Maria felt that the interaction designer would have a credibility advantage because of previous design knowledge.

Table 39: Summary of hypothetical research team rankings

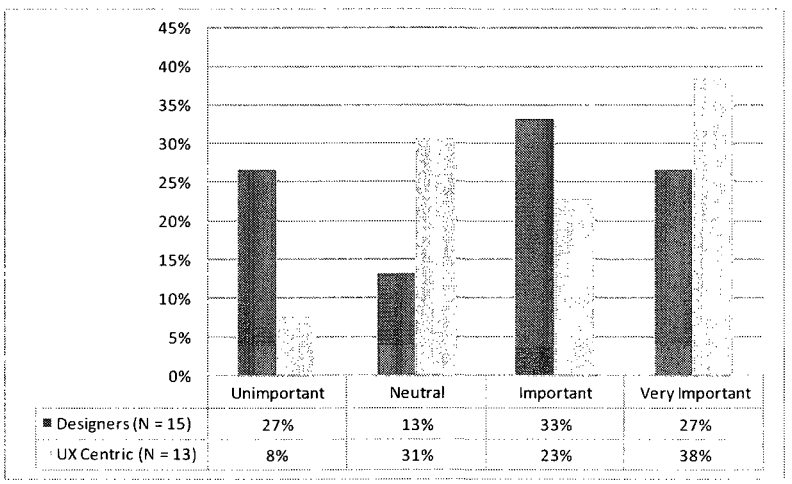
	Hypothetical research team composition ranking of credibility			
	Cog Psycologist with a PhD and 20 years experience	Interaction designer with a PhD and over 10 years design experience	Group of masters students	Concerns/ Reason for rankings
Leanne	All were credible, but more concerned about the research methods.			N/A
Lucy	1	2	3	Years of experience and education level.
Lewis	1	2	3	Years of experience, education and profession (cognitive psych preferable)
Luke	2	3	1	Younger people would bring a fresh approach (age) .
Malcolm	Went 'off menu' and made up a fourth choice.			Education level and profession.
Marco	1	3	1	Need for inter-rater reliability made the single interaction designer unattractive.
Maria	2	1	3	Education level and profession (interaction designer preferable).
Heather	1	2	3	Education level, experience and profession (cognitive psych preferable)
Hannah	1	2	3	Education level, professional experience, Inter-rater reliability (need for a team)
Howard	Not asked once it was obvious that resumes were not a decisive factor			Resumes do not matter - he would want to assess by talking to the group and gaging confidence
Totals	1	2	3	

9.4.2.2: Survey Responders (*N* = 32)

First, respondents were asked to rate the importance of knowing the composition of the research team responsible for creating personas in past experiences. Second, respondents were asked an open-ended question to add any thoughts they had about research group transparency. The next sections first present results of the ratings (section 9.4.3.3a) followed by the added comments (9.4.3.3b).

9.4.2.2a: Ratings. The question for the rating asked, 'how important is it for you to know the researcher or research group's credentials, experience and/or education?" Choices ranged from 'very important' to 'very unimportant'; additionally, responders could select a write in option which read, 'I have never thought about it before, but now that you mention it, I guess I would say..." followed by an open-ended write in field.

The two job title groups rated the importance at about the same level. Most responders from both groups (60% of Designers and 61% of UX Centric group) rated an understanding of the research team composition as important or very important, see Figure 97. Not surprisingly, there was a high correlation between the rating of research transparency and research group transparency among all responders who answered both questions, $r = .72$, meaning 52% of responders rated both at the same level of importance.



	Unimportant	Neutral	Important	Very Important
Designers (N = 15)	27%	13%	33%	27%
UX Centric (N = 13)	8%	31%	23%	38%

Figure 97: Importance of research team composition/transparency

One respondent, with a Designer job title, did not answer the rating question and three responders with UX Centric job titles chose the write in option. Respondent 069 wrote that "*it depends*," and then elaborated in the follow up question, submitting that:

- "Question of research team's background will come up when the work is not credible or the design team is not ready to buy the data. Otherwise, it shouldn't matter."

Respondent 083 suggested that Designers:

- "Should have respect and/or trust for creator."

Respondent 093 submitted:

- "Frankly I don't know if they care as long as it is presented in a fashion they are open to."

Non parametric tests were used to explore if the rating Designer responders gave to the importance of research group composition/transparency was associated with other designer-related independent variables (age, gender, professional experience, job title, empathy scores, HCD orientation alignment scores, and the number of projects in which personas were used). No patterns emerged from the data suggesting that concerns involving the research group composition/transparency are not held by any particular sub-group of Designers.

9.4.2.2b: Follow-up responses. In the next sections, I present the findings from the Designers followed by the UX Centric group's findings.

- *Designers (N = 15).* The findings about the open-ended query pertaining to transparency are presented in order of the rating the respondent gave. Not all respondents answered this query.
    - Very important rating ($N = 4$). Two Designers who rated understanding the knowledge of the research team as very important submitted responses to the follow-up question:

- Respondent 007 suggested that trust in the research group is critical to UX research being utilized:
  - "The developers have to trust the research, or they're going to ignore it."
- Respondent 071 felt that:
  - "This is important in order for the development team to have faith that the researchers performed a thorough job."

- Important rating ($N = 5$). Two responders with Designer job titles who had rated research team composition/transparency as important also wrote a follow-up response:
  - "It is important, but research methods are more important," Respondent 040
  - "I think when they know it is a human factors trained person, they are more confident about the results of the research. It's like having a CPA do your taxes when your financial picture has had considerable changes over the past year vs. trying to go it alone," Respondent 079.
- Neutral rating ($N = 2$). Both Designer responders who gave research group knowledge a neutral importance rating also responded to the follow-up query. In both cases the respondents suggest that the knowledge is dependent on other factors:
  - "It depends on how accepting the team is of the tool...if they are skeptical, credentials help...if they are believers, then not so much," Respondent 019.
  - Respondent 094 suggested that the credentials of the research team should be obvious but this would be an important consideration if hiring a team to do research, writing:
    - "Usually, I think the end product speaks for itself, you can tell if it has face validity. However, if I were contracting with a third party I would want to know

credentials, methodology and work samples before going forward."

- Unimportant rating ($N = 4$). Three Designer responders who gave research group composition/transparency an unimportant rating also responded to the follow-up query. In all cases the respondents suggested that it was the quality of the personas/scenarios that mattered and that the knowledge or experience of the research group was not an important or persuasive factor:
  - "I just need to know who the personas are, not how they were created," Respondent 009
  - "If personas are well defined, the user experience research team with a less amount of knowledge will also do a great job," Respondent 178
  - And Respondent 070 stated that, "sure it builds confidence to have well educated researchers, but in the long run you always end up knowing by the product that you get from them - it kind of becomes a moot point...my assumption is that a better product comes from a better educated group, but sometimes people can be lazy," Respondent 070.

- *UX Centric ($N = 13$).* The findings about the open-ended query pertaining to transparency are presented in order of the rating the respondents gave. Not all respondents answered this query:
  - Very important rating ($N = 5$). One respondent with UX Centric job title who rated understanding the knowledge of the research team as very important submitted a response giving a reason for his rating. Respondent 089 suggested that education is a key factor of believability when he wrote:
    - "Most of our UX people have master's degrees, so there's an aura of respect around that, and it adds credence to the project."

- Important rating ($N = 3$). Two UX Centric responders explained their ratings on research group transparency:
  - Respondent 082 suggested that research group transparency facilitated communication:
    - "Make sure the team has a chance to ask questions and feel comfortable with the process."
  - Respondent 095 felt this was an important factor affecting the credibility of the research:
    - "As the researcher, this is crucial to me. Not in terms of academic credentials, but in terms of understanding how they feel about data and how they conduct research."
- Neutral rating ($N = 4$). Two respondents who had rated the importance of research transparency as neutral completed the follow-up query:
  - Respondent 189 felt that the importance of research group transparency was dependent on other factors,
    - "It all depends on the team members. It helps if everyone (stakeholders) on the team know about each other in general."
  - Respondent 081 did not feel that research group credentials were important:
    - "I think it's the work you present, not the work you have done that counts."
- Unimportant rating ($N = 1$). Respondent 084 rated research group transparency as unimportant:
    - "This is not important at least not at my company."

9.4.3: Summary of findings on research team transparency

When asked directly about research teams, most (seven of ten) of the study participants claimed to care about the research group. Among the group that did not

care about research group transparency (Leanne, Lucy and Marco), two (Leanne and Lucy) were the most inexperienced Designers, and one (Marco) had expressed concerns about the research group in earlier conversations concerning past experiences. Important qualities of the research group included education, level of experience, profession, and the size of the research group (i.e. at least two people for inter-rater reliability).

Knowing the research group composition was not considered as important as knowing the research methods among the survey respondents with Designer job titles. Whereas 69% had rated research method transparency as 'important' or 'very important', 60% rated research group transparency as either 'important' or 'very important'. Reasons given for the importance of research transparency focused on issues of believability and credibility. Reasons given for the non-importance of transparency suggested that either: (a) methods were more important; (b) it depended how skeptical the Design team was about using personas; (c) the credibility of the end product (i.e. personas/scenarios) is dependent on the quality of the product alone.

Non parametric tests were used to explore if the rating Designer responders gave to the importance of research group composition/transparency was associated with other designer-related independent variables (age, gender, professional experience, job title, empathy scores, HCD orientation alignment scores, and the number of projects in which personas were used). No patterns emerged from the data suggesting that concerns involving the research group composition/transparency are not held by any particular sub-group of Designers.

Finally, among the survey respondents with UX Centric job titles the importance of the research group and methods were rated at about the same level; 60% of the UX Centric group rated both research method and research group transparency as 'important' or 'very important'. Reasons for a high importance included: (a) believability; and (b) an increased dialog with the design team. Reasons given for a low level of importance focused on: (a) the credibility of the end product (i.e.

personas/scenarios) is dependent on the quality of the product alone; and (b) importance was dependent on how the stakeholders viewed UX research.

9.5: Sample size

The importance of sample size was explored with both the study participants and the survey responders. This set of questions was intended to expand on the discussion of how much research methods matter to Designers. As with many of the queries related to perception-related variables, the questions were presented differently to study participants and survey responders. The next sections describe the question and data analysis procedures for the responses (section 9.5.1.), findings (section 9.5.2) and a summary section (section 9.5.3).

9.5.1: Question and data analysis procedures

Study participants were asked two questions pertaining to the importance of sample size. Participants were asked to (a) determine about how many users one should consult before creating documents like the Kyrgyz personas/scenarios, and (b) if the number of users consulted an important factor affecting persona/scenario quality.[72] Additionally, participants were asked if there were a minimum number of people who should be consulted. Answers were coded for an expressed level of importance and what numbers of sample sizes Designers thought were appropriate.

Survey respondents were also asked two questions about sample size. Specifically, they were asked 'about how many users do you think one should consult/survey/interview before creating personas (or scenarios)?' Second, survey responders were asked, "is there a minimum number of users you think one should consult/survey/interview before creating personas and/or scenarios?" Survey answers were coded for what kinds of samples sizes responders thought were appropriate.

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[72] This was a compound question that resulted in some participants focusing on the number and some focusing on the importance. In retrospect I would have asked the questions separately.

9.5.2: Findings

The next sections present the findings for the study participants first (section 9.5.2.1), followed by the survey responders (section 9.5.2.2).

9.5.2.1: Study participants (*N* = 10)

Findings are presented for each study participant (sections 9.5.2.1a-k) followed by a summary section (section 9.5.2.2j); each conversation begins after I asked the question of importance.

9.5.2.1a: Leanne. Leanne felt that the number of people interviewed or surveyed was an important factor; however, she did not have a clear idea of how many people that might entail. She suggested that since the product that study participants were asked to design was a text-based interface, the interface would be used by a wide range of people. Therefore a large sample size was needed. Her suggested sample size was between 500 and 5000.

Leanne	Sure. I suppose it would also be dependent on what the actual usage is for; for something that's as widespread as, you now, text-based cell phone use or whatever. Probably the more the better.
Cynthia	The more the better. Okay. Is there a minimum? So, if I said, "oh, these were created by consulting two people" or "these were created by consulting 3,000 people," is there kind of a threshold in there where it doesn't matter anymore?
Leanne	Oh, I see. Yeah, I mean, probably going past 5,000 or maybe.... it's kind of hard to comprehend....
Cynthia	Okay. What about a minimum?
Leanne	Maybe 500.
Cynthia	500. Okay. There's no right or wrong here. We are just trying to get a feel for it...so your minimum number is around 500?
Leanne	Yeah

9.5.2.1b: Lucy. Lucy suggested that the sample size was less important than the quality of the sample. Lucy suggested that five or ten people would be an adequate sample size.

Lucy	Yeah. It matters in the sense that you wouldn't want just to ask one person what they thought. ...But, I think the numbers aren't really as important as long as, I mean, you get a good variety of people from different backgrounds and different approaches.
Cynthia	Okay. So, for one of these, ten people would be enough? Five people would be enough? A hundred people?
Lucy	A hundred people would be . . . Well, I mean, that would be getting . . . Doing that, you'd have a good view of how the group would approach something. But, I think you could do it with five or ten.

9.5.2.1c: Lewis. Lewis immediately honed in on a sample size of 500, suggesting that it would facilitate a wide range of users from which to create the personas and scenarios.

Lewis	I would say 500 people, I guess.
Cynthia	Five hundred? Okay. Is that a minimum number you think?
Lewis	Yeah.
Cynthia	Okay. And why does that number come to mind?
Lewis	Because it gives you a broader prospectus on people who are living in the city or in the country, and from different socioeconomic levels, so that you can understand how people use a product you're trying to build, and how you can do your advertising and pricing structure so that it's equitable for them.

9.5.21d: Luke. Since Luke had generated sample size as a factor when asked to describe factors that would affect the quality of personas and scenarios, I asked him about sample size as part of that conversation rather than asking later; however, recall that Luke's interpretation of sample size was the number of actual personas. In the entire exchange, Luke suggests that an ideal sample size of people to consult would be 500.

Cynthia	Can you tell me what factors you think would affect the quality of documents like this?
Luke	The sample size. ...Because there are only three that I'm looking at right now, I would probably like to see an entire chart of just numbers dealing with a larger sample size. ...I don't need to look at just one person, I want to see what a 100 or a 1,000 people are seeing.
Cynthia	Okay. And is there, like, a minimum number; a minimum sample size that you think someone should consult before they create a document like this?
Luke	I think probably . . . A population of five million . . . I think five hundred would be ideal.

9.5.2.1e: Malcolm. I am not completely sure that Malcolm understood what I was asking. While he did not find sample size an important factor in the credibility of personas and scenarios from a design perspective, he suggested that sample size was important from an investment perspective.

Malcolm	Yes. Sample size.
Cynthia	Does that matter? Does sample size matter to you?
Malcolm	If you were asking me to invest money . . .
Cynthia	Thinking from a designer's perspective, not from an investor's perspective, how many, people should be consulted? Is there a minimum number?
Malcolm	As a designer?
Cynthia	Yeah. I mean, it's okay to say I don't know...
Malcolm	I'd say, you know, this is pretty darn credible. As from a designer's standpoint, I was able to build up, I think, a pretty robust design. ...The business standpoint is totally different, because I'm going to want to know, you know, this market is . . . We expect the market to be one tenth of the population of the country of . . . Well's there's five and a half million people, so we're going to get five hundred and fifty . . . We're going to have 500,000 subscribers, and they're going to, you know, and they're the whole profit.
Cynthia	If you would have been hired as a designer and you were to get these, you're not really that concerned about how many people were consulted to create these documents? Is that what I am hearing?

Malcolm Yeah. Because I'm getting paid whether you've really fully done your homework or not.
...And my degree of commitment is relatively low.
...I mean, you're asking me to do, you know, $100 of work, or whatever, and I'm getting paid.

9.5.21f: Marco. Marco felt that sample size was an important consideration in the research for creating personas and context scenarios; however, he felt that it was not important for the sample size to be communicated to him since he did not have the proper knowledge to assess what would be an adequate number.

Marco I don't think it's that important....?
...Because from what I understand, you know, you don't really need to ask a lot of people the same sort of questions.

Cynthia And, so, you say not very many people. What's kind of your ballpark on how many people?

Marco Well, that's exactly my point.

Cynthia Yeah.

Marco You know, if I hear a thousand, I'm not going to say: oh, yeah, 1,000. That makes sense.
...I don't know.
...I'm going to assume the people that are doing the survey know when they've hit a certain good spot.
...But I think it's good to have those kind of numbers available if people start getting really inquisitive. Like: how many people did you really ask? And, if you say, you know...That's why it's good to not actually have it in the persona, but it's good to have that around as background.

Cynthia All right. So, there's no number that you trust or distrust?

Marco Yeah.

Cynthia If someone said, "I consulted two people," you would say, "fine." If I consulted 900 people, fine. There's no real . . . ?

Marco Yeah. Yeah.
...Well, I mean, two people, I might be, like, "really?" Is that enough to draw a conclusion?

Cynthia So, somewhere there is a minimum.

Marco Yeah. But I don't know what it is and, you know. I think a researcher would be able to tell me that I'm wrong and I would have no way to say anything about it.

9.5.2.1g: Maria. Maria suggested that sample size was dependent on the project. She does not feel that large sample sizes were important and submitted that good data could be achieved with as few as two participants if the research took a deep approach.

Maria It depends on the project.
...For instance, I was privy to this ethnographic research where they really studied two people. Two people who were really . . . They were sort of like this person, but in California, where they follow these two people like, you know, for a few weeks, following their interaction and understanding their behavior, how they interact with friends. That is really good. But with 20 people, of course, you're not going to follow them for two weeks. You don't have the budget.
...Yeah. So, less is okay, but you have to have, like, a focused, more in depth . . .

Cynthia In depth. If you have less, it has to be more in depth.

Maria Yeah. I think it would have to be pretty unique.

Cynthia Okay. All right. That's good feedback. So, you would say there's no real minimum number? You would say it's just the interaction between depth and . . . ?

Maria Yeah. . . . and number.

9.5.2.1h:Heather. Heather's response was complex. She suggested that the required sample would be smaller in Kyrgyzstan than it would be in the United States because the variety of users would not be as broad; this implies a possible stereotype that she had about Kyrgyz mobile users. Heather's sampling plan was detailed. She suggested that first she would determine the major segments (although she did not explain how this might be done) and then interview four to five people per segment. However, she added that more people per segment would be needed in the United States because there would be more variety in the segments.

Heather Here or in Russia?

Cynthia In Russia. In Kyrgyzstan. Yeah. Or, if it was here. .

Heather I think there would be a difference.
...Because in the United States, what is the percentage of people who own cell phones right now?

Cynthia It is pretty high.

Heather About 87%, 92%. It's way, way, way up there?

Cynthia Yeah. Yeah.

Heather And in Russia, I'm guessing it's not anywhere near as high.

Cynthia It's getting up to the 75%.

Heather It is?

Cynthia Yeah.

Heather But remember they've never had landlines. So most of them have never had landlines, which is just amazing to me. And, so, this is actually good, because it has three different profiles. I think the other profile I'd like to see here is if there are major businesses, a major business owner as well.

Cynthia Okay. So, you don't really have any . . .

Heather Numbers?

Cynthia Yeah.

Heather I don't know. I guess to determine numbers I would want to look at what I think the major groups would be first.
...And maybe within each group I would want to have interviewed four to five people.

Cynthia Okay. So, you think consulting about four to five people per . . .

Heather ...per group.

Cynthia ...per group?

Heather Whatever, you know, we determine from research the major groups. Because we've got a young student. We've got a very small business owner. We've got a very isolated housewife.
...And, as I said, there could be a larger business owner. There might be...I don't know if they even have grocery stores over there. But that could be a grocery store or . . . I don't know. You know?

Cynthia So, you said that there was a difference that was dependent on where the documents were created. If you were creating these documents in the United States,

would you need four to five people per group? More or less than that?

Heather In the US I would probably say just a few more.

Cynthia A few more.

Heather Maybe eight to ten.

Cynthia Okay. And why more in the US? Can you explain that to me?

Heather I think that you would get a better cross-section, because- if it's a cell phone project-people use their cell phones for all different things.
...And I may use mine totally differently than someone else, but we would both work in the same business, for instance. Just as a personal thing.
...I do not want my email trailing my ass when I walk out of work on my cell phone.

Cynthia I understand.

Heather It can wait until I get to the computer.
Some people, my God, it has to be every single second.
...So, I'm not a big Twitter user.
I could care less. You know, stuff like that that just trails you around and drives you nuts, I'm not interested in.
...So, there could be a graphic designer whose hooked 24/7. There could be someone like me, whose hooked when I'm in front of the computer, and my cell phone sits beside me to get my calls. There could be someone who is somewhere in between that there could be a whole different array of people who work in the same field who use their phones much differently. And, so, if you were going to set up a system like this, you'd have to consider all those different end users.
...And I think you'd need a bigger sample group.

9.5.2.1i:Hannah. Hannah also did not directly address the importance of sample size and used a similar sampling method as Heather. She referenced the three personas that were given and suggested that felt 10-30 people should be consulted per segment.

Hannah There's no magic number..? *(laughs)*

Cynthia Yeah.

Hannah	Yeah. Geez. I don't know. I would say at least, maybe, ...I mean, you're saying, like, a group of people you would consult before you got to this point?
Cynthia	Right.
Hannah	Oh. Okay.
Cynthia	You've got your interviews, surveys, focus groups. I mean, how many people do you think that you should have to go see and talk to?
Hannah	And that is to be able to create these three different distinctions? *(gestures to the personas).*
Cynthia	Right.
Hannah	Goodness gracious. I'm going to just say ten.
Cynthia	Okay. Ten for each or ten total?
Hannah	Well, ten total. ...On the idea that you, kind of, start to see, maybe, a breakout.
Cynthia	Okay. And is there a minimum number? Is that the minimum number?
Hannah	I would think . . . Yeah. That's the minimum number.
Cynthia	Okay. And is there a maximum number? I mean, do you think a thousand's too many?
Hannah	Yeah.
Cynthia	So, what would be the maximum?
Hannah	It would be, like, 30.

9.5.2.1j: Howard. While Howard clearly thought that sample size was an important factor, he was reluctant to determine what the 'correct' sample size might be due to his lack of statistical knowledge. In this exchange he implies a fairly sophisticated understanding of sampling size by referring to item response theory.

Howard	Oh, it most certainly does. Yeah.
Cynthia	So, how many people do you think someone should have to go interview, or consult, or survey? Is there a minimum number?
Howard	Well, I guess that's an item response theory question. I do not have that statistic book memorized at all. I think you would have to have some sound statistics. ...I couldn't...any number I said would be wrong. ...Because it won't have any basis.
Cynthia	So, you would want to figure out an effect size...?
Howard	Yes.

9.5.2.1k: Summary about perception of sample size among study participants. Study participants were first asked to reflect on (a) how many people one should consult before creating personas and context scenarios and (b) if the number of people was an important factor affecting the persona/scenario quality. (This was a compound question that resulted in some participants focusing on the number and some focusing on the importance. In retrospect I would have asked the questions separately). Second, participants were asked if there was a minimum number of people that should be consulted. Answers were coded for an implied level of importance and what kinds of sample sizes Designers thought were appropriate.

Five participants (Leanne, Lucy, Malcolm, Marco and Howard) focused on the importance aspect of the first question. The two most inexperienced participants (Leanne and Lucy) suggested that the number of people consulted was an important factor affecting quality. Malcolm, Marco and Howard all suggested that sample size was important, but that as designers they did not need to know what that amount was nor did they feel competent to estimate an appropriate sample size, see Table 40.

For the six participants who ventured an estimate on sample size there was a difference of perception that roughly followed experience level. The three inexperienced designers, Leanne, Lewis and Luke all suggested a sample of 500 would be appropriate; conversely Heather and Hannah suggested smaller sample sizes. Lucy was the only inexperienced designer to suggest a smaller sample size. Further, Leanne and Lewis both had suggested that interviews or observational techniques would be the best methods to conduct the research; as such, these two participants did not consider the implications of a larger sample size.

Table 40: Summary of sample size findings among study participants

	Sample size important?	Suggested sample size
Leanne	Yes	500
Lucy	Yes	5 to 10
Lewis	Did not say	500
Luke	Did not say	500 for a population the size of KG
Malcolm	Yes, but not important for designers to know	N/A
Marco	Yes, but not important for designers to know	Did not feel competent to guess
Maria	Did not say	Depended on the project and research type
Heather	Did not say	4 to 5 people per segment in KG
Hannah	Did not say	10 to 30
Howard	Yes, important to the quality but did not say if it was important for designers to know	Did not feel competent to guess

9.5.2.2: Survey respondents (*N* = 32)

Survey respondents were also asked two questions about sample size. First, they were asked 'about how many users do you think one should consult/survey/interview before creating personas?' Responses included: (a) less than five; (b) more than five but less than 15; (c) more than 15 but less than 50 (d) more than 50 but less than 100; (e) as many as possible; (f) I do not know; and (e) a write in option that said 'it depends on many variables and those variables include'...(write-in option). Second, survey responders were asked, "is there a minimum number of users you think one should consult/survey/interview before creating personas?" Responses included: (a) no; (b) I do not know; and (c) yes, and that number is... (write-in option). All survey answers were coded for what kinds of samples sizes responders thought were appropriate. In the next sections, I present the findings from respondents with Designer job titles, followed by those with UX Centric job titles, followed by a summary section.

9.5.2.2a: Designers (N = 16). In this section, I present the findings first from those Designers who gave a specific number (*N* = 10) followed by those who either did

not know or gave a relative answers (i.e. it depends, $N = 6$). The answers for both survey sample questions are combined.

- *Designers who gave specific sample sizes ($N = 10$).* Designers who gave specific sample size amounts varied in their estimates from 'less than five' to 'as many as possible':
    - *Less than five ($N = 1$).* Respondent 178 was the only Designer respondent to identify a sample size of less than five; in the follow-up question asking if there was a minimum, he chose the '*I do not know' response.*
    - *More than five but less than 15 ($N = 3$).* Of the three respondents who identified a sample size between five and fifteen, two chose the '*I do not know*' in the follow up response asking for a minimum (Respondents 104 and 094).
        - Respondent 132 felt that the minimum number was five;
    - *More than 15 but less than 50 ($N = 3$).* Of this group, Respondent 127 selected the '*I do not know*' for the minimum number:
        - Respondent 070 wrote that the minimum number was 25
        - Respondent 180 identified a minimum number of ten.
    - *As many as possible ($N = 3$).* All three of the respondents who felt that the correct sample size was '*as many as possible*' also suggested a minimum number:
        - Respondents 040 and 184 suggested a minimum of ten
        - Respondent 077 estimated a minimum of eight participants would be needed to create a set of personas/scenarios.
- *Designers who did not give specific sample sizes ($N = 6$).* Two Designers who did not give specific sample sizes chose the '*I do not know*' option (Respondents 009 and 007). Four Designers chose the write-in answer and

suggested that sample size was dependent on the size/variability of the audience. The respondents wrote that sample size depended on the:

- "...on the audience base; if the product/service is being designed for all age-groups, demographics, etc," Respondent 079
- "...size and scope of project and number of users," Respondent 085
- "...the size and/or variability of the intended user," Respondent 071
- "...complexity of issue, size of target audience," Respondent 019.

9.5.2.2b: UX Centric (N = 16). In the next section, I present the findings first from respondents with UX Centric job titles who identified a specific sample size (*N* = 7) followed by those who either did not know or gave a relative answers (i.e. it depends). The answers for both survey sample questions are combined.

- *UX Centric responders who gave specific sample sizes (N = 7).* Respondents with UX Centric job titles who gave specific sample size amounts varied in their estimates from 'more than five but less than 15' to 'as many as possible':
  - *More than five but less than 15 (N = 4).* Of this group, Respondent 048 was the only one who did not identify a minimum number:
    - Respondents 101 and 069 identified the minimum sample size number as five
    - Respondent 081 identified the minimum number as three.
  - *More than 15 but less than 50 (N = 2).* In this group, Respondent 082 did not identify a minimum number:
    - Respondent 121 suggested that the minimum number was ten.
  - *As many as possible (N = 1).* Respondent 004 felt that the ideal sample size was a many as possible and suggested that a minimum number was ten to twenty participants per persona type.
- *UX Centric responders who did not give specific sample sizes (N = 9).* Among the group who gave relative answers, only Respondent 189 selected the 'I do

not know' option; the remaining eight chose the write-in dependent answer. Similar to the dependent answers given by the Designer group, the most common dependency was the size or variability of the intended end user audience:

- Respondent 050 wrote that the minimum sample size was about twelve and depended on the
  - "...size of user base; breadth of software functions and 1 use cases; research budget!"
- Respondent 084 also identified a minimum number of twelve and felt that sample size depended on the
  - "...size of website/application, complexity of website/application, size of user base, homogeneity of user base, geography of user base."
- Respondent 083 identified a minimum number of three participants and submitted that sample size depended on the
  - "...scope, complexity, existing research."
- Respondent 093 wrote that the minimum number was three to four users per group and suggested that sample size depended on the
  - "...users/audience of the system."
- Respondent 076 identified a minimum number of three participants and that sample size depended on the
  - "...number of unique user groups identified."
- Respondent 022 did not suggest a minimum number and submitted that sample size depended on the
  - "...expected number of users of site."
- Respondent 089 did not suggest a minimum number and suggested that the sample size depended on the

- "...breadth of audience."

- Finally, Respondent 095 also did not suggest a minimum number and felt that sample size depended on the
  - "...diversity of the user group."

9.5.2.2c: Summary of sample size findings for survey respondents. While Designers were more likely to identify a sample size when compared to UX Centric responders but the UX Centric group was more likely to identify a minimum sample, see Figure 98 and Figure 99. The most common sample size chosen by the groups combined among those who identified a specific number was 'more than five but less than fifteen'.

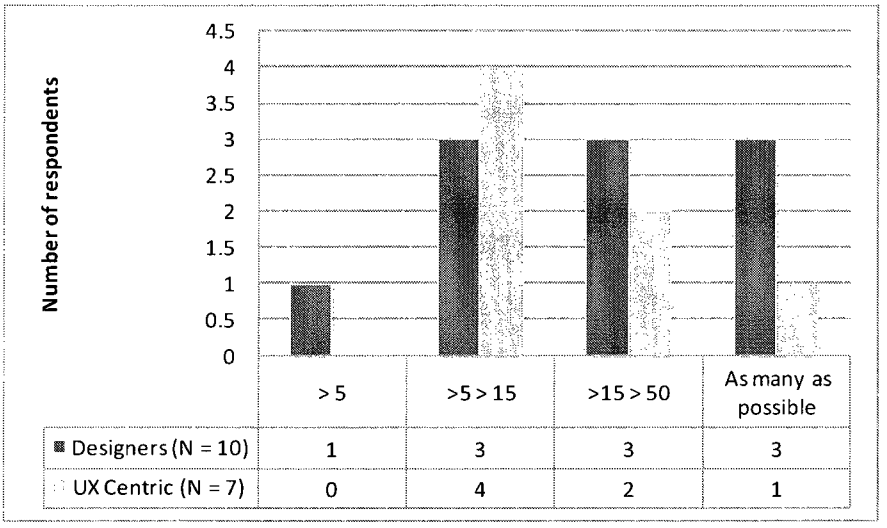


Figure 98: Sample size estimates from survey responders

Among the Designers who suggested a minimum sample size ($N = 6$), the mean suggested number was 11.3. Conversely, among the responders with UX Centric job titles who identified a minimum sample size, the mean suggested number of participants was about 7.1. Combined, these findings suggest, among those Designers who had a specific sample size in mind their estimates were generally higher compared to the UX Centric group.

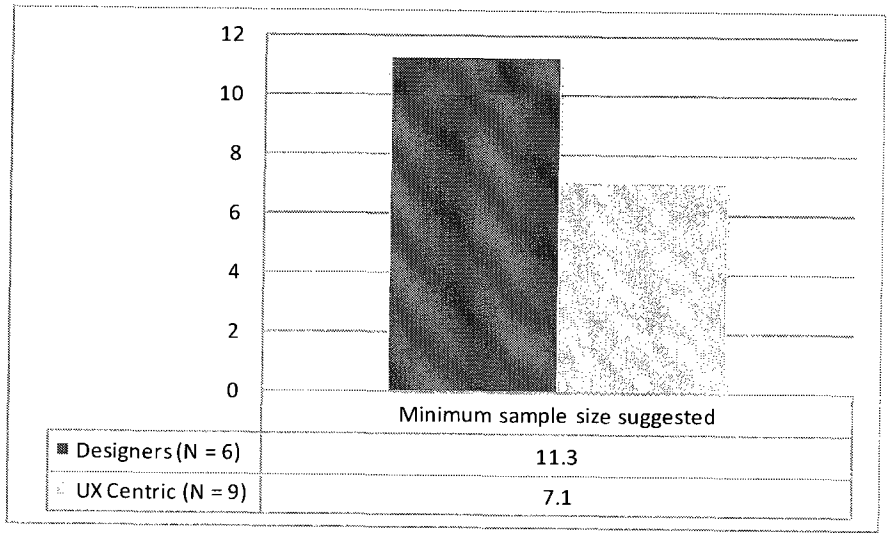


Figure 99: Minimum sample size estimates from survey responders

Many respondents selected the write in dependent answer (Designer $N = 4$, UX Centric $N = 8$). Most included a reference to sample size dependent on the size or variability of the intended audience (Designer $N = 4$, UX Centric $N = 7$). The complexity and scope of the project was also a commonly identified dependency (Designer $N = 1$, UX Centric $N = 3$).

9.5.3: Summary: sample size

Among the Designers who did identify a specific sample size the most common range was more than five but less than fifteen (identified by three survey respondents and was the approximate range identified by Lucy, Heather and Hannah). Designer respondents and study participants estimated that the minimum required sample size should be about eleven participants. UX Centric survey responders estimated that fewer participants would be needed; that the minimum required sample size should be seven participants according to the UX Centric responders.

When isolating the Designer group ($N = 26$), there were two variables that appeared to be related to whether a sample estimate was given. I first split the group into those who gave specific estimates ($N = 16$) from those who did not ($N = 10$). There was a significant difference found in the willingness to give a specific estimate and the

level of professional experience, $U\,(N = 26) = 40.5$, $Z = -2.24$, $p < .05$. The average level of professional experience among the group who gave estimates was less (five to seven years) than those who did not (seven to ten years). Additionally, solution-driven participants and responders were more likely to give estimates, $\chi^2\,(1, N = 18) = 4.22$, $p < .05$. These associations suggest that when dealing with more experienced Designers it may be more important to explain sample size dependencies.

The most identified dependency among the combined Designer group for sample size was the size and/or variability of the end user audience. This dependency was identified by Luke, Heather, Hannah and four survey respondents. This finding suggests that when discussing sample size dependency with Designers, the size and variability of the end user audience are salient concerns.

9.6: Presentation

Questions about the display, content and quality of personas/scenarios were meant to better understand what Designers perceived to be effective presentations. In the next sections, I describe the question and data analysis procedures for the responses (section 9.6.1.), findings (section 9.6.2) and a summary (section 9.6.3).

9.6.1: Question and data analysis procedures

Questions pertaining to presentation modes were phrased differently to the study participants and the survey responders. For those two participants (Marco and Maria) who had discussed multiple past persona experiences, I began the conversation by asking them to focus on presentation modes of their past experiences. For all remaining participants, I asked how they felt about the presentation of the Kyrgyz personas and scenarios, and then to reflect on ideas regarding more effective modes of presenting personas and context scenarios. Additionally, for those participants without multiple past experiences, I presented up to three hypothetical presentations of personas and asked if they thought any of the hypothetical situations would be effective. The three hypothetical presentations were: (1) a dramatic short play; (2) life

size posters; and (3) action figures.[73] Up to two hypothetical situations about scenarios were also presented: (1) visual storyboards; and (2) a video with actors.

Conversations were coded for: (a) suggested changes to the Kyrgyz personas/scenarios (or in the case of Marco and Maria suggested approaches that worked well or not in the past); and (b) impressions of the hypothetical presentations that were discussed.

The survey asked respondents three questions pertaining to presentation. (1) How have personas (or scenarios) been presented to you in the past? (2) Describe how effective you feel the presentation methods you listed above were to your understanding of the personas (or scenarios)? (3) How do you think personas (or scenarios) should be presented to design team members to maximize their effectiveness? Answers were analyzed for: (a) common formats; (b) positive or negative feelings about formats; and (c) recommendations pertaining to formats, details and other common recommendations.

9.6.2: Findings

In the next sections, I present the findings for the study participants (section 9.6.2.1), followed by the survey responders (section 9.6.2.2).

9.6.2.1: Study participants (*N* = 10)

In the next sections, I present the conversation from each participant (section 9.6.2.1 a-j) followed by a summary (section 9.6.2.1k).

9.6.2.1a: Leanne. I began the exchange about presentation with Leanne by referring to the last time she used persona-like documents as part of her job as a developer with the retailer. Recall, that she had brought up the presentation herself as part of the past experience discussion and suggested that: (a) the presentation was very slick but had not contained helpful material; and (b) that she perceived the slick

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[73] These three modes were chosen because they were some of the alternate modes of presentation suggested in the literature.

presentation as an indication that the organization was supportive of the effort. In this first exchange, Leanne is clearly unimpressed with the Kyrgyz persona and scenario presentation.

Cynthia	You were talking a little bit about the presentation you got at the [retailer name], where the presentation was a green card and there was all this other stuff. First, how did you feel about this particular presentation?
Leanne	Yeah. I felt that this was, I mean, I guess, presentation-wise it would have been more professional ...maybe...? ...Like this photography is not that good. *(She is pointing to the photographs of the Kyrgyz personas)* ...And it looks like an email. ...It looks very buggy. *(The printouts had artifact lines from the printer. Because Leanne made a comment about this I made sure that the lines were on every set of personas that the participants used.)* ...I like the layout...it is at least easier to read than the..... *(Point to the detail sheets).* ...I actually had to follow the little lines with my pencil *(She is referring to the detail sheets in which there were connector lines from each data point to where they were conceived from the data).* ...Yeah. I felt that this was too much....oh, I did not even realize until now that this was a detail of this *(pointing to the persona).*
Cynthia	So, the fact that it wasn't printed on the greatest paper and the fact that there are these artifacts on the bottom is unimpressive?
Leanne	Yeah. ...And, just like the way that the photography looked bad or . . .the artwork looks bad.
Cynthia	Okay. The artwork looked bad.
Leanne	But it could be because of the printing. I'm not sure. ...This one does not look so terrible *(Roza's persona sheet did not have as many of the printer artifacts).* I mean, it's the lighting or something.

Next, I ask Leanne about suggestions to improve the presentations. She focused on paper size, layout and the need for a better visual of a phone with Russian letters. The last point focused on the relationship between a distant audience and how UX

researchers might want to consider different types of content (i.e. pictures of phones) when presenting UX information about a distant audience.

Cynthia	What do you think would be an effective way to present these? If someone put you in charge of the next project and said, you know, tell us how you think a real effective way of presenting personas and scenarios might be?
Leanne	Well. Let's see. I guess I would maybe even choose like a different paper size. ...Because, somehow, when I am presented with an 8.5 x 11 paper, I can't focus on it, because it seems like it's, like...being at work. .....So, maybe just having it like in just more unique shapes with less information on each piece. ... That would be good. And, like, kind of strange the way that this is laid out. You know the interactions to look like an afterthought... *(She is referring to the scenario presentations in which I placed the scenario text in the same column backgrounds as the personas so that neither stood out as visually dominant)*...because it doesn't have some part of . . . doesn't have any specific background or anything like that. They're just not equal *(the columns were unequal)*. And, I mean, I guess it would be great if there was some kind of visual of... *(At this point she is pointing to the telephony information sheet in which there was a line drawing of an older mobile phone. Recall that the line drawing was presented to participants to help them understand the type of phone interface that I had wanted participants to focus on during the task)*... like, more of a visual than this for a phone.
Cynthia	Okay. This just didn't do it for you?
Leanne	Well, I mean, no. I got my own phone out, is what I did, to see, like, you know, what options a person has with texting...like what symbols are available...and then I have no idea if all of the phones only have the English or whatever, alphabet.

I only presented one hypothetical presentation to Leanne because she immediately shot down the life-size poster idea (the least gimmicky of the three hypothetical

presentations). In addition, because of her previous expressed distaste for the glossy images presented by the retailer I did not ask about the hypothetical scenario presentations.

Cynthia	So, we talked a little bit about more unique paper shapes. What would you think if they were, like, life-size posters?
Leanne	Yeah. I think that would be overkill.

9.6.2.1b: Lucy. Lucy felt that the presentation was somewhat effective and focused her critique on the content. A familiar theme in these exchanges was a desire to see all three personas on one sheet for comparison (three participants discussed a way to facilitate comparisons).

Cynthia	I want to talk a little bit about the presentation. In this case, this information was given to you on single sheets. How do you feel about this presentation?
Lucy	I think it's pretty effective. There is a lot of text . . . . . to go through. I almost would prefer that you could fit everything onto one sheet. *(Meaning all the personas on one sheet).*
Cynthia	Can you expand on that... do you have any ideas on really effective ways to, maybe, convey this type of information?
Lucy	I don't know. I'm looking at this and trying to figure out how I would.
Cynthia	Yeah. If this was a design problem that was given to you...how to effectively give somebody this information. What would you do?
Lucy	Yeah. Well, I would have to . . . I guess, ultimately it would depend on how much time you were going to spend looking at it. I would be happier if there was just . . . if you could look at it and instantly see what's the important stuff, or what do *I* really need to know.
Cynthia	What on here did you really need to know?
Lucy	Well, I feel for me, for working on this problem, interactions were most useful....and the goals too. *(She was pointing to the prose sections of the personas).* ...And I think these are case studies of people, so...I almost feel like I don't need as much of the personal

information. *(Pointing to the bulleted list section of the personas).*

Cynthia What information was not important?

Lucy Well, I didn't even look at the technical information.
...I looked a little bit at mobile phone length of use. I didn't even look at that. I saw how often does he use it, and what does he use it for?
...And I saw his *(meaning Parxat's persona)* age, profession, income, schooling, and language.
...Yeah. I didn't even . . . I don't think I even looked at technical information for the other people.

Lucy was presented with all the hypothetical situations for the personas. None were of any particular interest; however, she found them humorous.

Cynthia What if these people were presented to you in a dramatic short play? Would that do anything for you at all?

Lucy *(Laughs)* I would probably laugh.
...Yeah. I don't . . . I think it's better to have it . . . For me, personally, I'm very visual.
...But I need to have it right out in front of me. I don't think I'd be able to get as much out of not being able to see it in words.

Cynthia By visual...do you think that maybe some more graphics, rather than textual . . . ?

Lucy I don't know that you need graphics.
You could, I suppose, but I'm not . . . I wouldn't . . .

Cynthia Okay. So, what if these were life-size posters?

Lucy *(Laughs)* That would be a little intimidating.
...Just because there would be so much of it and it would be so big.

Cynthia Okay. What about action figures? Parxat action figure.

Lucy Oh, that's funny. I'm not sure how useful that would be.
...But it would be entertaining. I would certainly remember the people.

When asked about the storyboard option for context scenarios, she was quite enthusiastic.

Cynthia Okay. That's good to know. What if the scenarios were presented through storyboards? Like how you see for movies...when they storyboard scenes?

Lucy	Yes. And that would be perfect. That's actually what my degree is in.
Cynthia	Oh, really? Awesome. And you think that would be effective?
Lucy	I think it would be very effective, because then you'd have . . . Yeah. You would have . . . Not only would it be broken up into smaller chunks, with very manageable information, but you would have the textual and the visual reinforcement of the idea. ...I think it would be great.
Cynthia	What about in a video with actors showing them, you know, doing these things through a video?
Lucy	I think it might work for some people. It wouldn't work for me. ...Because I can't focus on film.

9.6.2.1c: Lewis. Lewis wanted a way to contain all the documents in an organized manner and suggested a binder. Like Lucy, he wanted to enlarge the sheets so that comparable information could be presented together which would eliminate the need to move from persona to persona to find comparable data.

Cynthia	I want to know if the presentation of these types of documents matter to you. How did you feel about this presentation? They were given to you on single sheets.
Lewis	Well, it probably would be easier in a binder and all color-coded. ...I think it is all messed up the way it is right now.
Cynthia	Okay. Besides the binder, do you have any ideas on more effective ways about presenting data like this that would be more effective for you?
Lewis	Well you could do an 8 by 14, or bigger sheets that contain all these documents on the same page. ...And were clearly marked as pages or whatever. ...So that I could just look at a person.

Lewis was not at all impressed with any of the hypothetical persona presentations.

Cynthia	All right. If these personas, let's say, were presented to you through a dramatic short play, would that do anything for you?
Lewis	No.
Cynthia	No. What about through life-size posters?

Lewis	No.
Cynthia	Okay. Action figures?
Lewis	Nope.

Conversely, the visual storyboards seemed like they might possibly be helpful; however, he remained somewhat skeptical about their use. The idea of a video with actors was not something Lewis felt would be helpful.

Cynthia	What if the scenarios were presented through visual storyboards? Like what they do for movies.
Lewis	It can help me, because I'm a visual person, but I can read this stuff and make my own visual perception of it....maybe.
Cynthia	What if these little interactions were . . . scenarios were shown as a video with actors?
Lewis	No...waste of time.

9.6.2.1d: Luke. While Luke did not have any negative things to say about the presentation of the Kyrgyz personas and scenarios, he suggested that a video might be more effective. However, he implied that it was not the persona he wanted to see interviewed, but an actual person, so he would have access to the raw data. This also implied that Luke may have not understood that the persona was a rolled-up summarization of data from multiple users.

Cynthia	In this case you were given single sheets and some backup stuff. How did you feel about the presentation of these documents?
Luke	I liked it. It's very organized. ...And then, I like how these are the three main, I mean, motivations for people to use this software system. And I think that's important. You need to be able to target, okay, how is a practical person going to use this? How is a social person, who's in probably the younger generation . . . ? How is just somebody who is a housewife can use this? And then, this is pretty interesting, too. I didn't really get a chance to read through it, but I like how it really backs up how every type of data was retrieved. *(Referring to the detail sheets).*

Cynthia	Can you think of a more effective way that these documents could be presented?
Luke	Probably ....a video.
Cynthia	A video?
Luke	Yeah. ...So you interview them and put all the data down, so that you can always access it at any time. ...But I would like to see how he *(Parxat)* personally is responding to these questions. ...Because non-verbal communication is just as effective as just facts on a paper.
Cynthia	Okay. So, if you were to do a video of, let's say, Parxat, would you interview him and videotape that?
Luke	Uh huh.

When presented the hypothetical presentations, Luke was only encouraged about the scenarios communicated through visual storyboards.

Cynthia	For example, the personas were presented through a dramatic short play, do you think you would get anything out of that?
Luke	Like, what do you mean by a dramatic short play? ...Like a reenactment of....?
Cynthia	Like, some guy came in and said, I'm Parxat and this is what I do.
Luke	Oh. No.
Cynthia	Okay. What about life-size posters? If things were blown up into life-size posters, do you think that would be an effective presentation for you?
Luke	It wouldn't be necessary.
Cynthia	Okay. What if the scenarios were presented through visual storyboards?
Luke	Yeah. That would be better.
Cynthia	Okay. And when I say visual storyboards, what do you picture in your head?
Luke	PowerPoints.

9.6.2.1e: Malcolm. Recall, that earlier Malcolm had suggested that some of the persona information be presented more graphically and combined so that it was easier to make comparisons. He did not choose to expand on these ideas; instead, he

suggested that he would have liked to have received the research documents prior to the study.

Cynthia	In this case you were given single sheets with the personas and the scenarios....and you talked *(earlier)* a little bit about that you wanted more charts and graphs. Can you talk a little bit more about how you felt about his particular presentation? What other ideas do you have on more effective presentation?
Malcolm	For the actual or for the hypothetical?
Cynthia	What do you mean by the actual or the hypothetical? What do you mean by that?
Malcolm	The actual is that, you know, you're a graduate student. It's a constructed circumstance. ...But if you were . . . By actual, or hypothetical, I mean, hypothetically, you're a real client coming to me. ...And you're saying, you know I'm going to go get a second opinion from such and such other designer, and could I improve my material somehow? What would you suggest? I say, well, you know, a table would be good, making sure the type is readable is good, making sure the people have done their homework when they arrive. So, that, you know, I've had time to read this all at home and I've had time to think about it all.
Cynthia	So, would you have liked that, if this was sent ahead of time to you?
Malcolm	Oh. Always. ... If somebody calls me up and says, you know, I'm thinking of doing a website, where I was, like, you're homework is to read these articles that I've written and posted to my website. Send me my homework so that you can, you know, we've got . . . You're initial consultation's going to be two hours. It's going to cost you 'X.' And to get the most value out of that, send me materials ahead of time, so I have time to study them.
Cynthia	Right.
Malcolm	And time to think about them.

Malcolm brings up a video concept on his own; however, much like Luke, he is picturing a video showing actual users, not actors portraying personas.

Cynthia Do you think these would have been more meaningful, if they had been shown to you as a life size poster?

Malcolm No. I don't think so.
...Posters are for reading across the room, or whatever.
...As I say, video would be very convincing, if there was some actual guy who said, you know, my name's Parxat, and I own a computer club, and here it is, you know, and we can hear what's going on in the background, . . .

Cynthia What if that was an actor doing that, would that still be . . . would that be a more effective way?

Malcolm I don't think it's more credible if it's an actor.

Cynthia It's fine if it's an actor?

Malcolm No. I think it's . . . No. I think it's . . . Is it fine, if it's an actor? Yes, but I don't think it's more credible if it's an actor.

Cynthia Is it less credible? In other words, if we hired Parxat, a guy who played Parxat, videotaped him in a play?

Malcolm I think it would be pointless, if this were a real... If you're actually hiring me to do a design, I think it would be pointless to hire an actor.
...If you can't have the real guy then you're not gaining anything by hiring an actor.

Malcolm had a positive reaction to the visual storyboard presentation of the context scenarios; however, he also wanted a more detailed scenario. In other words, the context scenarios were higher level than what he suggested in the following exchange.

Cynthia Okay. All right. What if the scenarios were instead presented through, like, visual storyboards, you know, like what you see for film? Do you think that would be a more effective way of possibly doing this kind of information? I'd love to hear your ideas about that.

Malcolm I think that the usefulness of the storyboard might be to show the different steps of the user interface.
...It might even be possible, I mean, you can take this.
...Something like the first person did. Present it as, you know, kind of, a storyboard. Here's what they see on their cell phone first.
...And then they hit enter and this is the next message they see.
...And you see, kind of, a comic book. Like a sequence of what the messages look like on the cell phone. And,

> in fact, if we took this, you know, and I came back tomorrow and you showed me, kind of, this breakdown, kind of, rewritten all nice and neat, and I would see, you know, another 50 things where, oh, at this point you need a different option, so there's another option.
> ...So, it would be very useful to have that kind of a storyboarding for the steps that the person takes as they're setting up, or searching, or whatever it might be.

96.2.1f: Marco. Recall that Marco had brought up presentation earlier when he discussed his best persona experience when he said:

- "There were posters everywhere; the business administrator, the house mom, the young kid, the...kind of like advertising really."

Later in the same conversation he expanded on the presentation modes of his best persona experience and suggests that: (a) drawings of personas were preferable to photographs; and (b) having multiple modes of presentations created a memorable positive experience.

Marco	And there was a lot of collateral. Not just posters. There was, kind of, like, little dolls.
Cynthia	Dolls?
Marco	Yeah.
Cynthia	Like action figures?
Marco	Kind of like action figures.
Cynthia	Were they pose-able or were they like My Little Pony non-jointed figures.....
Marco	They're kind of like round balls. ...They had printouts of the characters and . . . Yeah. Because the personas were actually character-drawn, kind of, cartoon-style versions.
Cynthia	How did you feel about that character drawn style?
Marco	I think that was a better approach than using just photographs, because then you are just too wrapped up into this whole photography and realistic things. It keeps things fairly abstract, which I think they should be.

I asked Marco specifically about the presentation mode of the Kyrgyz personas and scenarios. He implied that personas/scenarios are effective tools at helping

overcome assumptions (i.e. avoid stereotypes). He focused on how he felt about receiving the personas and scenarios but not on the display, content or quality of the actual presentation in the following exchange.

Cynthia	Okay. So, in this particular case you were given single sheets of personas and scenarios and you were given access to the supplemental data sheets...how do you feel about this particular presentation?
Marco	I think overall they were pretty good. I see personas and scenarios as, kind of, a way to, kind of, set the stage of the problem you're trying to solve. But I got a good feeling of the three different kinds of users that are going to be using this. And, though I didn't exactly reference them all a lot of the time, I knew there was, you know, a technically savvy user and there was a social user, and there was a person who didn't use it a lot. So, yeah, I think it was good.
Cynthia	Okay. What do you think is the most effective way to present things like personas and scenarios, or the users in general? What do you think is the best way for you to have access to who the users are?
Marco	Uh huh. That's interesting. I think scenarios and personas are part of that. ...And I think for designers there's a little bit of, you know, your own instincts, kind of, goes into it. But without something like personas or scenarios, it's too easy to fall in love with your own instincts and your assumptions of how people would use it. So, I think it's good to have these things as, kind of, a . . . to keep your balance centered.

I attempted to refocus him on the actual display; he implied that the multi-model form of presentation in his best experience added to the credibility because it implied a high level of organizational support.

Cynthia	So, just going back to the presentation, the single-sheet idea, when you're talking about the little dolls or those kinds of things, were those effective ways of transmitting user data, in your opinion?
Marco	Yeah. I think they didn't really do a good job of the individual personas.

> ... The sum total of all the advertising campaigns they did, kind of...it did increase the credibility of the idea of personas as a whole. I mean, at that point, it's up to individuals to read the research on each of those personas.

9.6.2.1g: Maria. Recall that Maria focused on the presentation (display) in the preamble portion of the study in which she: (a) called the personas 'polished' and appropriate for stakeholders; and (b) wanted additional context because of the audience distance. In the first part of our discussion, I asked Maria to reflect on the presentation modes in her other experiences. Like Marco, she suggested that a formal presentation in a meeting helped make personas more memorable for her.

Cynthia	You talked about that first time that was great where you had these posters and they had handouts....
Maria	Yeah. And there's PowerPoint presentations for a couple in the company who were invited to a meeting and they did, like, a formal presentation.
Cynthia	Okay. And these other two times where the experience wasn't so good...
Maria	It was like really quick. The project timeline was really fast. ...So what would happen would be like somebody would create these personas. Or, I would help. And that is it. I mean, it's up to you to look at these documents. ...They didn't present it.
Cynthia	And when you first looked at these, you said, "Oh, these look polished." as though it's going to be handed to a stakeholder.
Maria	Yeah.
Cynthia	So, in your experience, they haven't always been polished?
Maria	It's been polished, but not to this degree. This looks like it's been done in QuarkExpress or InDesign. ...With professional photos. I mean, the layout looks polished. ...And, of course, I've done it in Microsoft Word, which is not as nice as this.

9.6.2.1h: Heather. Heather wanted to combine the personas and scenarios into a single presentation to help avoid shuffling among several pieces of paper. She also wanted to have the bulleted list of information on the left side of the paper versus the right side.

Cynthia	In this case, you were given single sheets. Can you talk about ideas you have on more effective ways of perhaps presenting these things?
Heather	Okay. I think a very easy thing to do would make this a tabloid. Use her picture once with everything on the tabloid. *(She wanted to put the persona and scenario on one combined sheet).* ...Because I was shuffling sheets of paper all the time. ...Match 'em up. The pictures were easier to match it up. But I would just put them on a tabloid and deal with it that way. ...Other than that, . . . So, then I'd do it this way. You know, put personal information first and then her interaction information and stuff. *(Suggested changes to the persona column order).* ...And I think that makes a lot more sense . . . ...than having all these individual sheets. Because if you end up with more than three, they're all over the place.
Cynthia	All right. Anything else about the presentation?
Heather	As I said, I think the layout is fine....and the font is fine.

Heather was not terribly impressed with any of the hypothetical persona presentations.

Cynthia	Okay. Now, could you imagine . . . Would you be impressed if, for example, the personas were presented to you initially through a dramatic short play?
Heather	No.
Cynthia	Okay. What about through life-size posters?
Heather	I don't know.
Cynthia	Okay. What about, like, action figures or, like, toys?
Heather	No.

9.6.2.1i: Hannah. Hannah focused on content and the arrangement of the information.

Cynthia In this case, you were given single sheets. First, talk about how you felt about this single-sheet presentation and then tell me how you think it could have been more effective.

Hannah Well, I think one thing that really stands out to me, as you're bringing it up, because this is all white, my eyes were, kind of, like, focusing on this *(points to the gray area of the personas)*... And then I've got to scan . . . scanning through it, it's like . . . You know, to me all of this is, kind of, given and that you've been assigned to do this project. So, the technical aspects of it, you know, . . . technology aspects of it are not so important as it is, you know, the interface. You're working on the design.
...And then the goals from the, you know, user interface design are at the bottom of the page.
...So that was, kind of, you know, kind of, rearranging myself from what the page setting is. You can look at first to what the information that they wanted to know first.

Cynthia Okay. You would have done this on white and would have done this on gray because the gray is more distinct.

Hannah Yeah. Yeah. Yeah.
...And then, again, the red really stands out. And then I don't think that this is so much important to the design of this. What's in red here is, you know, motivation to acquire a mobile phone. In red, it just doesn't seem real, as important. So red should be used for what is the most important thing...in terms of the layout.
...You know, I thought, you know, the pictures of them...was very effective in bringing out the personalities of individuals.

Cynthia Okay. So, besides improving it by, you know, putting the important stuff here on white do you have any other ideas on, like, really effective ways you think that this stuff could be presented?

Hannah Well, I think the goals . . . I mean, in terms of, . . . I mean the goals better be up front and on top.
...You know, those are, kind of, like. Again, their most important things that these people . . . that I was looking for at least.

Hannah was also unimpressed with the suggested hypothetical persona presentations.

Cynthia	Okay. So, if instead these were presented through a dramatic short play, what would you think about it? Do you think it would be effective, more effective, less effective?
Hannah	Less effective.
Cynthia	Less effective. What about through, like, life-sized posters? And these are posters on a wall?
Hannah	If they had all this information, it would be just as effective, except that it would be less mobile. I can't take it with me and share it and think about it and refer back to these. So, I like these better.
Cynthia	Okay. What about, like, action figures?
Hannah	No, I don't see any…Yeah.

9.6.2.1j: Howard. Howard liked the one sheet format of the presentation; however, he would have changed some of the content. He felt that the scenarios contained too much prose and were an attempt to get him to empathize with the personas which he felt was worthless and especially excessive given the 90 minute time constraint.

Cynthia	So, I'd like to know if this particular presentation was effective. So, in this case you were given single sheets.
Howard	Yeah.
Cynthia	How did you feel about that presentation?
Howard	It's nice to have it concise. ...And it's nice to have the persona and the scenarios. There's consistency between them. ...I guess I have mixed feelings about having Shirin's picture on there, because I know that's not really Shirin ...I guess it gives me warm fuzzies, but really I wanted to know what she's going to do with it. ...I guess it doesn't hurt though. ...It's more of an icon in the corner, so I can quickly differentiate between these.
Cynthia	Okay. Do you have any ideas on more effective ways that you think this information could have been conveyed?
Howard	Roza's, for example, I guess her interaction with this application didn't start until the end of the scenario.

...It's not bad, but it did defy the 90 minute timeline, I don't want to go through the other stuff.
...I just want to get to where she's interacting with my application. I empathize with her getting broken down, but I don't need to know about that.
...So, I guess, from my perspective I would make them . . . I wouldn't need as much prose.

Howard felt that the poster format might be effective in team situations, but preferred the single sheet presentations for working. Additionally, he saw value in storyboards to present a graphical user interface (GUI) but not to display the stories described in the context scenarios. He was not impressed with any of the other hypothetical presentations that I suggested.

Cynthia If instead, the personas were presented to you through a dramatic short play, what would you think of that?
Howard That would be useless.
Cynthia Useless. Okay.
Howard Yeah.
Cynthia What about through life-size posters?
Howard This is . . . I think this is . . . This is nice that I can . . . I can rearrange it. You'll probably see in there, in the video, where I'm moving them around. I like this, where I can lay them out.
Cynthia Okay. As far as the scenarios, what would you think of those being presented as visual storyboards?
Howard Well, I'm going to go back to the life-size posters.
Cynthia Oh sure.
Howard Because, this is for just me as an individual interacting. But in reality, this wouldn't be done as an individual. I might parse through this myself, then I might have someone else parse through it themselves, but when we design this we're going design this as a team and, so, a poster on the wall of these scenarios might be useful.
...Yeah. I guess I wouldn't be opposed to that if it's a team activity.
...I still would probably say that a dramatic play is overly dramatic.

Cynthia	What if I was to present the scenarios through visual storyboards? So, I'm not sure if you've ever seen . . .
Howard	Yeah. Yeah. Yeah. For something like this, I'm not sure that would be as useful. For something that has a graphical user interface, I think that's immensely important. ...In fact, I would never do a GUI project without having: this is what the person's doing as they're going through this process. ...Or a web design. ...Something that's graphical, I would make a storyboard before I would do the project.
Cynthia	What about these particular scenarios where you actually saw pictures of Roza getting frustrated with her car and then...?
Howard	That's of no value.

9.6.2.1k: Summary of study participant's input on perceptions of presentation. Marco and Maria, who were the only participants with multiple persona experiences, were not asked about the Kyrgyz persona/scenario presentations; instead, I asked them about previous experiences. Both emphasized the need for formal presentations and indicated that they had associated a formal roll-out with high organizational support. Marco additionally discussed how a multi-model approach used in his best experience helped make the personas more memorable.

The remaining eight participants were asked to reflect on the presentation of the Kyrgyz personas/scenarios. There were some trends in the recommended changes, see Table 41.

Table 41: Presentation recommendations from study participants

	Combine comparable information (Display)	Change the paper size (Display)	Suggested changes / other comments
Leanne		Yes, to help make it more unique.	**Quality:** More information about phones with Cyrillic info (distant audience issue). Had concerns about the quality of the print-outs
Lucy	Yes		**Content:** Less personal information, less technical information
Lewis	Yes	Yes, to afford space for comparable	**Arrangement:** Better organization
Luke			**Mode:** Show videotape of actual users
Malcolm	Yes (brought up in an earlier conversation)		**Other:** Send the information ahead of time
Marco			**Other:** High end / multi-model presenations are memorable and can imply a high level of organizational support - preferred drawings to photography
Maria			**Other:** Important to include a formal presentation/meeting as part of the roll out
Heather		Yes, to afford persona and scenario combination	**Arrangement/combination**:Combine the personas and scenarios on a single tabloid size paper
Hannah			**Arrangement:** Rearrange the order of the information, important information should be on top and use color highlighting. The most important information was the goals
Howard			**Content:** Felt that the prose was excessive

Common considerations included:

- Three of these eight participants (Lewis, Heather and Hannah) suggested that the arrangement of personas/scenarios was less than desirable and that the information they found most salient was not positioned or displayed in the most effective manner.
- Two of the eight participants (Lucy and Howard) focused on content. Lucy wanted less information in the bulleted list (personal and technical information). Howard did not like the prose story format that was presented in the scenarios and part of the personas.

- Three of the eight participants (Lucy, Lewis and Malcolm) wanted to rearrange the information so that it would be easier to compare data points.
- Three participants suggested changing the paper size so that either (a) the information could be rearranged as above (Lewis); (b) to afford a combining of the persona and scenarios (Heather); or (c) to make the paper sizes more unique so the presentation felt less like 'work' (Leanne).

Novel alternate persona formats were not well received among the study participants who were asked to consider them, see Table 42. The five participants who were asked to consider visual storyboards for the context scenarios responded favorably; additionally, Maria had discussed this approach in the preamble as a way of communicating context. Videos with actual users were also suggested by both Malcolm and Luke.

Table 42: Hypothetical presentation responses

	Hypothetical presentation modes				
	Life-size posters	Short play	Action figures	Visual story-boards (scenarios)	Video with actors
Leanne	**No**	N/A	N/A	N/A	N/A
Lucy	**No**	**No**	**No**	**Yes**	**No**
Lewis	**No**	**No**	**No**	**Maybe**	**No**
Luke	**No**	**No**	N/A	**Yes**	**Yes, but with actual users**
Malcolm	**No**	N/A	N/A	**Yes**	**Yes, but with actual users**
Marco	N/A	N/A	N/A	N/A	N/A
Maria	N/A	N/A	N/A	N/A	N/A
Heather	**Not sure**	**No**	**No**	N/A	N/A
Hannah	**No**	**No**	**No**	N/A	N/A
Howard	**teamwork only**	**No**	N/A	**Yes, if for a GUI interface**	N/A

9.6.2.2: Survey Responders (*N* = 31)

In the next section, I present the findings from respondents with Designer job titles, followed by those with UX Centric job titles, and concluded with a summarization of the findings.

9.6.2.2a: Designers (N = 16). When asked how personas had been presented in the past, most respondents listed more than one format. The most common formats were: (a) posters (31%) of responders; (b) inclusion in reports or specifications (25%); (c) one page fact sheets (31%); (d) PowerPoint slides (19%); and (e) video (13%).

Thirteen of the sixteen Designer respondents answered the second follow-up question; all reported that the method they had experienced was at least somewhat effective. However, when asked to reflect on best methods (question three), the answers had more variation.

Eleven responders submitted answers that included specific recommendations for persona presentation. The responses focused on: (a) recommended formats; and (b) other recommendations. Recommendations are discussed in more detail below.

- *Recommended formats*. Eight of the eleven responders suggested specific formats. Posters, PowerPoint slides, web-based documentation and fact sheets were the most common recommended formats:
    - Three responders felt that personas should be presented as posters. Comments included:
        - "Posters would be good," Respondent 009
        - "I like the idea of posting personas in a design war room," Respondent 094
        - "Posters...that you post on each team member's wall," Respondent 077.
    - Two responders felt that PowerPoint slides were the best format (with no additional comments).

- Two responders recommended a one-page fact sheet format.

  Respondent 070 added:

  - "The most effective personas and scenarios have been very specific, and given to me in large print on an 8.5 x 11 piece of paper."

- Finally, Respondent 019 added to his recommendation of PowerPoint when he wrote:

  - "PowerPoint type presentation, web based docs for reference."

- *Other recommendations.* Eight different responders wrote of specific details they felt personas should contain.
  - Two responders felt that a visual presentation was important:

    Respondent 079 wrote:

    - "It's effective when you are creative with the visual presentation...if it's too wordy, you lose them," Respondent 079

    - "...descriptive and helped visually compare data," Respondent 127.

  - Other recommendations suggested that for a report the personas needed to be, "*in writing, with clear summaries*," (Respondent 184); Respondent 077 suggested that for one-page fact sheets, "*laminating makes it look better too, and more likely to not be thrown away*"; and Respondent 040 endorsed a multi-model approach when he wrote, "*in as many forms as possible.*"
  - Four different responders wrote about the importance of communicating the persona information:

    - "It needs to be an interactive process. A great ice breaker would be to tell a story, the user's story, of how they end up in the system, and how they get out. Maybe showing

that process as a before/after to give it more POW," Respondent 079.

- "Discussing them with others helps to solidify understanding of the persona," Respondent 040.
- "The posters are great as a constant reminder, but need to be supplemented by further information (perhaps presented in an early meeting) to explain surprising results," Respondent 007.
- "Presentations for interactiveness *(sic)* w/ researchers, documents for reference," Respondent 019.

9.6.2.2b: UX Centric (N = 15). When asked how personas had been presented in the past, responders with UX Centric job titles answered similarly to the Designer responders. The most common formats were: (a) posters (60%) of responders; (b) inclusion in reports or specifications (13%); (c) one page fact sheets (27%); (d) PowerPoint slides (20%); and (e) videos (13%).

Fifteen UX Centric respondents answered the second follow-up question; all but two felt that the format they had used was effective:

- Respondent 084 reported that she had used, "*PowerPoint, PDF in email, and posters*" and that the presentation was "*not very effective*" suggesting that "*in-person presentations*" would be the best way to maximize persona effectiveness.
- Respondent 121 had presented personas via posters and reported that the presentation was, "*Ok, but should first present the research then the end product (persona),*" suggesting that persona presentations should "*start with the research.*"

The remaining thirteen UX Centric responders who had reported that previous presentations were effective also included several recommendations to maximize the personas' presentation. Recommendations included: (a) recommended formats; and (b) other recommendations. Recommendations are discussed in more detail below.

- *Recommended formats.* Eight of the UX Centric responders included recommended presentation formats. Common recommendations were posters, PowerPoint slides, videos, and other tchotchkes.
    - Three of the fifteen responders recommended posters (some added caveats to their recommendations):
        - "Posters were somewhat effective and the actual persona layouts pretty useful when posted in plain sight," Respondent 082
        - "Posters work well for me...I think anything too gimmicky wouldn't work, but if there is team buy-in and keeps the persona present, it is OK," Respondent 095.
    - Respondent 081 had a more complicated answer, first submitting that she usually used PowerPoint calling it the "preferred method," but then added:
        - "Posters might be nice...but only if you could place them in areas where the team meets regularly."
    - Conversely, Respondent 048 preferred PowerPoint rather than posters,
        - "Presentations are good. Just one slide per persona right before walking through a design idea...posters look too 'marketing'."
    - Respondent 004 reported that she had used:
        - "...short videos... memos... webinars ...canned versions of webinars posted on the intranet ...lists of words/taxonomy taped to the wall next to people's desks ...and white board presentations... more videos would have worked better."
    - Finally, two respondents reported effective use of other types of tchotchkes and formats;
        - "...posters, detailed documents, refrigerator magnets, dolls, video "biographies" (with paid actors)...30-page document can't be beat for depth and detail, but posters,

magnets and the like are great at keeping all that detail fresh in the mind," Respondent 050.

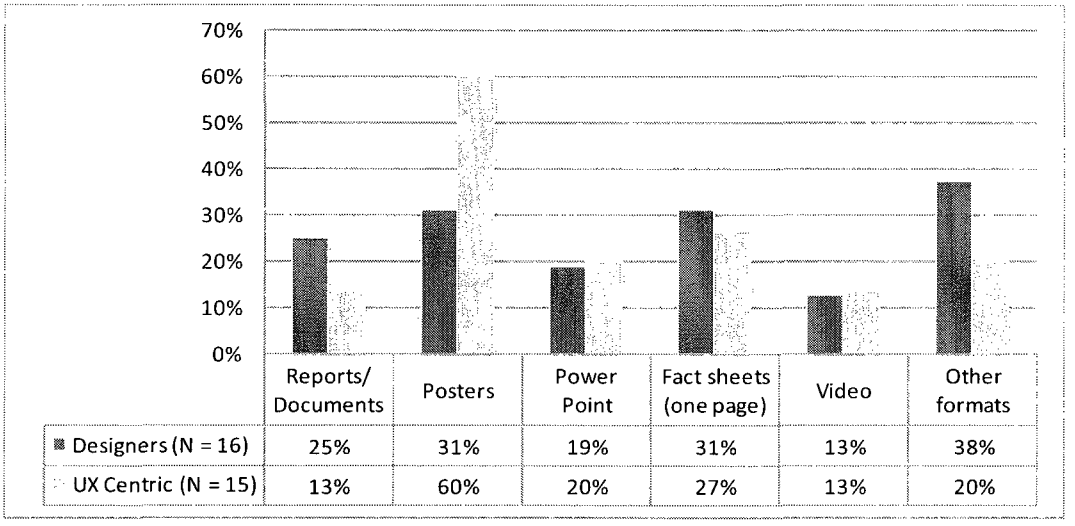
- "1-page fact sheets" but felt that "it would probably be good to do something smaller for the personas (e.g, sticker, button) to help keep them at the top of a designer's mind," Respondent 101.

- *Other recommendations*. Nine different responders wrote of other recommendations, two of which have already been discussed above. Respondent 050 recommended a multi-model approach and Respondent 121 recommended "*starting with the research*." Two other suggestions were found in the submissions.
  - Tailor or focus the presentation for the specific Designer audience was the theme of two recommendations:
    - "However is design team can best take it - it can be a one-page poster / document or a closed room presentation or hand outs of the personas with digital artifacts cut out," Respondent 069
    - "It depends...I tend to do what appears to be effective for the team," Respondent 093.
  - Making the presentation about end users was suggested:
    - "I've found that the more you can make it all about the end users, and less about your professional self, the more people will engage. Even with my rabid emphasis on research and data, I'm often perceived as just spouting my opinions along with the marketing folks," Respondent 076.
  - Four different UX Centric responders wrote about the importance of communicating the persona information in person:
    - "In-person presentations," Respondent 084
    - "Face to face had higher impact for first presentation," Respondent 083

- "In person, hopefully interactive. They should not just be read aloud to the team, but there should be a conversation and Q&A session to help solidify them in the designers' minds," Respondent 101

- "We typically tack personas to the wall, and walk through them in kick-off meetings...we'll use them in the first person when having design discussions, and try to make them as relatable as possible...," Respondent 089.

9.6.2.2c: Summary of survey responder's input on perceptions of presentation. A variety of formats have been used (most judged effective) to present personas to Designers. The three most common methods were posters, fact sheets and PowerPoint slides, see Figure 100.



	Reports/ Documents	Posters	Power Point	Fact sheets (one page)	Video	Other formats
Designers (N = 16)	25%	31%	19%	31%	13%	38%
UX Centric (N = 15)	13%	60%	20%	27%	13%	20%

Figure 100: Summary of experienced persona presentation formats

The top three recommended formats by the Designer group were exactly the same as the most common methods: posters, fact sheets and PowerPoint slides. See Figure 101.

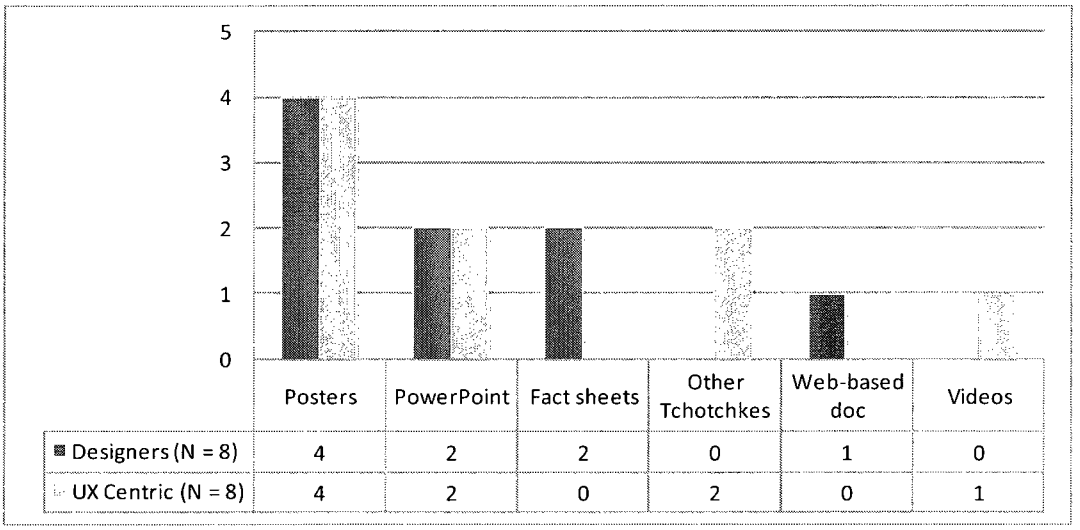


Figure 101: Summary of recommended presentation formats (survey responders)

Finally, many additional recommendations were submitted. In-person meetings were an important recommendation suggested by both job title groups. Additionally, visual displays were mentioned by 25% of the Designers who had added other recommendations, see Figure 102.

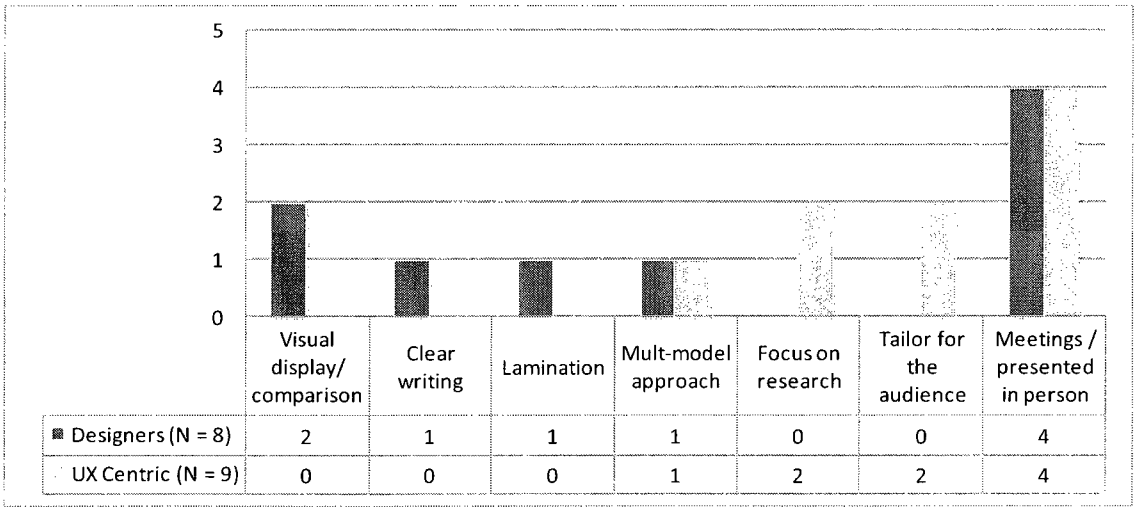


Figure 102: Summary of other presentation recommendations (survey responders)

9.6.3: Summary: presentation

When asked directly about presentation modes, there were areas of concern among the Designer groups (study $N = 10$, survey $N = 16$). Findings were in three categories: (1) display (section 9.6.3.1); (2) content (section 9.6.3.2); and (3) communication (section 9.6.3.3).

9.6.3.1: Display.

Posters, PowerPoint slides and fact sheets were the most recommended formats. Alternate formats were rarely mentioned by Designers. Additionally, when presented with hypothetical alternate formats, most study participants were not encouraging. The only exception was for a visual storyboard layout (versus text) for the context scenarios. Other suggestions included different paper sizes (Lewis, Heather and Leanne), and a multi-model approach (Marco and survey Respondent 019).

9.6.3.2: Content.

Two of the study participants (Lucy and Howard) suggested that the content provided by the Kyrgyz personas and scenarios was not what they would have wanted. This suggests that UX Researchers would benefit from a pre-research review concerning specific content that Designers feel would be most beneficial. Other suggestions for content included a comparison of data points (Lucy, Lewis, Malcolm and Respondent 079. In other words, rather than splitting the persona presentations onto separate sheets, provide a visual comparison among the personas by grouping on one sheet to make persona differences more salient.

9.6.3.3: Communication.

Maria, Marco and four Designer survey responders focused on a need for a formal presentation or meetings to communicate the personas/scenarios. Additionally, Respondent 079 suggested making the roll-out of personas/scenarios more interactive. A formal presentation was also associated with a high degree of organizational support

by Maria and Marco. This finding suggests that a key to UX research success is a face-to-face communication about the end user findings.

9.7: Distant Audience

The last set of questions related to perception was intended to measure the effect of the distant audience. As with all the perception-related variables, there were differences in how the questions were asked of the study participants versus the survey responders. The next sections describe the question and data analysis procedures for the responses (section 9.7.1.), findings (section 9.7.2) and a summary (section 9.7.3).

9.7.1: Question and data analysis procedures

Study participants were asked to reflect on differences they felt existed between the personas/scenarios they had just used, which represented mobile phone users in Kyrgyzstan, versus personas and scenarios that represented office workers in Seattle. Specifically, I asked participants to reflect on differences in the effectiveness of the documents at conveying end user information. Five participants were also asked to reflect on differences in the effectiveness of the documents if they represented teens with autism who used mobile phones with office workers in Seattle. Answers were coded for: (a) differences among the perceived level of effectiveness of the documents: and (b) salient considerations in their answers.

Survey responders were asked to rate the level of difference they felt existed between personas/scenarios which represented mobile phone users in Kyrgyzstan compared to office workers in Seattle. The same two questions were then asked about teens with autism who were located in Seattle compared to office workers in Seattle. The second set of questions, about teens with autism, was intended to probe differences in the persona/scenario methods that were encountered by a psychological distance as opposed to a geographical distance. This was followed by an open ended question asking for respondent reflections of possible differences. I first analyzed the ratings descriptively and then compared the ratings from Designers to those of UX Centric

responders through non-parametric statistical tests. Open ended answers were coded for reasons associated with the relative effective ratings.

9.7.2: Findings

The next sections present the findings for the study participants (section 9.7.2.1) first, followed by the survey responders (section 9.7.2.2).

9.7.2.1: Study participants (N = 10)

Study participants were asked to reflect on differences they felt existed between the personas/scenarios they had just used, which represented mobile phone users in Kyrgyzstan, versus personas and scenarios that represented office workers in Seattle. The manner in which I asked the question evolved because my approach for the first five participants was somewhat ineffective at eliciting answers pertaining to persona/scenario effectiveness. For example compare my wording for the question for the first participant (Maria):

> **Cynthia** Can you talk about the differences in using these personas and scenarios, specifically, in that they are describing people who are geographically and culturally distant? What kind of differences can you imagine in dealing with these kinds of personas and scenarios with ones that probably describe users with whom you are more familiar?

To this question for the last participant (Lucy):

> **Cynthia** Just imagine that you have this stack representing people in Kyrgyzstan *(Put my hand on the persona stack)*. And you have a matching stack, pretty much the same layout, pretty much the same stuff, of office workers in Seattle. Okay? Talk about the differences between those two stacks of information.

Because of my initial difficulties communicating the question, I only focused on the Kyrgyz audience comparison for the first five participants (in order, Maria, Marco, Leanne, Heather and Hannah). Later, when I changed the wording to develop a more

effective question, I added the autism audience comparison for the last five participants (in order, Howard, Luke, Malcolm, Lewis and Lucy).

9.7.2.1a: Leanne. Leanne first focused on differences of content that the two kinds of personas (Kyrgyz mobile users versus Seattle office workers) might contain. She suggested that it would have been helpful to have more context with the Kyrgyz personas and scenarios. Later in the exchange, she suggested that books that she has read have given her a deeper understanding of different cultures. While she did not directly address relative effectiveness between the two groups of personas, she implied that this deeper understanding helped her understand the mobile users from Kyrgyzstan and lead her to assume that the Kyrgyz users were not that different/distant.

Leanne	Okay. I guess, well like, samples of their language would have been good... And maybe, like, photographs of their lifestyles. ...Yeah. I think that's about it. I mean, these people aren't that different. I mean, other than, like, a relative term, in terms of money. ...You know, I mean, I'm assuming there aren't that many wealthy types, you know, like Bellevue housewives or something like that in Kyrgyzstan. But maybe, you know, I'm sure there's still, you know, a level of, you know, like, there is the wealthy there. I don't know exactly what they're like, but I'm assuming that it's not terribly different...from ours.
Cynthia	It sounds to me like what you're saying is that because you didn't have very much exposure and you're thinking that maybe more context would have been helpful.
Leanne	Yeah. But then I guess I don't, I mean, I'm not, you know, claiming to know anything about these people, but I suppose just from, like, you know, past books I've read, I guess I feel like I do have already kind of, like, a mental image there about . . .
Cynthia	So, what other books besides The Two Cups of Tea *(she mentioned this earlier)*?
Leanne	I've read Kite Runner...and a Thousand Splendid Suns ...Yeah. I think that's all.
Cynthia	Okay. It's helpful information for us because you have a framework that you're working with.

Leanne	Yeah. So don't feel like it's totally foreign, you know?
Cynthia	Right. And you kind of feel like you already have a little bit of exposure.
Leanne	Right. ...So, I guess that's why I don't feel like, you know, like it was all totally new to me.

9.7.2.1b: Lucy. While Lucy recognized that the Kyrgyz audience would be different from what she was familiar with, she did not feel that this would be associated with the level of persona/scenario effectiveness. However, she felt differently about the autism group; she felt that personas describing teens with autism would be less effective because she felt more distance.

Lucy	Well, I think it's a different kind of . . . The society itself is different. It seems like it has a different approach to the technology. So, I don't think it's that they're more or less effective. I think it's two different ways of approaching the information that are both equally effective in their own way. Because I think the average probably Seattle office worker is pretty, you know, they're pretty used to the internet. And they certainly have their phone on and constantly texting. And I think the people from Kyrgyzstan are maybe just as active with their phones, but less, maybe, internet computer-savvy.
Cynthia	Okay...Now picture the same two stacks, but instead you've got teens with autism and office workers in Seattle. The teens with autism live in Seattle. So, in other words, the distance isn't geographical, it's psychological.
Lucy	Psychological?
Cynthia	Yeah. Instead of a geographical gap.
Lucy	Well, God, from what . . . From the few autistic cases I've know, they have been absolutely brilliant in their own way. And one of them happened to be absolutely brilliant with computers. ...But it's just the social interaction for him that wasn't quite what most people would consider normal.
Cynthia	So, if you were tasked with designing a computer interaction for these office workers and a computer interaction for these teens with autism, do you think

	these types of documents would be more or less effective given those different scenarios?
Lucy	I'm not entirely sure that these documents would be very effective for the autistic kids. ...Just because they approach the world in such a completely different way.
Cynthia	All right. So, they wouldn't really help getting to know people with autism?
Lucy	I don't think so.

9.7.2.1c: Lewis. Lewis did not feel there would be a difference of effectiveness between the Kyrgyz personas/scenarios and those representing office workers in Seattle. However, he focused on the differences in doing the underlying research rather than the documents themselves. Consequently, he questioned the methods that researchers would need to use to gather information about teens with autism.

Lewis	I don't think there's a difference.
Cynthia	Okay. Can you talk a little bit about that?
Lewis	Oh. I think if the people are honest about the way they use systems and devices, then they're just going to give you the same amount of information. The scenarios, how they used them, their personal profile, and their information. If they want to be in the study, that is. ...You're going to get the same amount of information and be able to get at it in the same way.
Cynthia	Okay. Great. And what about if the two stacks were office workers in Seattle and teens with autism? What would be the difference then?
Lewis	Well, I don't . . . It depends on how you get the information on the teens with autism, because they're obviously not going to speak with the researcher openly. ...So, you may need to change your methodology for how you get that information from them and/or their parents.

9.7.2.1d: Luke. Luke first suggested that the Kyrgyz personas/scenarios would be more effective based on an assumption that office workers in Seattle would be more homogenous and more like himself. Luke and Lewis had similar reactions when considering the autism audience, in that, they both focused on differences required in

the underlying research rather than the differences among the documents. Luke did not think the findings from the research involving the autism audience would therefore be as reliable.

Luke	I think that Kyrgyzstan would be more effective, because there are so many differences among the demographics there. Like, in Seattle, we're all, like, pretty much the same. We all use the internet. We all have the internet. We all have mobile technology. We're all proficient in it. If we're working in an office, we're all educated. You know.
Cynthia	All right. So, you feel like you can make a lot more assumptions about people in Seattle?
Luke	Yes. Yeah.
Cynthia	Okay. What if you had a stack of office workers in Seattle and the other stack was describing teens with autism, in Seattle? Do you think that one would be more effective at conveying user research than the other?
Luke	I think that it would be more reliable from the office workers in Seattle.
Cynthia	Okay. And why do you say more reliable?
Luke	Because part of that information would make a lot more sense instead of information from autism people.

9.7.2.1e: Malcolm. Malcolm focused on the researchers' background; he made the assumption that there would be more similarities among the researchers and the Seattle office workers resulting in more accurate personas/scenarios, which in turn, he felt would be more effective. He had a different reaction to the personas/scenarios representing teens with autism; he suggested that he would have more in common with the autism audience thereby making the documents equally effective.

Malcolm	I would have a greater confidence that you had represented them fairly and I had understood them fairly.
Cynthia	If they living in Seattle?
Malcolm	Sure. ...I would think there would be more similarities and less differences.
Cynthia	So you think that the Seattle personas would be more effective?

Malcolm	That's fair to say.
Cynthia	What about if you had two stacks and one was teens with autism, who also lived in Seattle?
Malcolm	That is a particularly interesting question. probably equally effective.
Cynthia	Equally. Okay. Now why did you rate them differently?
Malcolm	I think because I feel that I, perhaps, have a greater understanding for people with autism. ...I guess it's fair to say people genetic and mental and emotional differences than I do of people with cultural differences.

9.7.2.1f: Marco. Marco implied that the Kyrgyz personas/scenarios would be more effective than those representing office workers in Seattle because he could not make as many assumptions about the audience.

Marco	In general I, kind of, rely on the ideas presented here more. ...Because at first there was nothing I really knew about them. But then, you know, over time, as it became more comfortable, I, kind of, realized that the social user, even though she doesn't use the internet or may not make as many phone calls as a regular person that I am familiar with that I would consider a social user in America, began to apply those kinds of ideas to her role in texting and there is no internet. So, yeah, I think it was pretty useful. ...And then, you know, the practical guy, even though, you know, he's running a business in the country, there's certain things that you attribute to business owners that you, you know, are considerate of. But you also, kind of, place it into fair context. ...Yeah. But definitely at first I was just very reliant on the information presented to, kind of, create an idea of who these people are.
Cynthia	So, do you think that you were more dependent on this information than you would be let's say if you were given three mobile users in the states?
Marco	Yeah. I think I am. That's interesting, because I think I would be. Yeah.

9.7.2.1g: Maria. Maria's reaction was that the summarizations represented by the personas and scenarios were not sufficient to really 'get' a distant audience. As such, she suggested that she would want greater access to the raw data when dealing with a distant audience.

Maria	So, the difference between users who were far away in remote areas . . . ?
Cynthia	Do you think there's any differences in dealing with these types of materials. . . I think at one point you said you wanted to see more context.
Maria	Yes. Right. For sure. Because, I've never been to this country, and it really helps to understand the culture more. For me, I've read about, like, I think, this company in New York that created an application for this South African nation. I mean, the culture was, like, completely different and it was in regards to dealing with Aids; getting tested. So, this design company . . . I'm trying to remember what company it was. I can email it to you.
Cynthia	That would be great.
Maria	Okay. So, I mean, you know, it's really expensive for them to always fly to South Africa to do the research. And also, the South Africans, they didn't trust Americans or Westerners. They thought, you know, becoming as experts, and we don't want to be ruled by them or bossed around. So, it really helps to understand the people, to go there and talk to people, because this paper *(indicating a persona)* I mean, this is often times the case. I've noticed this. Even if I create the deliverables, make it really nice and presentable, they'll just, like, glance through it. They don't really get it. ...So, as a designer, I mean...Another company may have created these persona documents, and scenarios, but I want to really get it like the data like researcher.

9.7.2.1h: Heather. Heather's reaction was similar to Maria's; a greater distance between her and the audience meant that she wanted to be closer to the actual research. Heather took this concept even further than Maria suggesting that she would want to be

the researcher, suggesting that the summarizations of distant users are not as trustworthy.

Heather	I think as a person who's going to set them up you have to first understand the culture. ...And you have to probably go over there and see it for yourself. Because this is so different from us. So different from us. But as an example, even within the US, let's say I was going to go to some of the poorest parts of the US and set up something like this. It's almost the same thing, except different. I would have to go there and understand what their needs are, because their needs are much different than my needs. ...And get a chance to sit down and talk to them and to discuss with them. What would this mean to them? How would it change their life if this were to come into their area?
Cynthia	Let's say this was an actual project that you were given. Would you want to do that yourself? Would you want to go talk to the people?
Heather	Absolutely.
Cynthia	Okay. You wouldn't want it packaged like this . . . ? *(Indicating the personas/scenarios)*
Heather	No.
Cynthia	You'd want to do it yourself?
Heather	With an interpreter...and I would want to think out very carefully a lot of the questions that I would want to ask.
Cynthia	Okay. And who would you consult about those questions?
Heather	Hopefully people have gone there before. I'd have an opportunity to talk to people who have gone there before. Or maybe people have lived there and now they're here, and maybe still have relatives back there and that might give you some, you know, contacts when you could start to meet with when you go out there.

9.7.2.1i: Hannah. Hannah and I did not communicate well on this question. Hannah focused on comparing the users represented by the personas/scenarios to assumptive users in Seattle. At one point I tried to refocus her on comparing the document effectiveness (not the actual users); however, she did not seem to understand

what I was asking so I moved on to the last set of questions (identifying cognitive design strategy).

Hannah	Okay. So, just comparing this Seattle user groups?
Cynthia	Yeah. Right.
Hannah	Well, I think that persona for Roza seemed kind of extreme, but I also know that there are a lot of people . . . I mean, there are still people in our, you know, country who don't do texting and they don't . . . I mean, you can always go to the library and use the internet. So, I think that having that 'no text' option, . . . It's still a good option, especially for . . . I don't know, maybe some people in the older generation aren't used to using that. We still want to have that classification for people who, you know, are just going to want to use their regular telephone numbering system. And the social actor is still valid. It's very similar to, you know, students here. And then, the business aspect . . . Yeah. I think it's still pretty pertinent to the business owners in Seattle and workers as well.
Cynthia	Okay. So, do you think that these personas are more, or less, or about the same effectiveness at giving you user information as they would get if they were people in Seattle?
Hannah	Well, they seem to emphasize the fact that their own social community was real important to them. ...And, so, maybe that aspect of it is something that may be a little bit more culturally significant than it might be in Seattle. ...where they want to have those groups of just their neighbors and friends where meet and, I think, have groups that are people we don't even know. People we register for and get to know then through that process.

9.7.2.1j: Howard. When thinking about the differences among personas/scenarios representing office workers in Seattle and the mobile users in Kyrgyzstan, Howard focused on the specificity of the content. He suggests in this exchange that the effectiveness of the documents would not change; however, the

documents representing a distant culture need to be more general because he has less initial understanding.

Howard	So, these personas gave me very little glimpse of people that I don't know anything about. ...Whereas an office worker in Seattle, I can really relate to that. Obviously. ...But if you wrote a persona about an office worker in Seattle, it would have to be much more specific. ...Because I do know that it's not going to be of any value, whatsoever, unless you tell me that it's an office worker doing exactly this, this, or that. ...It would be a much more specific persona. Whereas these personas we have a whole generation represented by Shirin. We have all business owners represented by Parxat. And we have everyone that lives outside of town represented by Roza. Whereas, if you wrote one for downtown Seattle workers, right there you're much more specific. ...And if you were multiple, then you could be . . . So, I guess it would have the same value. ...You have to be much more general, if it's going to be a distant and foreign culture. If it's something I know intimately, you're going to have to be much more specific if you have different personas.
Cynthia	That's great feedback. So, what about if these personas were about teens with autism?
Howard	And you're going to put them in a stack and hand them to me for the same application?
Cynthia	Yeah.
Howard	It would not be any more useful what so ever.

9.7.2.1k: Summary of distant audience discussion with study participants.

This set of questions was intended to investigate perceptions held by local (Seattle) Designers about differences that are introduced when persona/scenario documents represent an unfamiliar audience. Not all the participants focused on differences of document effectiveness and what was salient to each designer about differences was wide ranging, see Table 43.

Table 43: Audience distance summary for study participants

	Effectiveness versus office workers in Seattle, Washington, USA		
	Mobile users in Krygyzstan	Teens with autism	How discussed / salient differences
Leanne	N/A	N/A	Content would need to change (added context for KG)
Lucy	Same level	Less effective	People with autism represent a greater distance
Lewis	Same level	N/A	Underlying research would need to change -- People with autism represent a greater distance
Luke	More effective	N/A	Underlying research would need to change -- People with autism represent a greater distance
Malcolm	Less effective	Same level	Researcher and designer relationship to the audience would be a key difference.
Marco	More effective	N/A	KG would be more effective because he could not make as many assumptions
Maria	N/A	N/A	Content would need to change (added context for KG) - wanted more direct contact with the research
Heather	N/A	N/A	Greater audience distance meant that she wanted to be closer to the actual research
Hannah	N/A	N/A	She compared users rather than differences of document effectiveness
Howard	Same level	Same level	The effectiveness would not change - however the level of specificity (content) does

Salient differences were categorized into four groups: (1) content changes; (2) research related; (3) differences of distance; and (4) differences in the effectiveness of the documents. Each is detailed in the next sections.

- *Content changes.* Recall that in the preamble, Maria suggested that the introduction of an unfamiliar audience required a content change; she wanted to see more context, for example, pictures of the users in their everyday lives. When questioned directly about how audience differences affect persona/scenarios, Leanne had a similar conclusion in that she wanted more contextual information. Howard also perceived the audience differences in

terms of content changes; however, he felt that the content would need to be more general in the case of a more distant audience.

- *Research.* Several participants focused on differences in the research to create the personas/scenarios of an unfamiliar audience. There were three different types of focus: (a) the Designer relationship to the research; (b) the reliability of the underlying research; and (c) the researcher and/or designer relationship to the audience.
    - *Relationship to research.* Maria expanded her initial concept (desiring more context) by suggesting that she would also desire more contact with the raw research when considering a distant audience. Heather took this concept even farther by wanting to conduct the research herself when dealing with a distant audience. Both of these participants are suggesting that to get a full understanding about the audience they would require a deeper engagement with the research.
    - *Reliability of the underlying research.* Lewis and Luke perceived the audience differences in terms of how the underlying research would be conducted. Both participants focused on the difficulty of doing research on people with autism suggesting that the personas/scenarios would not be as accurate and less 'reliable'.
    - *Research team/ Designer relationship to the audience.* Malcolm felt that the personas/scenarios representing office workers in Seattle would be more accurate because of the assumed similarities among the researchers and the end user audience. Conversely, when considering the personas/scenarios representing teens with autism, Malcolm felt that he personally would have more in common with the autism audience which would make the documents equally effective as those representing office workers in Seattle.

- *Differences of distance.* Not all participants were asked to consider both distant audiences (mobile users in Kyrgyzstan and teens with autism). Among those that were asked (Howard, Luke, Malcolm, Lewis and Lucy), there were differences as to which group was perceived as more distant. Lucy, Luke and Lewis all suggested that the audience with autism was more distant; i.e., more difficult to understand and/or research. Conversely, Malcolm felt that the Kyrgyz audience was more distant. Howard did not discuss relative distances of the audience.
- *Document effectiveness.* While relative document effectiveness was the original research question, not all participants addressed this. As I suggested in the introduction to this section, this was because I found this question initially difficult to communicate. Of those that judged differences of document effectiveness between the Seattle office workers and Kyrgyz mobile users, Luke and Marco felt that the Kyrgyzstan personas/scenarios would be more effective and Malcolm felt that they would be less effective. Lewis, Lucy and Howard did not feel there would be a difference of effectiveness.

  Only three participants (Lucy, Malcolm and Howard) made judgments regarding the differences of document effectiveness between Seattle office workers and teens with autism located in Seattle. Lucy felt that the personas/scenarios representing the autism audience would be less effective, while Malcolm and Howard suggested there would be no difference of effectiveness.

9.7.2.2: Survey responders (N = 32)

Survey responders were from a variety of locations; all, except for one, were located in the United States. Among Designer responders ten were from the Seattle area of Washington state, two were from Texas (one each from Temple and Dallas), and one responder was from: (a) San Diego, California; (b) Cambridge, Massachusetts; (c) Spring Hill, Tennessee; and (d) Atlanta, Georgia.

Among UX Centric responders, ten were from Washington state (eight were from the Seattle area and one from Bellingham). Two respondents were from California (Santa Monica and Oakland). One responder each was from: (a) Minneapolis, Minnesota; (b) Portsmouth, Rhode Island; (c) Madison, Wisconsin and (d) Portland, Oregon. Only one respondent (Respondent 069) was not located in the United States; she claimed to answer the survey from Pune, India. (She rated the differences among using the distant personas as neutral). In the next sections, I first present the findings for the ratings (section 9.7.2.2a) followed by the open-ended responses (section 9.7.2.2b).

9.7.2.2a: Ratings findings. In analyzing the findings, I reduced the range and combined the 'much less effective' and 'less effective' answers; I also combined the 'much more effective' and 'more effective' answers, resulting in a three point scale. There were differences among the ratings between two job title types (Designers versus UX Centric).

When comparing the Kyrgyz audience to the Seattle audience, the Design group was much more likely to see differences, see Figure 103. None of the UX Centric group thought that the Kyrgyz personas would be less effective. The differences between the job title groups were not statistically significant.

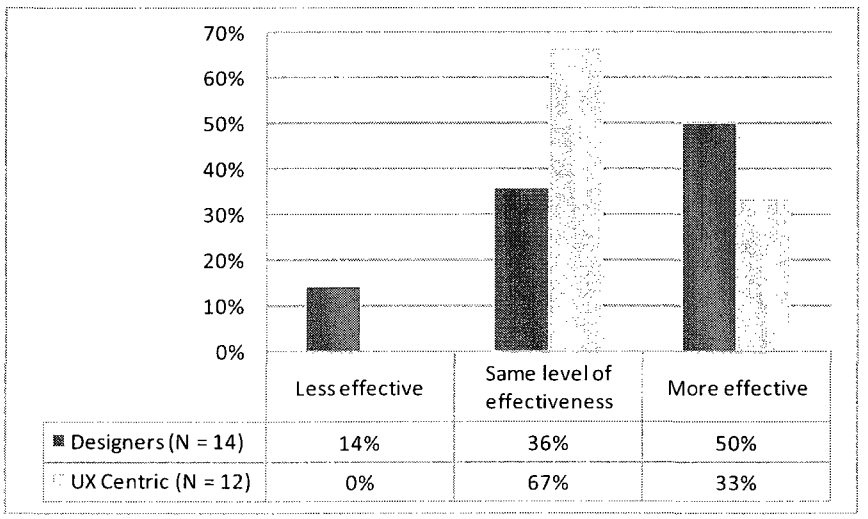


Figure 103: Distant audience perception: Geographic differences (Kyrgyzstan)

The findings were similar when comparing the autism audience to the Seattle office workers, see Figure 104. Designers were much more likely to note differences. In this case the findings between the job title groups was significant, $\chi^2(2, N = 30) = 6.31, p < .05$.

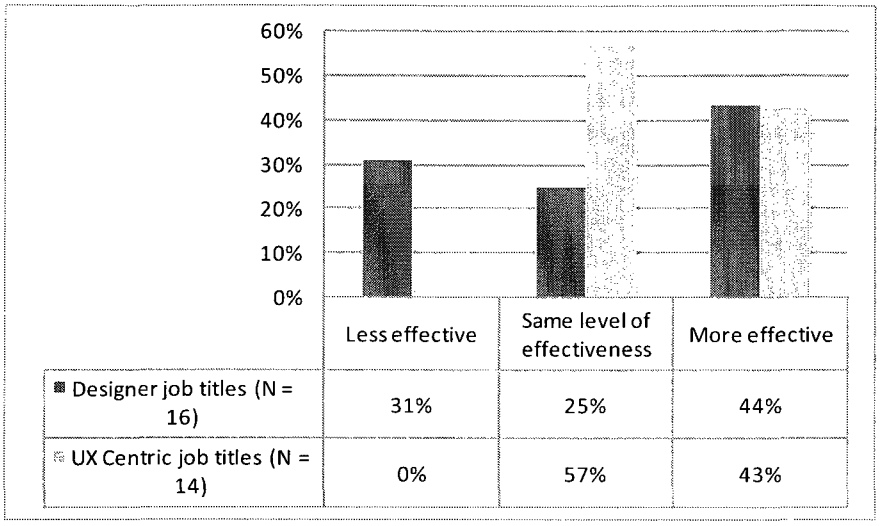


Figure 104: Distance audience perception: Psychological distance (Autism)

The variation within the two job title groups was also quite different. Of the twelve UX Centric responders who answered both questions, all answered identically for the two types of distant audiences. In other words, the UX Centric group was less likely to differentiate between the two types of distance (i.e. geographical versus psychological). Conversely, 36% of the Designer group answered the questions differently when considering the two types of distance.

9.7.2.2b: Open-ended responses. This section presents the open-ended findings for the write-in rating option and the follow-up question which asked responders "use this space to add any thoughts you have about the importance of who the personas are describing relative to their effectiveness as conduits of user research." The next sections present the findings for the Designer group followed by the UX Centric group.

- *Designers (N = 16).* Of the sixteen responders in the Designer job title group who rated at least one of the distant audience comparisons, five wrote in

meaningful follow-up comments. The comments are grouped by how the respondent rated differences:

- Personas would be more effective when representing an unfamiliar audience (Kyrgyzstan $N = 7$, Autism $N = 7$). Three of the respondents who rated that personas/scenarios representing an unfamiliar audience would be 'much more effective' or 'more effective' also wrote a follow-up comment:
    - "The more they are not like you, the more effective they would be," Respondent 094 (from Dallas, Texas)
    - "Personas and scenarios have the most benefit when they are describing user research results that are outside the development team's personal experience," Respondent 007 (from Redmond, Washington)
    - "You don't have direct experience with," Respondent 077 (from San Diego, California).

- Personas would be less effective when representing teens with autism, but more or equally effective at representing mobile users in Kyrgyzstan ($N = 3$). Two responders with this mixed response wrote additional comments:
    - "This is a good question... I think location specific and task specific is important, but obviously in your autism example, this might not be the case...cultural differences are important though," Respondent 070 (from Cambridge, Massachusetts)
    - "The research will be more valuable if the researcher can effectively communicate with the user, for example, a researcher familiar with the customs of Kyrgyzstan will be more effective in research there," Respondent 104 (from Renton, Washington), indicating that she did not feel that researchers could effectively communicate with people with autism.

- *UX Centric (N = 14).* Fourteen responders in the UX Centric job title group rated at least one of the distant audience comparisons. Ten responders wrote follow-up comments. The comments are grouped by how the respondent rated differences:
    - Three UX Centric respondents submitted 'other' write in answers to the ratings questions:
        - "The Kyrgyzstan ones are effective for understanding minor detail...the Seattle ones are effective for dispelling the myth that we are just like our users...people would feel that the Seattle ones are less effective, but in truth they are equally effective," Respondent 095 (from Santa Monica, California)
        - "It depends on where the design team is...are they mobile users or have direct access to the office workers...if the team has direct access to the user group(s), they put less emphasis on the personas," Respondent 093 (from Madison, Wisconsin)
        - "Effective at conveying research across cultural boundaries; otherwise no difference within a culture," adding that "the less similar the user and the research/development team is, the more useful information conveyed in a good persona can be," Respondent 050 (from Redmond, Washington).
    - Personas would be more effective when representing an unfamiliar audience (Kyrgyzstan $N = 4$, Autism $N = 6$). Three of the respondents who rated that personas representing an unfamiliar audience would be 'much more effective' or 'more effective' also wrote a follow-up comment:
        - "Much more effective at describing people who are significantly different than the researchers and/or design team, as the designers' may have fewer ideas of their own about the users and/or be more surprised/interested in the research," Respondent 101 (from Portland, Oregon)

- "More difficult to try to use personas and scenarios to describe users that are very close to, or believed to already be understood by the project team," Respondent 083 (from Oakland, California)

- "It really depends on who your targeted audience it but my personal design philosophy is that of inclusion... I believe it is important to include all potential users ... including those who may have learning challenges or cultural differences," And Respondent 189 (from Redmond, Washington).

- Personas would be equally effective when representing an unfamiliar audience (Kyrgyzstan $N = 8$, Autism $N = 8$). Four of the respondents who rated that personas representing an unfamiliar audience would be equally effective also wrote a meaningful follow-up comment:

  - "Personas are meant to convey something about the user...the information and depth might vary depending upon the context/ user...the effectiveness lies with the content and not "who" it is being conducted for...it is a methodology," Respondent 069 (from Pune, India)

  - "If you're assuming in these contexts that the personas are being presented to and used by office workers in Seattle, then the personas of mobile users and computer users with autism may be more impactful because they're describing less familiar contexts and behaviors...just because the context is familiar doesn't mean the personas of Seattle office workers are necessarily ineffective...if all of the above personas are presented to web developers in Hyderabad, they would all be equally effective," Respondent 076 (from Bellingham, Washington)

  - "The point behind personas/scenarios is not to describe the unfamiliar, but to show the client that they necessarily don't know EVERYTHING about the user...so a persona about Seattle office workers presented to a Seattle office worker would be just as effective...it would show them that they aren't designing for

themselves, but the larger self of the customers," Respondent 081 (from Seattle, Washington)

- "It all depends on the context of the research and how much do they and their client already know about the user base? What's the cultural context of the researcher? Have they done similar projects in the past? All of this changes the game," Respondent 089 (from Seattle, Washington).

9.7.2.2c Summary of distant audience discussion with survey responders. There were three major findings among the survey responders when considering how the unfamiliarity of an audience is associated with persona/scenario effectiveness.

First, Designers were much more likely to note a difference in persona effectiveness relative to the audience the documents describe. About a third (36%) of Designers rated the Kyrgyz/Seattle comparison as equal and 25% rated the autism/office worker comparison as equal. Conversely, among the UX Centric group 67% rated the Kyrgyz/Seattle comparison as equal and 57% rated the autism/office worker comparison as equal. This also suggests that both groups perceived more difference in the autism/office worker (psychological distance) hypothetical situation.

Second, not a single UX Centric responder rated the unfamiliar audience personas as less effective. Designers who felt that there were differences also were more likely to rate the personas depicting an unfamiliar audience as more effective.

Third, most of the follow-up comments, even from those responders who rated the effectiveness as equivalent, expressed an opinion that a state of unfamiliarity resulted in greater effectiveness for personas. Of the fifteen responders who included a 'other' write in response or a follow-up comment, nine submitted comments that supported unfamiliarity as associated with greater effectiveness. Four of the remaining write-in comments suggested that differences of effectiveness were dependent on: (a) the researcher's understanding and grasp of the user audience (Respondents 104 and 089); the design team's location and understanding (Respondent 093 and 076); and (c)

the end-user audience (Respondent 189). Respondent 095 suggested that personas representing a familiar audience would be better at some things but worse in some ways when compared to those representing an unfamiliar audience.

9.7.3: Summary: distant audience (Designers *N* = 26)

Since I am primarily concerned with Designer perception, I have focused this summary on findings concerning the distant audience questions for the Designers. Findings are summarized in three sections: (1) summarized findings from the study participants (section 9.7.3.1); (2) combined findings of effectiveness from survey responders and study participants (section 9.7.3.2); and (3) relationships among effectiveness ratings and other designer-related variables (section 9.7.3.3).

9.7.3.1: Study findings (*N* = 10).

Study participants had a range of responses when considering differences between using personas and context scenarios representing a familiar audience with those that represent an unfamiliar audience. Expected changes included: (a) content changes; and (b) research changes.

- *Content changes.* Two participants (Maria and Leanne) suggested that more context would be required when personas/scenarios depicted a distant audience. Howard felt that the content would need to be more general in the case of a more distant audience.
- *Research changes.* Several participants focused on differences in the research. There were three types of research changes suggested: (a) the Designer relationship to the research; (b) the reliability of the underlying research; and (c) the researcher and/or designer relationship to the audience.
    - *Relationship to research.* Maria wanted more direct contact with the raw data while Heather wanted to conduct the research herself; this suggests that the greater the distance the more UX researchers might want to involve Designers in the research.

- *Reliability of the underlying research.* Both Lewis and Luke felt that it would be more difficult to do research on people with autism suggesting that the personas/scenarios would not be as accurate and less 'reliable'.
- *Research team/ Designer relationship to the audience.* Malcolm felt that the personas/scenarios representing office workers in Seattle would be more accurate because of the assumed similarities among the researchers and the end user audience. He had a different reaction to the personas/scenarios representing teens with autism; he suggests that he would have more in common with the autism audience thereby making the documents equally effective:

9.7.3.2: Effectiveness.

I combined the results for the study participants who rated the effectiveness when considering a distant audience ($N = 6$, see Table 43) with survey responders ($N = 16$) with Designer job titles .There were three major findings.

First, the unfamiliarity of the audience was a salient concern. When considering the autism versus office worker audiences, 81% of Designers (combined group of study participants and survey responders, $N = 18$) perceived a difference of effectiveness for personas/scenarios. When considering the Kyrgyz/Seattle comparison ($N = 20$), 70% perceived a difference of effectiveness. Of those who found differences, most (64%) found the personas (and context scenarios) representing a distant audience as more effective.

Second, many Designers rated the differences found in effectiveness of personas of the audiences (Kyrgyz/autism) differently. Among the combined Designer group, the responses between the audiences (Kyrgyz/autism) were not significantly correlated to each other, $r = .428$. More than half (56%) of the group who rated both audiences ($N = 16$) provided the same answer when considering either audience (this is low compared to the UX group in which 100% provided the same answer for both).

This suggests that the geographical/cultural distance is perceived differently than the psychological difference (at least in the case of Kyrgyzstan and teens with autism).

Third, more distance was perceived for the autism audience; i.e., the psychological distance was seen as a larger gap than the geographical and cultural distance. In the combined sample, 30% of Designer responders felt that there would be no difference found between the effectiveness of the Kyrgyz/Seattle personas while only 19% felt that there would be no difference when comparing the autism/office workers.

9.7.3.3: Relationships among effectiveness ratings and other designer-related variables.

I looked for patterns among the ratings and other Designer-related variables (profile variables, empathy dimensions, design cognition strategy, number of projects using personas (HCD orientation) and HCD orientation alignment scores). I put the Designers into three groups relative to each audience: (1) more effective; (2) equal effectiveness; and (3) less effective and used the grouping to perform non-parametric tests.[74] Two patterns were found.

First, the number of projects in which personas were used was significantly associated with the rating groups for the Kyrgyzstan mobile user comparison, $\chi^2(2, N = 20) = 6.26, p < .05$, see Figure 105. Experience using personas in more projects was associated with survey responders and study participants who found the personas (and context scenarios) representing Kyrgyz mobile users as more effective than those representing Seattle office workers. This suggests that Designer more experienced with personas may feel that they are going to get more effective information from personas when dealing with an unfamiliar audience.

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[74] For the scaled variables (empathy, number of projects, HCD orientation alignment, age and professional experience) I used a Kruskal-Wallis test and for all other variables I deployed a Chi-square test.

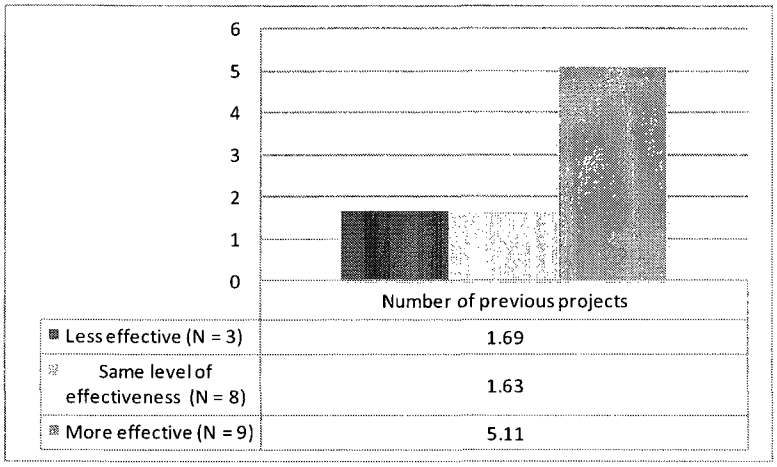


Figure 105: Number of persona projects by distant audience effectiveness (KG)

Second, there was a clear pattern among the design cognition groups when considering persona/scenario effectiveness between teens with autism and office workers in Seattle. While the difference is not significant, $\chi^2(2, N = 10) = 4.44$, $p = .108$, all (100%) of the solution-driven group found the personas/scenarios describing teens with autism less effective. See Figure 106. This suggests that the solution-driven group may pay less attention to UX research when it describes an unfamiliar audience representing a psychological distance.

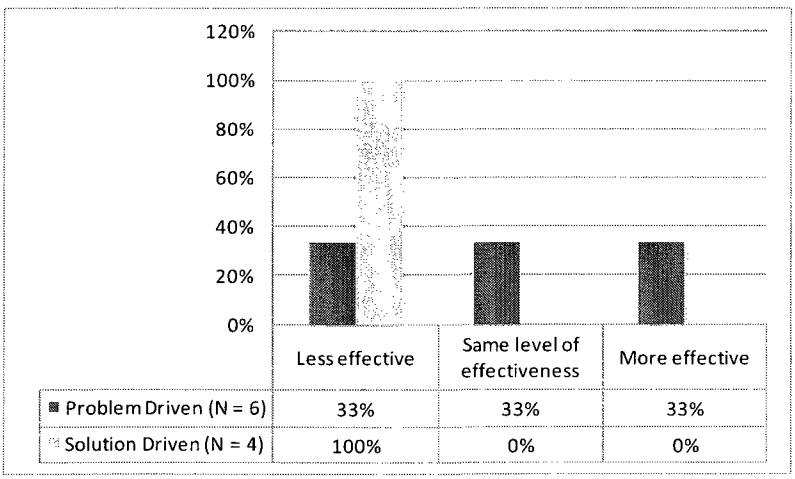


Figure 106: Cognition strategy groups by distant audience effectiveness (Aut)

9.8: Summary: perception-related variables

Perception-related variables (methods and method transparency, research team composition, sampling and sample size, presentation modes and audience distance) were researched to inform the second primary research question: What should UX researchers strive to understand about Designers to maximize the utility of personas and scenarios? The perception of personas/scenarios is an important aspect to the persuasiveness of the data and therefore has power to influence whether a real Designer will accept the role of the Mock Designer.

Perception-related variables were investigated through three modes: (1) all discussion with study participants in the task and preamble and all discussion with survey responders and study participants pertaining to past experiences were analyzed for unsolicited mention of the variables; (2) by analyzing the question in which survey responders and study participants were asked to generate factors that affect the quality of personas; and (3) questions pertaining to each perception-related variable were directly asked for further exploration (and presented in this chapter).

In an attempt to weight the perception-related variables, I attached a score to each variable based on the number of study participants and Designer survey responders who: (1) provided an unsolicited mention of the variables during the study preamble and task, and when discussing past persona experiences; and (2) included it in one of the generated factors, see Table 44. The weighting was based on the reasoning that an unsolicited mention of one of these variables measured the level of perception salience in Designers' minds. In the case of research method and research team transparency, I also had a measure of importance rated by the survey responders.

Table 44: Perception-related (research) variable saliency

	Number of Designers who provided an unsolicited mention	Number of Designers who included as a generated factor	**Unsolicited weight**	Transparency rated as 'important' or higher by survey responders	Total weight
Research methods and transparency	12	6	**18**	0.69	12.42
Research team	5	2	**7**	0.60	4.20
Sampling and sample size	3	6	**9**	N/A	N/A
Presentation	7	10	**17**	N/A	N/A

Based on these findings, research methods and transparency were the most salient perception-related variables followed by the presentation of the personas (display, content, quality and how the personas are communicated). Both the sampling/sample size and research team (composition and transparency) concerns did not appear to be as critical of factors for Designers when considering personas and scenarios. Audience distance is not included in the weighting above because the saliency was obviously a greater issue to the study participants. In the next sections, I summarize findings about each perception-related variable from each of the three modes of investigation in the order of their unsolicited weight (sections 9.8.1 through 9.8.4) followed by audience distance (section 9.8.5).

9.8.1: Research methods and research transparency

In the next sections, I present findings pertaining to: (a) the unsolicited mention of research, research methods and research transparency (section 9.8.1.1) ; (b) research methods and transparency as important factors affecting the quality of personas (section 9.8.1.2); and (c) summary findings from the questions asking about research methods and research transparency (section 9.8.1.3).

9.8.1.1: Unsolicited mention (research methods and research transparency)

A total of twelve different Designers provided an unsolicited concern about research or research transparency. Unsolicited mention of research methods or research transparency was investigated: (a) throughout the preamble and task portions of the

study; and (b) in the open-ended questions from the survey and participant discussion in the study pertaining to past persona experience.

9.8.1.1a: Preamble and task (study participants N = 10). The only mention of research and research transparency in the preamble and task portions of the study came from Maria. Recall, that in the preamble portion of the study, participants were given the research materials (including the personas and context scenarios) and asked to give me their impressions. Maria, (the only participant to address the persona documents as such) asked specifically if the personas were based on "*actual research.*" There were no unsolicited mentions about research or research transparency during the task portion of the study.

9.8.1.1b: Past experiences (N = 21). The five study participants (Leanne, Lucy, Marco, Maria and Hannah) and sixteen Designer survey responders were all asked about their past experiences with personas (and scenarios for Marco). In the next sections, I summarize the findings for the study participants first, followed by the survey responders.

- *Study participants*. All five of the study participants discussed research in some way when reporting about past persona experiences; however, there was a difference in how research was discussed related to the level of persona experience:
    - The three participants with the least amount of persona experience reported a lack of research. Leanne and Hannah reported their own experiences in creating personas in classroom experiences that were not based in research. Lucy described her own research methodology using her family as a sample.
    - Marco and Maria, the two participants with the most persona experience, frequently mentioned research and the importance of the perception of rigorous methods. "Research' was one of the first three things that Maria stated came to mind about personas.

Perception of rigorous research was important to both Marco and Maria when discussing their best and worst experiences.

- *Survey responders*. Seven different survey responders provided unsolicited feedback about the importance of research when discussing past experiences:
    - Five survey responders discussed a type of research method when asked to describe their last experience using personas.
    - Four survey responders discussed the perception that personas should be based on real data.

9.8.1.2: Generated factors (research methods and research transparency)

Six Designers focused on research methods or research transparency when asked to generate factors that would affect the quality of personas and scenarios. Research methods were mentioned by four Designers (Lucy, Maria and Howard) and survey responders (Respondent 040) and concerns about research transparency were mentioned by three of the study participants (Lucy, Lewis and Marco). None of the Designer survey respondents generated transparency as an important factor.

9.8.1.3: Summary findings from direct questioning (research methods and research transparency)

When asked directly about methods, most participants and survey responders mentioned qualitative methods more often as being appropriate for research for personas and scenarios. The most common method mentioned by all study participants and survey responders was interviews (35% of the combined Designer sample), followed by contextual inquiry or a concern that observational methods were used in the context of use (27% of the combined Designer sample). Surveys and focus groups were also commonly mentioned methods. This finding does not support the assertions made by other researchers (see Chapman & Milham, 2006; Khalayli, et al., 2007) that quantitative methods are needed to support believability.

Only survey responders were asked directly about the importance of method transparency. When asked directly about research transparency, it was considered 'very important' or 'important' by most (69%) of survey responders with Designer job titles. Designers who found transparency important suggested it was important to increase believability in a follow-up open ended response.

9.8.2: Presentation modes

In the next sections, I present findings pertaining to (a) the unsolicited mention of presentation (section 9.8.2.1); (b) presentation modes as an important factor affecting the quality of personas (section 9.8.2.2); and (c) summary findings from the questions asking directly about presentation modes (section 9.8.2.3).

9.8.2.1: Unsolicited mention (presentation modes)

Seven different study participants and respondents provided unsolicited comments or concerns pertaining to presentation modes. Three study participants (Leanne, Luke and Maria) provided unsolicited comments about the Kyrgyz personas and scenarios in the preamble portion of the study. Maria, Marco and Leanne also discussed presentation modes. Additionally, Marco and Maria focused on how personas were introduced to designers in the past in their discussion about their best and worst experiences. Finally, how personas were presented was discussed by three different survey responders when discussing their best and worst experiences.[75]

9.8.2.2: Generated factors (presentation modes)

Ten different Designers generated a comment or concern about presentation when asked to generate factors that affect the quality of personas/scenarios. The five study participants (Lewis, Malcolm, Marco, Heather and Hannah) who focused on presentation focused on different aspects of presentation. Concerns were about: (1) the

[75] There were additional survey respondents who wrote about presentation in their last experience ; however, I did not include these in the weight because the phrasing of the question encouraged responders to focus on presentation.

actual display of the fact sheets (Lewis and Malcolm); (2) the content, for example the inclusion of photos (Lewis, Heather and Hannah); and (3) the quality of the writing (Marco). Additionally, five submissions from survey responders contained concerns about presentation when asked to generate factors that affect the quality of personas.

9.8.2.3: Summary findings from direct questioning (presentation modes)

When asked directly about presentation modes, there were three areas of concern among the Designer groups. I categorized findings into three main areas of concern: (1) display; (2) content; and (3) communication.

9.8.2.3a: Display. Posters, PowerPoint slides and fact sheets were the most recommended formats. When presented with hypothetical alternate formats, most of the study participants were not encouraging (the only exception was for a visual storyboard layout (versus text) for the context scenarios); additionally, alternate formats were rarely mentioned by survey responders.

Other mentions of display included: (a) Lucy's complaint of the printer artifact lines that she felt undermined the professionalism of the documents; (b) changing paper sizes to afford more direct comparisons (Heather and Lewis) and to make the personas seem more unique (Lucy).

9.8.2.3b: Content. Two of the study participants (Lucy and Howard) suggested that the content provided by the Kyrgyz personas and scenarios was insufficient. Howard felt that the personas were too focused on prose stories and Lucy wanted more information about phones using the Cyrillic alphabet. Other suggestions for content considerations included a way to provide a more direct comparison of data points (Lucy, Lewis, Malcolm and Respondent 079).

9.8.2.3c: Communication. Maria, Marco and four survey responders focused on a need for formal presentations or meetings to communicate the personas/scenarios. Additionally, Respondent 079 suggested making the roll-out of personas/scenarios more interactive. A formal presentation was also associated with a high degree of organizational support by Maria and Marco.

9.8.3: Sampling and sample size

In the next sections, I present findings pertaining to: (a) the unsolicited mention of sampling and sample size (9.8.3.1); (b) sampling and sample size as important factors affecting the quality of personas (9.8.3.2); and (c) summary findings from the questions asking about the importance of sample size (9.8.3.3).

9.8.3.1: Unsolicited mention (sampling and sample size)

Three Designers provided an unsolicited mention of sampling or sample size. Two Designers provided unsolicited mentions of sample or sample size when discussing past experiences. Respondent 040 discussed sample size when he explained why he gave personas an 'effective' rating in his last experience when he wrote:

- "...talking directly to people we are targeting can be very helpful, but at the same time a small sample size is naturally limited in its effectiveness."

Additionally, Maria addressed sample size when she suggested that there is greater emphasis in industry for more rigorous methods when creating personas when she said:

- "Nowadays, people seem to want numbers behind the information."

Finally, Malcolm addressed sampling when directly questioned about research methods.

9.8.3.2: Generated factors (sampling and sample size)

A total of six Designers included sampling or sample size as concerns when asked to generate important factors that affect the quality of personas/scenarios. Three Designer participants (Maria and Howard from the study and Respondent 040 from the survey) identified sample size as a factor that would affect the quality of personas and scenarios. Two survey responders (Responders 079 and 070) and two survey participants (Lucy and Maria) were concerned about the composition of the sample. Finally, Leanne was concerned about the transparency of the sample suggesting that "*information about the people that were studied*" was an important factor.

9.8.3.3: Summary findings from direct questioning (sample size)

When asked directly about sample size, five (Leanne, Lucy, Malcolm, Marco and Howard) of the ten study participants suggested that sample size was important to the quality of personas and scenarios; however, only two suggested that it was important for Designers to be cognizant of the sample size (Leanne and Lucy). The survey did not directly ask respondents to rate the importance of sample or sample size.

Among the Designers who did identify a specific sample size, the most common range was more than five but less than fifteen (identified by three survey respondents and was the approximate range identified by Lucy, Heather and Hannah). The average level of professional experience among the group who gave specific estimates was less (five to seven years) than those who did not (seven to ten years). The difference was statistically significant. Additionally, solution-driven participants and responders were statistically more likely to give estimates.

The most identified dependency among the combined Designer group for sample size was the size and/or variability of the end user audience. This dependency was identified by Luke, Heather, Hannah and four survey respondents. This finding suggests that when discussing sample size dependency with Designers, the size and variability of the end user audience are salient concerns.

9.8.4: Research team

In the next sections, I present findings pertaining to: (a) the unsolicited mention of the composition of the research team (section 9.8.4.1); (b) the research team composition as an important factor affecting the quality of personas(section 9.8.4.2); and (c) summary findings from the direct questions about research team composition and transparency(section 9.8.4.3).

9.8.4.1: Unsolicited mention (research team)

Five Designers focused on the composition or transparency of the research team in unsolicited comments. Three Designers mentioned research team composition when

discussing past persona experiences. The importance of the credibility of the research team was evident in Respondent 019's explanation for why he gave personas an 'effective' rating for the last experience when he wrote:

- "Effectiveness was closely related to the experience of the person (researcher I guess) that produced the persona. They are not easy to create..."

Maria and Marco both discussed the importance of the composition of the research team. Marco claimed that if engineers were creating the personas he doubted the credibility. Maria stated that personas were more valid if created by "*actual masters or PhD in psychology or human factors*," when she discussed her worst and best experiences. Additionally, the importance of the research team was a salient consideration for Luke, Malcolm and Maria when later directly questioned about research methods.

9.8.4.2: Generated factors (research team)

Two Designers suggested that the composition of the research team was important when asked to generate factors that affect the quality of personas and scenarios (Howard and Respondent 019). Howard's discussion focused on the need for local researchers when designing for a distant audience and Respondent 019 wrote that "*experience of researchers and writers*" of personas and scenarios was one of the factors affecting quality.

9.8.4.3: Summary findings from direct questioning (research team)

When asked directly about research teams, most (seven of ten) of the study participants claimed to care about the composition of the research group. Salient qualities of the research group included education, level of experience, profession, and the size of the research group (i.e. at least two people for inter-rater reliability).

Among survey responders, 60% rated research group transparency as either 'important' or 'very important'. Reasons given for the importance of transparency focused on issues of believability and credibility. Reasons given for the non-

importance of transparency suggested that either: (a) methods were more important; (b) it depends on the skeptical level of the Design team; (c) the credibility of the end product (i.e. personas/scenarios) is dependent on the quality of the product alone.

9.8.5: Audience Distance

The perception of audience distance was investigated more thoroughly with the study participants because they were directly interacting with personas and context scenarios which represented a distant audience. In the next sections, I present findings pertaining to: (a) the unsolicited mention of the distant audience by study participants (section 9.8.5.1); (b) the distance of the audience as an important factor affecting the quality of personas (section 9.8.5.2); and (c) summary findings from the direct questions about how distant audience issues are perceived by Designers (section 9.8.5.3).

9.8.5.1: Unsolicited mention (audience distance)

Eight of the ten participants mentioned some salient unsolicited factors about audience distance in either the preamble, task, or debrief portion of the study. Only two participants, Hannah and Luke never: (a) mentioned or focused on language differences; and (b) never presented questions that focused on possible differences between designing for the Kyrgyz audience versus a local audience. As discussed in Chapter 7, these two participants had two additional things in common. First, Hannah and Luke had the highest possible HCD orientation alignment scores, which indicated a high awareness of HCD principles. Second, Hannah and Luke were the only design study participants who suggested that they would consult end users if they could have done something different in the task.[76]

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[76] Recall that my hypothesis was that when Hannah and Luke indicated that they wanted to bring in users it may have been an indication that they were ignoring the distant audience as a variable. In other words, the differences between an audience in Kyrgyzstan and in Seattle were not highlighted in their minds. Luke supported this hypothesis in his solution in which he suggests that Shirn searched for a restaurant in Seattle; in other words, the distance did not occur to him. In Hannah's case, as a highly

9.8.5.2: Generated factors (audience distance)

Three study participants mentioned the audience distance when asked to generate factors that would affect the quality of personas and context scenarios (Lewis, Heather and Howard). Lewis focused on the need for supplemental information that was provided about Kyrgyzstan. Heather made many references to the audience distance including this comment about technology level of the personas:

- "I had such a hard time figuring that out, but it was good that was here. That's a cultural thing that I don't understand."

Finally, Howard stated that, "*Well, this is . . . it's for a culture that's much different than ours*," when asked about important factors effecting persona/scenario quality.

9.8.5.3: Summary of findings from direct questioning (audience distance)

Findings are summarized in three sections: (1) summarized findings from the study participants; (2) combined findings of effectiveness from survey responders and study participants; and (3) relationships among effectiveness ratings and other designer-related variables.

9.8.5.3a: Study findings (N = 10). Study participants had a range of responses when considering differences between using personas/scenarios representing a familiar audience with those who represent an unfamiliar audience. Expected changes included: (a) content changes; and (b) research changes.

Two participants (Maria and Leanne) suggested that more context would be required when personas/scenarios depicted a distant audience. Howard felt that the content would need to be more general in the case of a more distant audience.

Several participants focused on differences in the research due to audience distance. There were three types of research changes suggested: (a) the designer

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experienced information architect, she may have simply felt it was irrelevant to the mechanics of the interaction design; as such, she ignored the distance.

relationship to the research; (b) the reliability of the underlying research; and (c) the researcher and/or designer relationship to the audience.

- *Relationship to research.* Maria wanted more direct contact with the raw data while Heather wanted to conduct the research herself.
- *Reliability of the underlying research.* Both Lewis and Luke felt that it would be more difficult to do research on people with autism suggesting that the personas/scenarios would not be as accurate and less 'reliable'.
- *Research team/ Designer relationship to the audience.* Malcolm felt that the personas/scenarios representing office workers in Seattle would be more accurate because of the assumed similarities among the researchers and the end user audience. He had a different reaction to the personas/scenarios representing teens with autism; he suggests that he would have more in common with the autism audience thereby making the documents equally effective:

9.8.5.3b: Effectiveness. There were three major findings related to effectiveness. First, the unfamiliarity of the audience was a salient concern. Second, the two types of distance (geographical versus psychological) were not rated evenly. Third, more distance was perceived for the autism audience; i.e., the psychological distance was seen as a larger gap than the geographical and cultural distance.

9.8.5.3c: Relationships among effectiveness ratings and other designer-related variables. I looked for patterns among the ratings and other Designer-related variables and two patterns were found. First, the number of projects in which personas were used was significantly associated with the rating groups for the Kyrgyzstan mobile user comparison. This suggests that more experienced Designers familiar with personas/scenarios may feel that they are going to get more effective information when dealing with an unfamiliar audience. Second, there was a clear pattern among the design cognition groups when considering persona/scenario effectiveness between teens with autism and office workers in Seattle. While the difference is not significant,

100% of the solution-driven group found the personas/scenarios describing teens with autism less effective; the problem driven group was evenly distributed in its effectiveness ratings.

9.9: Next steps

This chapter explored variables related to the perception of the personas (and context scenarios for study participants). These are important factors to consider because they influence the persuasiveness of the documents and have power to influence whether a real designer will accept the role of the mock designer. The findings presented here provide an idea of what Designers find important when considering UX research presented in personas. The next chapter explores the claims and criticism of personas and scenarios in depth (Chapter 10).

Chapter 10 Results: Outcomes of persona and scenario use: claims and criticisms

Recall that proponents argue that personas are effective at helping Designers create a mock-user construct because personas: (1) provide a clear *focus* of the user audience ; (2) facilitate improved *communication* about users; (3) increase *empathy* with the user; and (4) act as an aid for *avoidance of ill- informed assumptions and stereotypes* of users. The reasons personas fulfill these enthusiastic claims, proponents argue, is due to the human ability to engage with fictional characters. In this chapter, I present findings from queries that investigated these claims in greater detail. Section 10.1 presents the findings from survey responders and study participants (with multiple persona experiences) who were asked to explicitly rate their level of agreement to the claims. In section 10.2, I describe study participant reaction to four question sets which attempted to implicitly measure the degree to which personas meet their claims. In section 10.3, I review and summarize all the evidence supporting the claims and criticisms that were found in the design study and follow-up survey responses. Finally, in section 10.4, I outline the next steps for the final discussion in Chapter 11.

10.1: Claim investigation via explicit questions

Survey responders and study participants (with multiple persona experiences) were asked to explicitly rate their level of agreement to the persona claims. In section 10.1., I review the question and data analysis procedures. In section 10.1.2, I present the findings and in section 10.1.3, I summarize the results.

10.1.1: Questions and data analysis procedures

The questions asked are reviewed in section 10.1.1.1. Data analysis procedures are described in section 10.1.1.2.

10.1.1.1: Question procedure.

Study participants and survey respondents were asked to rate on a scale of 1-5 their level of agreement to four statements meant to measure explicit agreement to the persona claims.[77] The statements were phrased:

- Personas help me have more empathy with the perspective of a user (measuring increased empathy, score of five supported empathy)
- Personas help me focus on specific users (measuring clearer focus, score of five supported focus).
- Personas help me communicate better about users to other members of the design and development team (measuring increased communication, score of five supported communication).
- Often, I find that personas describe users that are *exactly* like I had imagined even before I was given any user research (measuring the avoidance ill-informed assumptions and stereotypes, a low score of one supported stereotype avoidance).

Additionally, survey responders were asked their level of agreement to an additional statement that was intended to further explore if personas were effective at replacing ill-informed assumptions and stereotypes:

- I have *never* been surprised by the depiction of a user described by a persona (measuring the avoidance ill-informed assumptions and stereotypes, low scores of one or two supports stereotype avoidance).

10.1.1.2: Data analysis procedure

For the analysis, I combined the findings from the two study participants with multiple persona experiences (Marco and Maria) with those of the survey participants for a final sample of $N = 34$ (Designer $N = 18$, UX Centric $N = 16$). I first compared ratings between the two job title groups. I also investigated associations among claim ratings and Designer-related independent variables for the Designer survey responders and the two study participants using non-parametric statistics.

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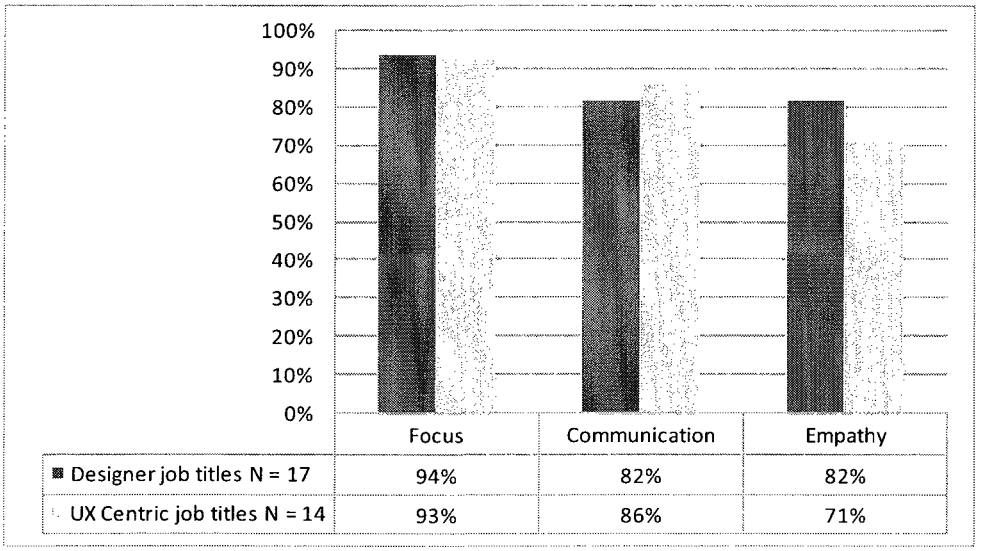
[77] The same statements were asked of scenarios; however, I am not reporting on those findings because of the non precise definition of scenarios.

10.1.2: Findings

In this section, I first present how participants and respondents explicitly rated the claims (section 10.1.2.1). Next, I present the findings of the investigation of associations among the claim ratings and other Designer-related independent variables (section 10.1.2.2).

10.1.2.1 Descriptive findings

Marco, Maria and most of the survey respondents 'agreed' or 'strongly agreed' that personas met three of the four claims when asked explicitly: (1) 94% agreed that personas help with clearer focus; (2) 82% agreed that personas help facilitate communication about end users; and (3) 82% submitted that personas help Designers empathize with end users, see Figure 107. Responders with UX Centric job titles also expressed a strong level of agreement to all claims, differing most with the Designer group in agreement to the empathy claim; differences between the Designer and UX Centric groups were not significant.



	Focus	Communication	Empathy
Designer job titles N = 17	94%	82%	82%
UX Centric job titles N = 14	93%	86%	71%

Figure 107: % of respondents/participants who agreed/strongly agreed claims

However, the results from the questions aimed at exploring if personas were effective at avoiding ill-informed assumptions or stereotypes was not as clear. More

than half (60%) of Designers claimed that they had *never* been surprised by a depiction of a user described by a persona and 41% felt that personas had described users *exactly* like the users they had imagined, see Figure 108. While the differences were not significant, UX Centric responders were much less likely to agree. This makes logical sense, since UX Centric responders would be reticent to think that the personas they had created were exactly like users Designers already imagined or that the personas had never surprised Designers. These findings also indicate some support for the flip side of stereotype/assumptive avoidance; i.e., the criticism of stereotype confirmation is somewhat supported. In other words, if somewhere between 40-60% of Designers had never been surprised then they are likely applying previous assumptions to the personas. However, we do not know if previous assumptions were actually ill-informed.

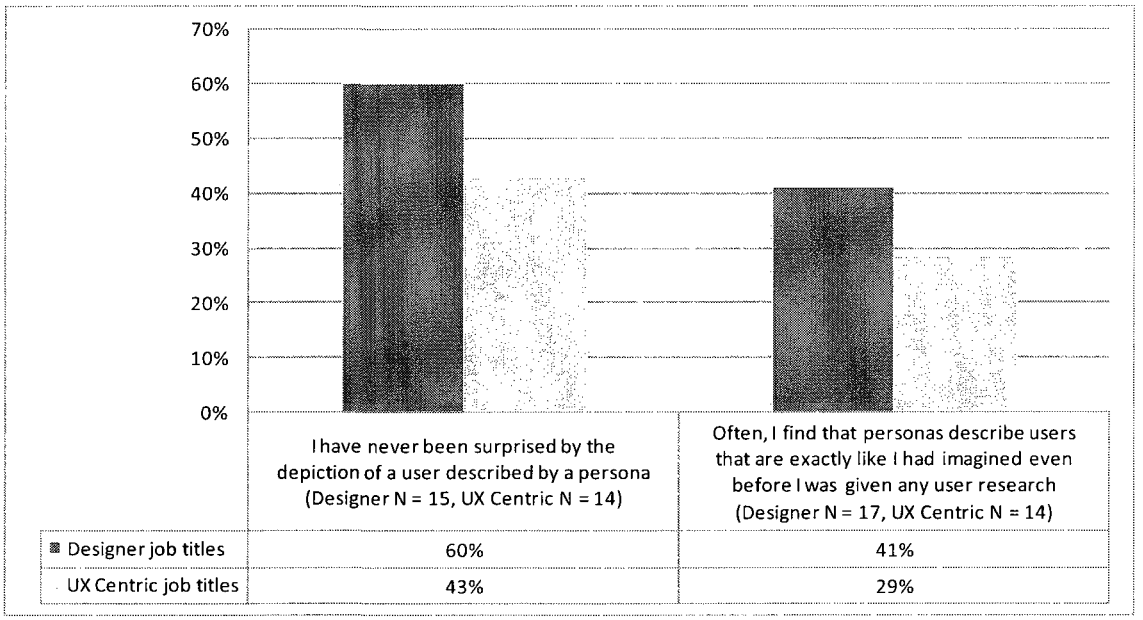


Figure 108: Questions investigating ill-informed assumptions/stereotype avoidance

10.1.2.2: Association among claim ratings and Designer-related independent variables.

To determine if the reported level of agreement to beneficial claims was associated with other Designer related variables, I conducted a series of non-parametric

statistical tests for all claims except for focus.[78] I also looked for patterns that did not necessarily reach the level of statistical significance and noted any test that achieved a .10 level as an area of interest.

First, I reduced the empathy, communication, and the two questions aimed at investigating the avoidance of ill-informed assumptions into three levels (agree and strongly agree as level one, neutral as level two, and disagree and strongly disagree as level three). Isolating only the Designers responders, I used the three level coding as a grouping variable to conduct the statistical tests on five constructs[79]: (1) professional profile (years of experience and job title); (2) personal profile (age and gender); (3) HCD orientation (number of projects in which personas were used and the HCD orientation alignment score); (4) empathetic profile scores; and (5) design cognition strategy.[80]

10.1.2.2a: Professional profile. There was only one pattern of any meaning found among the professional profile variables (years of experience and job title). The more years of professional experience, the less likely the respondent was in agreement to the statement, "often, I find that personas describe users that are *exactly* like I had imagined even before I was given any user research." The average years of experience for the group that agreed to the statement was between three-five years; the average years of experience for the group that disagreed was over ten years. The differences were significant at the higher .10 level: χ^2 (2, N = 17) = 4.87, p = .088. This finding suggests that Designers with less experience may be more susceptible to the stereotype confirmation criticism.

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[78] Only one Designer respondent did not agree with the claim of focus (Respondent 104); as such, patterns in the data were not available.

[79] I used the three group coding as a grouping variable and conducted Kruskal-Wallis tests for continuous variables (age, years of professional experience, empathy scores, number of projects in which personas had been used, and HCD orientation alignment score) and Chi-square test for categorical variables (cognition strategy, job title, and gender).

[80] I used a Bonferroni adjusted alpha for each construct for actual statistical significance.; however, I also noted patterns that did not reach the level of statistical significance.

10.1.2.2b: Personal profile. There were two patterns of interest associated with gender. First a significant pattern associated with gender and agreement to the claim of communication, χ^2 (1, N = 17) = 6.68, p <. 025. All three of the respondents who were neutral with the claim were female (no respondents disagreed with the claim of communication).

Second, there were no female Designer responders (N = 5) who disagreed with the statement that they had *never* been surprised by a persona, χ^2 (2, N = 15) = 6.00, p = .050. Two females were neutral on the statement and three agreed. This finding indicates that females may be more susceptible to the stereotype confirmation criticism.

10.1.2.2c: HCD orientation. There was one pattern of note (not significant for the construct) associated between the HCD orientation alignment score and agreement to the statement that they had never been surprised by a persona, χ^2 (2, N = 15) = 6.24, p = .044. Not surprisingly, those that agreed to the statement (N = 9) had a much lower HCD orientation alignment score (M = 1.22, SD = 1.39) than those that disagreed (i.e. they had been surprised), (N = 4, M = 3.75, SD = .500). (Three respondents and Marco were neutral). This suggests that greater alignment to the Gould and Lewis principles was associated with the ability to have been surprised by a persona depiction and therefore may be less susceptible to the stereotype confirmation criticism.

10.1.2.2d: Empathy dimensions. There was one pattern of note found among the empathy dimensions and the agreement to claims. Those that scored higher in the perspective taking (PT) dimension were more likely to disagree with the statement that they had never been surprised by a persona, χ^2 (2, N = 17) = 4.76, p= .093. Those that disagreed with the statement (N = 4) had a mean PT score of 17.5, while those that agreed with the statement (N = 9) had a mean score of 16.8. The overall PT mean for Designers (survey responders only) who answered this question, N = 15, was 16.9. This finding suggests that higher PT scores may be associated with a lower level of susceptibility to the stereotype confirmation criticism.

10.1.2.2e: Cognition Strategy. There was one significant pattern with cognition strategy and the answer to the question, "I have *never* been surprised by the depiction of a user described by a persona," χ^2 (2, N = 8) = 4.80, p = .091. All respondents who self-identified as solution-driven (N = 3) agreed to the statement. This pattern suggests that Designers who identify as solution-driven may be more susceptible to the stereotype confirmation criticism.

10.1.2.2f: Summary: claim associations and patterns. There were several patterns of interest associated with questions targeted at establishing agreement to claims and Designer-related independent variables. The patterns were associated with three of the following statements: (1) Personas help me communicate better about users to other members of the design and development team; (2) Often, I find that personas describe users that are *exactly* like I had imagined even before I was given any user research; and (3) I have *never* been surprised by the depiction of a user described by a persona.

- *Personas help me communicate better about users to other members of the design and development team*:
    - Females were less likely to agree to this statement;
- *Often, I find that personas describe users that are exactly like I had imagined even before I was given any user research:*
    - Designers with more experience were less likely to agree to this statement;
- *I have never been surprised by the depiction of a user described by a persona:*
    - Males, and those with (a) high HCD orientation alignment scores; (b) high scores in the perspective taking dimension of empathy; and (c) had a self identified problem-driven strategy were less likely to agree to this statement.

10.2: Claim investigation via implicit questions

In attempt to further measure whether personas (and if context scenarios helped) meet their claims, I asked four sets of questions of the study participants in which each question set targeted a particular claim. I present the findings from these questions in the order in which they were asked. I start with questions aimed at exploring the capacity to avoid ill-informed assumptions and stereotypes (section 10.2.1), followed by empathy (section 10.2.2), communication (section 10.2.3) and focus (section 10.2.4).

10.2.1: Stereotype Avoidance

Recall, throughout the analysis of study participants' discussions, I coded for discussion that expressed surprise about the Kyrgyzstan people in which a previously held stereotype or assumption appeared to be changed. I differentiated between three types of surprise: (1) surprise deriving from a realization that the user was not like them (surprise type I); and (2) surprise deriving from a realization that the user was similar to them (surprise type II); and (3) surprise deriving from a realization that the Kyrgyzstani people were different from a previously held stereotype about the population (surprise type III). (Often I did not have enough information to determine the surprise type). The first two types are based on using oneself as the point of reference. The latter assumes an existing framework from which one has drawn assumptions; this was difficult to ascertain in the study because none of the study participants expressed significant previous knowledge about Kyrgyzstan. However, in asking this set of questions, it became quite clear that some participants *did* have assumptions about people in the region that were not apparent when asking an explicit question. In the next sections, I explore those assumptions. In section 10.2.1.1, I review the question and data analysis procedures; in section 10.2.1.2, I present the findings; and in section 10.2.1.3, I summarize the results.

10.2.1.1: Question and data analysis procedures

The questions asked are reviewed in section 10.2.1.1. Data analysis procedures are described in section 10.2.1.2.

10.2.1.1a: Question procedures. Recall that in the original interview protocol I was going to ask participants if their initial assumptions about Kyrgyzstan were confirmed by the personas and context scenarios; however, none of the participants were familiar with the region and did not voice assumptions in the preamble. Instead, study participants were asked if they were surprised about what they learned about mobile users in Kyrgyzstan. This question exposed many of the assumptions that they did have about Kyrgyzstan, the population, and the culture.

10.2.1.2: Data analysis procedures. In an attempt to code the responses, I first listed what participants were surprised about and then categorized the surprises into the three surprise categories. When it was obvious, I also noted the origin of the assumptions.

10.2.2.2: Findings

In the next sections, I present the discussion with each participant (section 10.2.2.2a – j). The discussions began after I had asked "Were you at all surprised about what you learned about mobile phone users in Kyrgyzstan?"

10.2.2.2a: Leanne. Leanne's idea about Kygyz people was largely based on what she had learned from books; she discussed two books in the interview specifically, 'Two Cups of Tea" by by Greg Mortenson and David Oliver Relinand 'The Kite Runner' by Khaled Hosseini. Most of her assumptions were about the capital city of Bishkek (in which two of the personas lived) and the Kyrgyz culture. She was surprised about: (1) the Asian appearance of the personas, thinking that they would look more Russian (type III surprise); (2) that the capital city (Bishkek) would be modern enough to support Internet cafes and an American University (type II or III surprise); and (3) that anybody in a mostly Muslim country would drink alcohol (type III surprise).

Leanne	Sure. I guess when I first heard, I thought it was some kind of country in the old Soviet Union.
Cynthia	So you were thinking Soviet Union? *(Note that she did not say this in the preamble).*
Leanne	....you know, stan. But I just never heard of Kyrgyz...And, I guess I was thinking about 'Three Cups of Tea'*(referring to the book)* so I was thinking of the villagers that he described and then I saw these and I guess they were, more Asian than Muslim, or something...? I don't even know if that's a real different...So, that did not...did surprise me just gave me information I did not know. .. Otherwise, I did not know that there was a large enough city there for there to be, I don't know, internet cafes sound very urban...Roza, I suppose, probably mostly confirmed my, like, you know, very village-based social white face-to-face social networking and got me thinking that mobile phones could affect culture in ways. I didn't look to find much about their lives...this did not mean anything to me...
Cynthia	What didn't mean anything to you?
Leanne	Oh. The personas income... It wasn't dollars.
Cynthia	Okay. It sounds like you were surprised about some of the things that you learned; that you didn't know there would be a city large enough to have an Internet cafe, or that the people are more Asian than you would expect... Was there anything else that was surprising about your exposure to Kyrgyz people?
Leanne	This American University of Central Asia.
Cynthia	Okay. There would even be one there?
Leanne	Yeah. Or, bartenders. ...I'm assuming that means serving alcohol. And if they're Muslim, I suppose maybe, like, some urban homes drinking alcohol's okay. I don't know. There's, like, varying degrees of how Muslim they are... probably right....? I mean I wouldn't say I have, like, a huge, you know, a huge existing knowledge of this area. And obviously I didn't even know that the country existed.

10.2.2.1b: Lucy. Lucy's surprises focused on technology. In the following exchange, she established that she did not have any existing framework informing her

about the region; however, she was surprised about the high use of mobile phones (type II and type III) and that the use of the Internet was so low (type I).

Lucy	Yeah, actually.
Cynthia	Tell me what you were surprised about.
Lucy	Well,..I feel so ignorant...but I really don't know very much at all about that part of the world.
Cynthia	Oh, hardly anybody does. It doesn't make you ignorant at all.
Lucy	I thought it was interesting that the phones, especially when I looked at the graph, the phone usage versus internet and computer…
Cynthia	Crazy, huh?
Lucy	. . . it's, that's nuts.
Cynthia	So, that surprised you?
Lucy	It very much surprised me.
Cynthia	That the phone use is going through the roof, or that the other technologies are relatively flat?
Lucy	Well, I guess, the combination of both. If they're gravitating toward phones and not toward computers.

10.2.2.1c: Lewis. Lewis was not surprised about anything he learned about Kyrgyzstan. In the following exchange he suggested that he did not have any assumptions about Kyrgyzstan; however, he implied that he thinks they are very much like people in the United States.

Lewis	No. Actually, it's pretty close to what happens in America.
Cynthia	Okay. So, you weren't that surprised.
Lewis	Not at all.
Cynthia	It's like, these people seemed like people in the US. They just happen to live in Kyrgyzstan.
Lewis	Yeah. Uh huh.
Cynthia	Okay. Did you have any initial assumptions about people in Kyrgyzstan that were changed, that were modified at all?
Lewis	I didn't have any assumptions about people in Kyrgyzstan.

10.2.2.1d: Luke. Earlier in the session, Luke had suggested that he was surprised at the high literacy rates in the region (type III surprise, in that, he expected

them to be more illiterate). He expanded his surprise to include the high use rate of mobile phones (type II or III surprise).

Cynthia	You said that you were surprised that they were literate before....Were you at all surprised about what you learned about mobile users from Kyrgyzstan?
Luke	Uh huh. Yes.
Cynthia	And besides being literate, was there anything else that just, kind of, like jumped off the page at you?
Luke	Just how many of them use mobile phones.
Cynthia	Okay. And, so, thinking a little bit more about what surprised you or anything else? Anything else that you'll walk away here and go, wow, I didn't know that about this country? Or, I didn't even think about this country before, now I know this?
Luke	No. It's just this.

10.2.2.1e: Malcolm. Malcolm's response was unique among the study participants. He was not surprised about any of the data because he did not feel that the data was 'real'. From what I could ascertain, he felt that 'real data' would be associated with a large investment of money and that the circumstances of the study did not indicate such an investment.

Malcolm	I can't say I was surprised. ... But I wasn't totally sure . . . I wasn't convinced that this was real facts. ...So, I might have been surprised if, one, if I though, okay, I'm looking at real data, and, two, it said something like, some people spend 30% of their monthly income on their cell phone bill, or something that would be surprising. You know?
Cynthia	Okay. So, you weren't convinced it was real data? Was it the circumstances of this particular exercise that made you not think it was real data?
Malcolm	Yeah. I mean, you did not bring me into a focus group that I thought was, you know, was a straight focus group, or something like that. ...So, I wasn't sure that, you know, . . . Because it looks like, you know, if this was real data, these people spent a lot of hours and money developing this data. So, they

must really be planning on investing a bunch of money in this business.

10.2.2.1f: Marco. In this very short exchange with Marco, he suggests a surprise about the growth of mobile phone use (type II or type III) and the low rate of computer use (type I).

Marco	Yes...that is a five.
Cynthia	Five. Okay. And the thing that surprised you the most was . . . ?
Marco	The percentage of the increase in the three-year span. That was pretty impressive. Especially related to computer use.

10.2.2.1g: Maria. Maria also focused on technology-related surprises. She was surprised that the personas used mobile phones (type III), which suggests an existing framework.

Maria	Yes.
Cynthia	Okay. What were you surprised about?
Maria	That they would use it *(referring to the mobile phone)* as I would use the internet, to get business information and ratings...I go to like Yelp.com to get readings from average users, or, you know, people in that neighborhood.

10.2.2.1h: Heather. Heather had a previous experience in Vladivostok, which provided a framework for her assumptions coming into the design session. These previous assumptions led to surprise about how modern Bishkek appeared to be (type III surprise).

Heather	I think there were surprises. My other remembrance from doing this project that I did where I had to ship stuff to Vladivostok, which is very close, one of the images that I used was of this man who was just beautiful and he was dressed in native costume. ...And these people are all contemporary *(referring to the personas).*

> ...And he still lived out in the woods somewhere--God knows where-and lived a very, very ancient life, basically. And he was so beautiful. But these people are all contemporary. And I know Vladivostok at least and I think it's in, as you said, Kazakhstan. *(It is actually in Russia)* It's a very . . . It's quite a modern city.
> ....I would have thought it to be much less modern, just because of where it's located.

10.2.2.1i: Hannah. Similar to Heather, Hannah was surprised by: (1) how modern (progressive) the people seemed to be (type II or III); and (2) the existence of Internet cafes (type III) in the city. Both of these assumptions are possibly based on previous stereotypes/assumptions; however, Hannah did not describe the origin of her previous framework.

Hannah	I was surprised kind of surprised about the social aspect...they were more progressive than I would have thought... ....I was surprised I never heard of these computer clubs. That was kind of interesting. ....that they have the computer games clubs. ...But that was, kind of, different from what I would have thought....
Cynthia	Okay. So, that was another surprise? The prevalence of Internet cafes?
Hannah	And the fact that they have old equipment. So, once their equipment breaks, they're basically out of business, it sounds like.
Cynthia	So, that surprised you as well?
Hannah	Yeah.
Cynthia	Okay. Anything else?
Hannah	No.

10.2.2.1j: Howard. Howard (like Marco) was surprised by the high rate of mobile phone use in the region, especially when compared to the low Internet rates. While the high mobile rates appear to be a type III surprise, he did not talk about the origin of his assumptions. The low Internet rates were codes as a type I surprise.

Howard	Yeah. I mean, I knew it was . . . I knew the general geographical area and the ethnicities, I guess.

	... And, I guess I wasn't a little surprised by the language. ...I guess there was no surprise demographically or such. ...I guess the only surprise was the cell phone use. But then I remembered that in Africa it was becoming much more of a cell phone-using . . . So, I guess that doesn't surprise me after a second thought.
Cynthia	All right. So, at first you were surprised about how many people used cell phones?
Howard	Yeah. Yeah. And, I guess I immediately was extrapolating to 2009 and realized it was over 100% as well. So, that surprised me quite a bit too.
Cynthia	Okay.
Howard	And the lack of the Internet use ...

10.2.1.3:Summary

There were two findings that could be generalized to other situations in which personas and context scenarios are used. First, even when Designers claim to have no knowledge of a population, there is an existing framework from which they are drawing (sometimes ill-informed) assumptions. While this statement seems obvious, it is an important aspect of communicating about a distant audience that UX Researchers need to consider; i.e., no one is a blank slate even when previous knowledge is limited. Additionally, there were several type III surprises which by their definition require a framework other than oneself to create. Only two participants, (Lewis and Malcolm), claimed to not be surprised by anything they had learned. I interpret this to mean that they were relying on themselves as a framework; however Malcolm's reasoning seemed to be unrelated to previous assumptions that he had about Kyrgyzstan and the Kyrgyz people.

Second, personas and context scenarios appear to help most designers avoid some ill-informed assumptions and stereotypes; eight of the ten participants provided evidence that the information contained in the personas/context scenarios helped them re-consider at least one ill-informed assumption. Whether any of the assumptions were critical to the actual design is debatable. However, displaying the capacity for surprise

does suggest that the personas provided new information; information that may not have aligned to a previous assumption.

There were also specific findings related to a Designer in Seattle, Washington interacting with personas and context scenarios depicting people in Kyrgyzstan; these findings might generalize to a similar distant audience. In sum, most of the surprises were based on assumptions that the Kyrgyzstan people would be less modern and less technical, see Table 45.

Table 45: Surprises by type

	Technology surprises				Surprises about the city/country / culture/people	
	Lack of Internet use	High rates of mobile phones	How moble phones might be used	Existence of Internet Cafes	High modernity level of the city / people	Other
Leanne				Type III	Type II or Type III	Type II: Common Asian look, Alcohol availability
Lucy	Type I	Type II or Type III				
Lewis						
Luke		Type II orType III				Type III: High literacy rates
Malcolm						
Marco		Type II or Type III				
Maria			Type III			
Heather					Type II or Type III	
Hannah				Type III	Type II or Type III	
Howard	Type I	Type II or Type III				Type III: Language
Total	**2**	**4**	**1**	**2**	**3**	

The most common area of surprise was the high rate of mobile phone use. This surprise was expressed by four of the ten participants (Lucy, Luke, Marco and Howard). This area of surprise was either based: (a) on the assumption that people in Kyrgyzstan would not be using mobile phones (type III); or (b) based on the assumption that Kyrgyz people would not be at all like them and therefore not use mobile phones, (type II, in that, he was surprised at how much they were like him).

The second most common area of surprise was in how modern the city, or people (and dress) appeared to be. This area of surprise was expressed by Leanne, Heather and Hannah. In the case of Leanne and Heather, this was likely a type III surprise because both had discussed an existing framework from which they derived their ideas (for Leanne it was in books and for Heather it was a previous experience in what she considered to be a nearby city). However, the surprise about modernity could have been based on an assumption that the Kyrgyz people would be different from themselves and they were surprised how alike they were (type II surprise).

There were two areas of surprise each shared by two participants. First, the existence of Internet cafes was a surprise expressed by two participants (Leanne and Hannah). I interpreted this as a type III surprise because it was based on the assumption that this population would not be technical. Finally, a lack of Internet use (type I) was a surprise expressed by both Lucy and Howard.

10.2.2: Greater Empathy

Recall that Webster's dictionary defines empathy as "the projection of one's own personality into the personality of another in order to understand him better; ability to share in another's emotions or feelings"(Guralinik, 1976). In Chapter 3, I also discussed how Grudin & Pruitt (2002) contend that personas take advantage of our ability to "extrapolate from partial knowledge of people to create coherent wholes" which in turn forms a "holistic image of the user in the mind of the designer, that the designer can mentally transport into new situations and settings." This focuses on a complex dynamic in the persona claims.

To "extrapolate from partial knowledge' requires one to make assumptions; as such, for empathy not to produce unwanted persona use outcomes (i.e. stereotype confirmation), it is imperative that personas also help Designers reconsider ill-informed assumptions and stereotypes. The claim of greater empathy, therefore, is somewhat dependent on an avoidance of ill-informed assumptions/stereotypes; otherwise, an empathetic engagement with a persona will lead to the criticism of stereotype

confirmation. In other words, empathy needs to be constrained by informed assumptions for personas to meet their claims and avoid their criticisms.

In the next sections, I present findings from the questions intended to explore the claim of empathy. Question and data analysis procedures are summarized in section 10.2.2.1, findings are presented in section 10.2.2.2 and summarized in section 10.2.2.3.

10.2.2.1 Question and data analysis procedures

The claim of greater empathy was explored by asking the participants two sets of questions. The first question set was about a scenario involving the Roza persona. I worded the question as: "Roza does not drive and she relies on a network of local minibuses and they're called Mashrukas. There's no published bus schedule and oftentimes if a bus is full it won't even stop. Can you talk about what challenges she might face getting to town for a scheduled meeting?" This question asked participants to put themselves in a difficult situation faced by the persona and infer a solution. I coded for: (a) if the participant had direct experience in which they were drawing from; and (b) what type of empathy the participant appeared to employ when discussing Roza's challenges; i.e., whether the participant took an intellectual approach (perspective taking), or if they spoke about how Roza was feeling (emotional concern).

Next I asked, "What kinds of solutions do you think would help Roza?" Answers were coded for: (a) what type of solution (i.e. use of social network, technical solution, etc); and (b) was the solution viable based on information that was available to them in the documents. In other words, were their solutions driven by the information contained in the personas and context scenarios?

The second set of questions explored how comfortable the participants were in transferring knowledge about the personas to a new situation; i.e., "extrapolating from partial knowledge of people to create coherent wholes." I asked participants if they thought: (a) Parxat, Shirn or Roza would enjoy travel: (b) if yes, where would they like to go; and (c) how confident they were of that answer. Answers were coded for: (a) which persona did they focus on; (b) where they thought the persona would like to go;

(c) their confidence level in their answer; and (d) did the participant venture a guess and what did they use as the basis for their decision. In other words, I coded for if their answer was based on information contained in the documents or if they were using a different framework.

10.2.2.2: Findings

In the next sections I present the findings for each participant in two parts, separated by the question sets (sections 10.2.2.1a-j).

10.2.2.2a: Leanne.

- *Roza scenario: Can you talk about what challenges she might face getting to town for a scheduled meeting?* Leanne had personal experience riding buses and encountering frustrations. She implied an emotional connection to Roza when she suggested that Roza would "*get stressed out.*" Leanne's solution was technical in nature, suggesting a call-in phone service; the service was viable based on information available in the documents.

Leanne	Sure. I mean, it's kind of like Seattle, unfortunately. I guess challenges would be, you know, she'd get to the bus stop and she wouldn't know if the bus has come early or is running late. There probably isn't a bus schedule posted..it's probably torn down. And she probably did get stressed out wondering if she should walk to the next bus stop, or just keep walking, or find another way, or call somehow to let them know that she'll be late. Or, she also may be wondering, should I walk to the other bus, because maybe that one's coming ....close enough. Or, maybe that one as well has stopped running, or will never run, or will just pass me by. Who knows *(laughs).*
Cynthia	Sounds like it's coming from a lot of personal experience.
Leanne	Yep.
Cynthia	What kinds of solutions do you think would help Roza?
Leanne	In being able to call a number and get accurate real-time bus information.

- *Travel Scenario. Do you think that Parxat, Shirn or Roza would enjoy travel?* Leanne focused on Shirin suggesting that she would like to come to the United States because she was a student. I coded Leanne's answer as tenable based on the information available to her.

Leanne	I think Shirin would. ....And maybe Parxat...yeah...not sure
Cynthia	So, where do you think she would like to go?
Leanne	Probably she would like to go to the United States. ....If she is a student.
Cynthia	On a scale from one to five, how confident are you about that answer? Five being really confident.
Leanne	Five.

10.2.2.2b: Lucy.

- *Roza scenario: Can you talk about what challenges she might face getting to town for a scheduled meeting?* Lucy also had personal experience riding the bus; unlike Leanne, she did not suggest an emotional state for Roza. Her suggested solution that Roza rely on her social network was tenable based on the information available to Lucy.

Lucy	Being able to get on the bus.... ...Oh, I've been there, actually. You know, being able to catch the bus in time. Knowing when the bus is going to arrive, if it's going to arrive at all.... ...If it's going to stop. If there will be a seat for her.
Cynthia	So, what kinds of solutions do you think could help Roza?
Lucy	Find a friend with a car. ...Find somebody who knows what the schedule is. Even a ballpark figure of when is going to arrive is better than nothing at all.

- *Travel Scenario. Do you think that Parxat, Shirn or Roza would enjoy travel?* Lucy also focused on Shirin and suggested that she would like to go someplace fun and suggests that the United States, Europe and

Australia are fun; this conclusion is tenable based on the information she had about Shirin. Recall that one of the Shirin context scenarios discusses a paintball game involving her boyfriend.

Lucy	I think Shirin would enjoy travel.
Cynthia	Okay. And where do you think she'd like to go?
Lucy	I think she'd like to go maybe to some place young and fun, like, maybe Europe or the US or Australia.
Cynthia	On a scale of one to five, five being the most confident, about how confident do you feel about that answer?
Lucy	Three.

10.2.2.2c: Lewis.

- *Roza scenario: Can you talk about what challenges she might face getting to town for a scheduled meeting?* Lewis also has an intellectual response to Roza's situation and suggests that a solution based on the MoSoSo social directory would be in order. I coded Lewis's solution as tenable based on the available information.

Lewis	Well, she's going to need to ensure her transportation.
Cynthia	Okay. Can you talk a little bit more about that?
Lewis	Well, if she was able to use the directory, she might be able to get an update on the bus schedule and the traffic, you know, the amount of users on the bus at any given time, so that she could make a decision as to when to leave so that she can make it for her appointment.
Cynthia	That's great...a directory...what else might help?
Lewis	Yeah. Well, she would be part of the social directory, part of a group, based on the bus system. ....Like, we use the metrokc.gov to analyze our ability to get to somewhere on time by using their time schedule.

- *Travel Scenario. Do you think that Parxat, Shirn or Roza would enjoy travel?* Lewis's response suggested that he had a framework about the personas based on the available information. While he did not venture a guess for Parxat, he felt like Shirin would want to go someplace fun and

exciting. Lewis's assumptions were tenable based on the information that he was given.

Lewis	I don't think Roza would so much. ...But I think Parxat would, as long as he wasn't away from his business too long. And, Shirin, she's just a free spirited kid.
Cynthia	So, where do you think Parxat would like to go? What country do you think Parxat would like to visit?
Lewis	No idea.
Cynthia	What about Shirin? Any idea where she . . . ?
Lewis	She's go anywhere, you know, that was fun and exciting.
Cynthia	Okay. So, on a scale of one to five, about how confident do you feel about your answers regarding their desire to travel?
Lewis	Oh...five.

10.2.2.2d: Luke.

- *Roza scenario: Can you talk about what challenges she might face getting to town for a scheduled meeting?* Luke also has an intellectual response to Roza's situation and suggested a taxi instead. I coded this as non-tenable based on the information he was given and he was applying a 'Seattle' solution to the problem; in other words, he was not thinking about Roza's context and how expensive taxis might be in Bishkek.

Luke	She would have to start her day early. I need to make sure that she gets there on time, because of how unreliable that transportation service is.
Cynthia	Okay. Anything else?
Luke	No.
Cynthia	Okay. What kinds of solutions do you think would help Roza?
Luke	She can take a taxi....?

- *Travel Scenario: Do you think that Parxat, Shirn or Roza would enjoy travel?* Again, Luke applied his own framework to the question, when

he suggested that the personas would like traveling to the United States because he would want to.

Luke	Yeah...?
Cynthia	Okay. And where do you think they'd like to go?
Luke	Probably anywhere that they've never been before. Probably the United States. ...I would want to go to the United States.
Cynthia	And who do you think would want to go the most?
Luke	Probably Roza.
Cynthia	Okay. And on a scale of one to five, how confident do you feel about that answer?
Luke	Five.
Cynthia	Five. Very confident?
Luke	Yeah.

10.2.2.2e: Malcolm.

- *Roza scenario: Can you talk about what challenges she might face getting to town for a scheduled meeting?* Once again, Malcolm provided a unique answer, providing an emotional response based on an entirely different scenario. His suggested solution of micro-loans (see below) was completely unrelated to any of the information that was provided to him in the documents.

Malcolm	I don't really know what more needs to be said other than what you already said. ....I'm more concerned about her, you know, getting to a hospital when she goes into labor. ...Because that's a real scenario for my friends in Shorka, Ethiopia. ...You know, they've got . . . They can only drive five an hour on the road or it'll break an axle. It's not a paved road. ....So, there are no buses.
Cynthia	So, you have friends in Ethiopia that you feel are, kind of, in that same boat?
Malcolm	Yeah. Once removed. I mean, I've got a friend who in five days built a hospital and a clinic, who was my client. He built a hospital and a clinic in Ethiopia. And, you

	know, seriously, even if they had an ambulance, it could take them a long time to get to the hospital, because the roads just aren't paved.
Cynthia	So, what kinds of solutions do you think would help Roza in that situation?
Malcolm	Kiva. Micro loans. ...KIVA.
Cynthia	Okay. Why would she want a micro loan?
Malcolm	Well, I'm not exactly sure she would want a micro loan, but somebody might start a taxi business or....

- *Travel Scenario: Do you think that Parxat, Shirn or Roza would enjoy travel?* Malcolm did not answer this question directly; instead, he suggested that the personas were too impoverished to think about travel.

Malcolm	I'm sure they would enjoy travel, but I'm not sure they're at that level of Maslow's hierarchy.
Cynthia	Okay. That's fair. And, do you think one of them would enjoy travel more than the others?
Malcolm	What are you saying here? I can't exactly say. I totally love travel, and I'm a pilgrim. And I'm sure people have to have their basic necessities taken care of first before they can enjoy travel, but I'm sure they would appreciate it if there were better public transportation to their urban areas, and hospitals, and such.
Cynthia	Okay. All right. So, you're just not sure if anyone would enjoy travel.
Malcolm	Sure. They would all enjoy travel, if they knew that, you know, their bills were going to be paid, I mean I would enjoy traveling, if I knew that my rent was going to be paid at the end of the month.
Cynthia	So, on a scale of one to five, about how confident do you feel about that answer?
Malcolm	Oh, that's a ten.
Cynthia	A ten. On a scale of one to five. Okay.

10.2.2.2f: Marco.

- *Roza scenario: Can you talk about what challenges she might face getting to town for a scheduled meeting?* Marco had an intellectual

response but his solution was so vague I did not code it for viability based on the information contained in the personas and context scenarios.

Marco Well, I think she'd have to anticipate delays. So, she would have to, you know, . . . If she wanted to be on time for her meeting, she'd have to actually leave early.

Cynthia Okay. What kinds of solutions do you think would help Roza?

Marco Hm. If there was a way for the buses to notify her, you know, if they're full, if they're on schedule, if the guy who is full could just, you know, let her know how much time until the next one. Yeah. Any solution that I see would just more be, you know, kind of, like, technologically-based.

- *Travel Scenario: Do you think that Parxat, Shirn or Roza would enjoy travel?* Marco felt confident enough to venture a guess and his suggestion of nearby locations is tenable based on the information he had available.

Marco It seems like the social . . . I forgot her name.

Cynthia That's all right. You can refer to her as social.

Marco The social user.

Cynthia Okay. And where do you think she'd like to go?

Marco It seems like there are a lot of countries nearby, so, I think it would just be, you know, the immediate region.

Cynthia Okay. And on a scale of one to five, how confident are you with that answer?

Marco Maybe, like, a four.

10.2.2.2g: Maria. Introduction

- *Roza scenario: Can you talk about what challenges she might face getting to town for a scheduled meeting?* Maria had an emotional response suggesting that Roza would be feeling a lot of stress. Maria made a series of suggestions, most of which were tenable based on the information she had about Roza.

Maria She might miss the bus; not be able to show up. Those are the challenges. The stress of not knowing how to get there. The stress of unreliable transportation.

Cynthia What kinds of solutions do you think would help Roza in that situation?

Maria She does not drive, so she won't have the option of getting a zip car. If this is a really important thing she has to go to all the time, I would recommend living closer to that place.
...Something like, you know, bike to that place, or walk there. Second, finding friends who have cars who can take her there. Not everybody has that luxury; knowing friends who would drive them, like, 23 miles to wherever this place is. Taxis. I don't know if that's an option. As well as finding a similar business closer to where she lives.

- *Travel Scenario. Do you think that Parxat, Shirn or Roza would enjoy travel?* Maria did not think that the personas would like to travel. Her conclusion were based on information that was available to her.

Maria No. I think they are comfortable with their community. I think it seems to be, like, a place where you're really close to your friends and family.
...It seems really close-knit; the community.

Cynthia Okay. And, on a scale of one to five, five being the most confident, how confident do you feel about that answer?

Maria Three.

Cynthia Three. Okay. And, you were saying that they seemed really close-knit. Where did you pick up the idea that they were really . . .

Maria Oh, the personas.
....It's not always just them, solo. They're always, like, interacting with somebody else whose close to them.
...Like email with their friends at school, or her husband, or a business associate. There's always like a personal relationship going on.

10.2.2.2h: Heather.

- *Roza scenario: Can you talk about what challenges she might face getting to town for a scheduled meeting?* Heather had an emotional response as well, tempered by an intellectual reasoning that Roza would

not be frustrated anymore because she would be used to the difficult situation. While in reality her solution would not have required a GPS enabled phone, she suggested that it would; therefore, I coded her solution as non-tenable based on the available information. It was made explicitly clear to all participants that the personas used older non-smart phones during the preamble portion of the session. Additionally, all pictures of the personas with phones were of older phones.

Heather She would have to leave real early.
....She probably will endure a lot of frustration.
....But she's probably used to it, so maybe she's not frustrated by it anymore. We would be. I forget how far out she was. She was pretty far out, too, wasn't she? Did it say where she lived?

Cynthia Kara Balta, which is 30 miles away ...I think.

Heather Yeah. So, it's not like she can walk it if, you know. She doesn't have many options. She has very few options I think. If she needs to be somewhere for a meeting, she's got to deal with the buses. And her options are the bus, so she's got to figure out some way to work around it.

Cynthia What kinds of solutions do you think could help Roza?

Heather Well, this is an idea that actually we have here now for the buses where you can . . . I forget what the service is called, because I don't take the bus. You can be standing at a bus stop, which you said she would be, and there's a little, it's a GPS controlled thing in the bus. And you can say: number 42, and your phone tells where you are, because you have to have a GPS phone to work this. So you punch in number 42 after you go to this website and it tells you exactly how many minutes it will be before number 42 arrives at your stop.
....Now, I don't know what that system is called. I just read about it a while ago.

- *Travel scenario: Do you think Parxat, Roza or Shirin would enjoy travel?* Heather focused primarily on the Shirin persona, suggesting that she would enjoy travel as a student. Heather's reasoning was in line with the information provided by the personas and context scenarios.

Heather Yeah.
...Yeah. All of them would enjoy travel?
...I think these two particularly.*(Shirin and Parxat)*
...I don't know about Roza.

Cynthia So, where do you think that they would like to go?

Heather She's young. *(indicating Shirin)*
...I can see her completing her degree and wanting to go somewhere to work.
...That might be within Russia. It might be a larger city within Russia. It could be almost anywhere, because she's young and she's free.
...And she can go where she wants. She has a boyfriend. They might go together. And she works where she could meet some people who maybe are visiting there, who could talk to her about possibilities. So, I think she has an easier way of reaching out, clearly than Roza does. He is sort of family-bound, *(indicating Parxat)* but he has a good degree. He has good degrees.
....And, so, he might be interested also. Whether the opportunity would open up-because maybe he'd have to take his whole family-I don't know.

Cynthia Okay. So, on a scale of one to five, five being the most confident, how confident do you feel about those answers.

Heather About four.

10.2.2.2i: Hannah.

- *Roza scenario: Can you talk about what challenges she might face getting to town for a scheduled meeting?* Hannah has an intellectual response, admitting to limited local knowledge about buses. Her solutions were tenable based on the information she had available.

Hannah Well, I mean, there's always a possibility that she's not going to be able to make it, so she's going to have to plan, like, way ahead to make sure that's she's, like, you know, . . . whenever she thinks the bus is going to be there, try to get there, you know, two bus stops earlier to make sure that if one's full that she can catch the next one.

Cynthia Okay. And what kinds of solutions do you think would really help Roza?

Hannah Well, of course...a published bus schedule would help.

Cynthia It would help.

Hannah I think that there is some way for her . . . I don't know if there is any way like that. I don't know if there is any way in our society for people to be able to find out when a bus route is, you know, not running, or when a bus route is full. I don't think they have it for full. I think they do 'not running' postings, but not 'full.' I don't ride the bus myself, so I don't know too much about that.

- *Travel scenario: Do you think Parxat, Roza or Shirin would enjoy travel?* Hannah focused on Shirin but did not want to venture a guess as to where she would like to go. However, her understanding about Shirin is based on the information available to her in the documents.

Hannah Yeah. I think that Shirin seems like she would like to.

Cynthia Where do you think she would like to go?

Hannah You know, I don't . . . I don't remember enough of her background.

Cynthia That's okay. It's fine. You can just say, "I don't know."

Hannah Yeah. I don't really know, but it just seemed like she was a very social person and she wanted to reach out and, you know, make new friends. And she wanted to use these groups in order to do that. So, I just think a little bit more desire... wanting to get out and, you know, culture herself with other people.

Cynthia Okay. And on a scale of one to five, five being very confident, how confident do you feel about that answer?

Hannah I think, three...?

10.2.2.2j: Howard.

- *Roza scenario: Can you talk about what challenges she might face getting to town for a scheduled meeting?* Howard had an intellectual response and like Lewis suggested an adaptation of the MoSoSo directory as a solution. His solution is viable based on the information available to him.

Howard Wow. Well, it would be quite significant, since she couldn't rely on ever actually getting to the meeting, unless, of course, it's within walking distance. But if she's rural, it most likely isn't. I guess the first thought for me was that it would be fairly . . . It's an untenable situation if you're trying to get to a meeting.
...Having a . . . She has a very close network though, obviously, so perhaps she can help with that, or that can help. Maybe the bus is full. Maybe somebody else has a truck and is heading to town for supplies or something. Maybe she has some likelihood of getting a ride that way.
....You can't just always walk. But, you know, that would be pretty significant.

Cynthia Can you think of some other solutions that might help Roza?

Howard Well, I mean, obviously the MoSoSo application would...
...Well, I mean, the situation where we have now with . . . we can find out when our buses are arriving within the moment.

Cynthia I know. It's amazing isn't it?

Howard Yeah. I guess she could, if there was a-what do you call them?-directory, private directory for that bus line, that bus . . . the driver can signal when it's full.
....And she gets broadcasted when it's full, so she doesn't have to wait outside for it. Or that could queue up another bus, who wasn't running, because he didn't think he could make any money that day, to start running the route. So, she may have to wait an hour for the next bus to get there, but she could get another bus, because the next driver thinks he might be able to make enough money picking up people.

- *Travel scenario: Do you think Parxat, Roza or Shirin would enjoy travel?* In the following exchange, Howard is uncomfortable making assumptions about the personas. While he answers the question using information that was available to him, he expressed no confidence whatsoever in his answer.

Howard Oh, I would imagine they would. Sure.

Cynthia	Do you think all of them would enjoy traveling?
Howard	I think there's a general common like of seeing something new. ...I guess I shouldn't paint that on everyone, but I think it's a fairly common . . . ...I don't know Roza personally, so I don't know for sure.
Cynthia	So, where do you think . . . ? Let's just take Shirin. Where do you think she would like to go visit?
Howard	I would throw out Moscow or St. Petersburg. ...I think she speaks . . . Oh, no, she doesn't speak Russian.
Cynthia	I think she does. Yeah.
Howard	Oh, does she?
Cynthia	Yeah. It's just not a primary language.
Howard	Oh, she can speak and read fluently. I see. ...Yeah. So, I would imagine that those would be very fun cities to visit. ...Especially for a 20-year-old, isn't it? Yeah.
Cynthia	And on a scale of one to five, five being the most confident, how confident do you feel about that answer?
Howard	Well, no confidence whatsoever.

10.2.3.3: Summary

I present the summary in two sections: the Roza scenario (section 10.2.3.3a) and the travel scenario (section 10.2.3.b).

10.2.3.3a: Roza scenario summary. Most respondents (six of ten) displayed an intellectual (perspective taking) response to Roza's dilemma; see Table 46 for a summary of responses. Three participants (Luke, Malcolm and Heather) suggested solutions that were not tenable in Roza's situation. Luke suggested that Roza take taxis; Malcolm suggested micro loans for a taxi company; and Heather suggested that Roza would need a GPS enabled phone in concert with GPS enabled buses[81]. Recall, that these are the same three participants who provided evidence of stereotype confirmation in the task debrief portion of the design study. This finding suggests that

[81] Note, that the GPS solution for buses would have been practical if Heather had suggested a text-based interface.

the empathy these participants employed throughout the study was not constrained by well-informed assumptions.

Table 46: Summary empathy for Roza's scenario

	Encountered a similar situation?	What type of empathy?	Suggested solution.	Was the solution viable based on information available in the documents?
Leanne	Yes, personally	Emotional	Technical, phone call in service	**Yes**
Lucy	Yes,	Intellectual	Rely on social network	**Yes**
Lewis	Not clear	Intellectual	Technical, use the MoSoSo directory	**Yes**
Luke	Not clear	Intellectual	Rely on other services: taxi	**No**
Malcolm	Yes, through a friend	Emotional but not for Roza; he describes an	Rely on other services: Micro-loans for someone else to start a taxi service	**No**
Marco	Not clear	Intellectual	Technical: create a notifying service	Not clear
Maria	Not clear	Emotional	Rely on social network or rely on other services like taxis	**Yes,** at least partially.
Heather	Not clear	Emotional/ Intellectual	Technical: create a GPS system for the buses	**No,** solution relied on GPS phone
Hannah	No bus experience	Intellectual	Technical: add notification on the bus	**Yes**
Howard	Not clear	Intellectual	Rely on social network or rely a technical solution based on the MoSoSo directory	**Yes**

10.3.3.3b: Travel scenario summary. Almost all the participants focused on Shirin's travel (seven of ten), see Table 47. When asked to identify where Shirin might want to go, there were three clusters of answers: (1) Hannah did not want to venture a guess; (2) Leanne, Lucy and Lewis (all from the low experience group) suggested that Shirin would want to go someplace in the Western world; and (3) Marco, Heather and Howard felt that she would want to go someplace more local, (although Howard had no confidence in his choice). Five of the seven participant's who focused on Shirn cited her young age and student status as reasons for their location choice. These answers

surfaced a common assumption that younger people would be more likely to enjoy travel; this may or may not be ill-informed.

Table 47: Summary empathy for the travel scenario

	Who does the participant focus on?	Where would they like to go?	Confidence	Did they venture a guess? What did they use as the basis for their decision and was it contained in the personas?
Leanne	Shirin	United States	**5**	**Yes,** based location on Shirin's student status
Lucy	Shirin	US, Europe or Austrailia	**3**	**Yes,** based location on Shirin's age
Lewis	Mostly Shirin	Someplace 'fun and exciting'	**5**	**Yes,** based location on Shirin's age
Luke	All	United States	**5**	**No,** assumed they would want to go to the states because that is where he would want to go.
Malcolm	All	Unclear; does not feel the personas are at that level of 'Maslow's hierarchy'	**5**	**No,** extrapolation unclear.
Marco	Shirin	Immediate region	**4**	**Yes,** extrapolation unclear.
Maria	All	They would not like to travel	**3**	**Yes,** based decision her feeling that they are too close knit to enjoy travel.
Heather	Shirin	Someplace for school but focuses locally	**4**	**Yes,** based location on Shirin's student status
Hannah	Shirin	Does not want to guess	**3**	**No,** did not want to venture a guess
Howard	All, but I asked him to focus on Shirin	Cities in Russia	**0**	**Yes,** based location on Shirin's age

Two participants (Malcolm and Luke) gave reasons for their answers that were based on an ill-informed assumptions. Luke felt that all the personas would want to come to the United States because that is where he imagined he would want to go. Malcolm was non-specific expressing his assumption that none of the personas were in a life situation that would make travel a possibility. Recall, that these are two of the three participants who provided: (a) evidence of the stereotype confirmation criticism in the task debrief; and (b) suggested non-tenable solutions to Roza's dilemma. Furthermore, Malcolm was one of the two participants to express no surprise about anything he learned, suggesting that he did not believe the information contained in the

personas and context scenarios was factual. Combined, this finding suggests the claim of empathy has at least three dependencies.

First, as discussed previously, empathy needs to be constrained by well-informed assumptions or it will lead to stereotype confirmation. Second, the personas must be believable and persuasive documents for empathy with personas to be possible. Third, Designers must have the capacity to engage with the fiction presented by the personas. Recall that Malcolm had the lowest score in the fantasy dimension of empathy which may be related to the capacity to engage in the fiction of the personas. Two of the other three low scorers in the fantasy dimension (Heather and Luke) also consistently provided evidence of stereotype confirmation. Malcolm also had the highest score in the empathetic concern dimension, suggesting that the capacity to emotionally feel connected to others may be less important than the ability to engage with fictional characters when it comes to empathetically engaging with personas using well-informed assumptions.

10.2.3: Increased Communication (and Focus)

Recall that the claim of communication contends that personas provide a communication channel for conveying a wide range of quantitative and qualitative data (Pruitt & Grudin, 2003); clear communication in turn facilitates consensus and efficiency in team decision. Since this was not a team exercise, I did not observe whether the personas and context scenarios helped in team decision making. However, I did ask two sets of questions intended to measure if the participants had a clear enough understanding of the personas to communicate some simple facts about them to me. These questions also measured a level of focus.

Throughout the dissertation, I identified evidence for the claim of focus in comments or notes that were directed at separating the needs of the users by the persona groups presented in the research materials. Additional persona claim interdependency surfaced; to communicate clearly about end users first requires an understanding of how user needs were differentiated by user segments. In other words,

clearer communication is not possible without focus. As such, the questions targeted at investigating the claim of communication also measured focus.

Question and data analysis procedures are outlined in the next section (10.2.3.1). This is followed by findings (section 10.2.3.2) and a summary (section 10.2.3.3).

10.2.3.1 Question and data analysis procedures

The questions asked are reviewed in section 10.2.3.1a. Data analysis procedures are described in section 10.2.3.1b.

10.2.3.1a: Questions. Two question sets were asked of study participants in an attempt to ascertain if personas help facilitate communication about end users. In the first set of questions I asked, "Without referring back to the personas, can you tell me how often each of them uses text?"[82] I then asked for a confidence measure on a scale of 1-5 how they felt about their answers. In the second set of questions I asked, "Without referring back to the personas, can you tell me how often each of them uses the Internet?"[83] This was also followed by a confidence measure.

Texting and Internet use were chosen because they had a direct association to the interaction that the participants were asked to design. As such, they would be likely facts in which study participants would have some familiarity. Additionally, the fact sheet clearly demonstrated a low Internet usage rate as one of the primary reasons for a text-based system.

10.2.3.1a: Data analysis procedures. I analyzed answers to determine if the participants had a sufficient level of understanding to confidently communicate facts about the personas. Answers were coded for: (1) participant capacity to speak about

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[82] Parxat used his phone a few times a day, and used text 30% of the time (estimate texting at once every few days). Shirin used her phone several times a day and texted about 20% of the time (estimate texting at once or twice a day). Roza did not use text. Accurate relative answers would be Shirin the most, Parxat second and Roza not at all.

[83] Parxat used the Internet 1-2 days a week. Shirin used the Internet about once a week. Roza did not use the Internet. Accurate relative answers would be Parxat the most, Shirin second and Roza not at all.

the personas and at least guess about the answers; (2) their level of confidence; and (3) how accurate their answers were. I was only looking for approximate accuracy; relative answers were fine. Accuracy was estimated as low medium and high (scored as 1,2,3) and judged liberally; accuracy was only judged low if the participant gave grossly inaccurate estimates combined with inaccurate relative estimates. I also determined a confidence to accuracy ratio.

The confidence to accuracy ratio was an estimate of their overall ability to competently communicate facts about the personas. If a participant, for example, had a low accuracy answer (a score of one), but their confidence was high (four or above), the ratio was 4/1. I combined ratios for both answers and a combined ratio totaling more than 2 was considered over-confident, ratios between 1.5 and 2 were considered an accurate level of confidence, and ratios below 1.5 were considered under-confident.

10.2.3.2 Findings

In the next section I present the findings from each participant (sections 10.2.3.2a-j). The exchanges began after I asked the first question "without referring back to the personas--can you tell me how often each of them uses text?"

10.2.3.2a: Leanne. Leanne used the persona names and communicated clearly about relative differences in persona text and Internet use. She is less accurate about the Internet use but also indicates a lower level of confidence. As such I judged her accuracy to confidence ratio as neither under nor over confident.

Leanne	Okay. Shirin the most. I don't even know if Parxat does. Maybe he knows how to do it, or something like that. And Roza does not.
Cynthia	Okay. Now, a scale of one to five, with five being very confident, how do you feel about that answer?
Leanne	Five.
Cynthia	Without referring back to the personas, how often does each of them use the Internet?
Leanne	Shirin probably the most...you mean...?
Cynthia	This is fine. Relative is fine.
Leanne	Okay. Parxat while he's a work. And Roza...two times a week...?

Cynthia	Okay. And how confident are you of that answer?
Leanne	Four. Because I don't actually think that Roza does.

10.2.3.2b: Lucy. Lucy also used the persona names and communicated clearly about texting and Internet use. Her accuracy was medium; however, her confidence levels were low. As such, I estimated her confidence to accuracy ratio as under-confident.

Lucy	Oh, let's see. Roza I don't think used text at all. I want to say Shirin did . . . ...a ton of texting. ...And Parxat, I think if I remember correctly he was open to it, but he wasn't a hardcore texter.
Cynthia	Okay. And about how confident do you feel about that answer, from one to five?
Lucy	Oh, probably about a three.
Cynthia	All right. Without referring back to the personas, how often does each of them use the Internet? Just approximate is okay.
Lucy	Roza doesn't use it. Parxat, he didn't have . . . I don't think he had internet yet. ...But I want to say he probably had used it before. Shirin ....I honestly don't remember.
Cynthia	Okay. And on a scale of one to five, how confident do you feel about those answers?
Lucy	Two.

10.2.3.2c: Lewis. Lewis claimed to have no idea about the persona capacity to text and use the Internet. The personas failed in Lewis's case to provide an adequate level of user understanding to ascertain and communicate simple facts. Recall that Lewis spent the least amount of time with the personas in the preamble (about 2.5 minutes); he also self-identified as the most extreme version of a solution-driven strategist.

Lewis	No idea.
Cynthia	Without referring back to the personas, can you tell me about how often each of them uses the internet?
Lewis	Not sure....sorry.

10.2.3.2d: Luke. Luke used the persona names to confidently communicate facts about texting and Internet use of the personas. However, Luke's accuracy was low to medium and his confidence was fairly high. As such, I estimated Luke's accuracy to confident level as over-confident.

Luke	Oh. Okay. Well, Roza doesn't . . . I don't think she would use it at all. ...And then, Parxat, he probably uses it one or twice every day.
Cynthia	Okay. And what about the third one?
Luke	She probably uses it, like, five to ten times a day.
Cynthia	Okay. And about how confident do you feel about that answer?
Luke	Five.
Cynthia	Five. Okay. So, without referring back to the personas, about how often does each of them use the internet?
Luke	Parxat, probably a couple of hours. ...Shirin, three plus hours.
Cynthia	This is per day?
Luke	Per day. Yes. ...And Roza, not at all.
Cynthia	Okay. And how confident do you feel about that answer?
Luke	Four.

10.2.3.2e: Malcolm. Malcolm used the persona names to discuss their relative texting and Internet use. His accuracy was low to medium but his confidence was high; as such I determined that he was over-confident.

Malcolm	Oh, yeah. I think I can tell you precisely in that Roza uses text three to five times . . . Oh, no. Wait a second. I think Roza uses her cell phone only three to five times a week, but she doesn't text. ...And Parxat . . . Is that his name? I have to check his name. He's more like three to five times a day. ...And then the third person, Shirin, was somewhere in the median.

Cynthia	Okay. And, on a scale of one to five, five being the most confident, how confident do you feel about that answer?
Malcolm	Well, that's a four.
Cynthia	Without referring back to the personas, how often does each use the internet? Approximately.
Malcolm	Well, Roza does not use the internet. ....Parxat is using the internet, I think, daily. ....And, again, those are the two extremes. And then, Shirin would be somewhere in between.
Cynthia	And how confident do you feel about that? From one to four.
Malcolm	I'm going to say, four.

10.2.3.2f: Marco. With Marco, I neglected to ask him to rate the second question; therefore I could not give Marco a confidence to accuracy score. Marco usually communicated about the personas by identifying roles (rather than their names). His answers were judged at about a medium level of accuracy.

Marco	Yeah. It seems like the social user uses it a lot. ...Roza, I think, very rarely it seems like. ...And it seemed like the game store owner would use it an average...
Cynthia	Okay. On a scale of one to five, how confident are you about those answers?
Marco	Well, about a four.
Cynthia	Without referring back to the personas, how often does each of them use the internet?
Marco	Based on the fact sheet, I would probably say all of them use it very little. ...But it seems like the game store owner would use it more.

10.2.3.2g: Maria. Maria also identified the personas by role rather than by name. Maria felt uncomfortable guessing Internet use for the Shirin persona because of her lack of cultural knowledge, suggesting a distant audience issue. Maria's accuracy was medium and her confidence was average; as such, she was judged as neither over or under confident.

Maria	Oh. Okay. The housewife: she doesn't text message. The student: it seems like she does a text message at least a dozen times per day. And, for the businessman: it seems like he would text message maybe, like, a few times per day.
Cynthia	Okay. And on a scale of one to five, five being the most confident, how confident do you feel about that answer?
Maria	Four.
Cynthia	Four. Okay. Without referring back to the personas, how often does each of them use the Internet?
Maria	The housewife, Sheryl...? In the personal statement, I believe the businessman doesn't have access to the internet, so he would be zero. And the student: well, I don't know anything about this culture, but maybe a few times per week. Maybe at the Internet cafe or at school.
Cynthia	And how confident do you feel about that?
Maria	Three to four.

10.2.3.2h: Heather. Heather very confidently used the persona names and communicated clearly about the personas. Her accuracy was gauged at about a medium level; however her confidence was high. As such, I determined that she was slightly over-confident.

Heather	Shirin, daily. ...Roza, as needed. ...And I would guess that Parxat would be daily also.
Cynthia	Okay. And on a scale of one to five, how confident are you on that one?
Heather	Five.
Cynthia	And without referring back to the personas, about how often does each of them use the internet?
Heather	Roza, never. ...Parxat, probably daily. ...And Shirin, daily.
Cynthia	Okay. And about how confident are you of that on one to five.
Heather	Four to five.

10.2.3.2i: Hannah. Hannah used the persona names and communicated about end users clearly. Her answer accuracy was medium and her confidence was average. As such, she was neither over or under confident.

Hannah	Yeah. Roza, basically, was none at all. ...Shirin, I don't know how many times a week it was. I don't know. So, I was say, you know, say, you know, maybe, I don't know, once a day, maybe. ...And Parxat seemed to use it quite a bit for his business... several times a day.
Cynthia	Okay. And on a scale of one to five, about how confident do you feel about that?
Hannah	About three.
Cynthia	About three. And without referring back to the personas, about how often does each of them use the internet?
Hannah	Well, Roza was none. ...I can't remember how many Parxat since he owns a computer club he probably uses it every day. ...And Shirin, I can't remember ...so just like maybe every other day.
Cynthia	Okay. About how confident do you feel about that?
Hannah	Again, about, I don't know, three.

10.2.3.2j: Howard. Howard clearly communicated about the personas and differentiated among them by name and role. His accuracy for texting was high, and judged at a medium level for Internet use. His confidence was lower than the accuracy of his answers and was judged as slightly under-confident.

Howard	Okay. So, Roza doesn't use it at all. ...I know Shirin does. She uses it socially. ...And Parxat discovered he had to use text when he was setting up his business. ...So, that suggests that he probably doesn't use it a lot, but he's capable of it. But, of course, again, I don't know for sure.
Cynthia	Okay. So, on a scale of one to five, about how confident do you feel about that answer?
Howard	Much more confident. Sure. I feel probably a four. ...Because you told me in the profile.

Cynthia Without referring back to the personas, how often does each of them use the internet?

Howard Oh, um. Roza, does on a shared computer, infrequently. Parxat just got his system networked, but he . . . he's got a computer club, so I'm going to suppose that he uses it more. I don't recall Shirin's, but I speculate much more than the other two.

Cynthia Okay. And on a scale of one to five, how confident are you about . . . ?

Howard Let's give it three on that, because I don't remember.

10.2.3.3 Summary

All participants (except Lewis) demonstrated an ability to communicate about the personas either by name or by role and clearly differentiated among the user groups suggesting strong support for the focus and communication claims, see Table 48.

Table 48: Summary results for communication questions

	Texting			Internet use			
	Did they communicate about the personas?	Con-fidence	Accuracy	Did the they communicate about the personas?	Con-fidence	Accuracy	Confidence /accuracy ratio
Leanne	Yes, used the names of the personas	5	3 -(relative estimate)	Yes, used the names of the personas	4	2- (relative estimate)	9/4 = 1.8
Lucy	Yes, used the names of the personas	3	2- (over estimate)	Yes, used the names of the personas	2	2 - (under estimate)	5/4 = 1.25 - Under - confident
Lewis	No			No			N/A
Luke	Yes, used the names of the personas	5	2- (over estimate)	Yes, used the names of the personas	4	1-(over estimate)	9/3 = 3 - Over confident
Malcolm	Yes, used the names of the personas	4	1- (over estimate)	Yes, used the names of the personas	4	2 - (over estimate)	8/2 = 4- Over confident
Marco	Yes, referred to Roza by name and the others by role	4	2- (relative estimate)	No, referred only to Parxat by role	N/A	Med (relative estimate)	N/A
Maria	Yes, referred to them by roles	4	2 -(over estimate)	Yes and no, referred to them by roles but mixes up Roza and Shirin's names	3 to 4	2 - (relative estimate)	7.5/4 = 1.9
Heather	Yes, used the names of the personas	5	2- (over estimate)	Yes, used the names of the personas	4 to 5	2 -(over estimate)	9.5/4 = 2.4 - Over - confident
Hannah	Yes, used the names of the personas	3	2 -(over estimate)	Yes, used the names of the personas	3	2 -(over estimate)	6/4 = 1.5
Howard	Yes, used the names of the personas	4	3 - (relative estimate)	Yes, uses the names of the personas	3	2 - (relative estimate)	7/5 = 1.4 - Under - confident

Seven of the ten participants used all three persona names in their discussions. Seven of the ten also were able to provide a fairly accurate understanding of the persona text and Internet use, at least in relative terms.

However, among the six participants to provide more than a relative estimation of texting and Internet use, all overestimated texting and five overestimated Internet use. This was an indication that while the participants could focus and communicate about end users, they were not accurately envisioning end users' technical skills. In fact, this finding suggested that they were envisioning end users more like themselves or people they knew in regards to technical prowess and using an ill-informed assumption.

The three that were clearly over-confident (Luke, Malcolm and Heather) are the same three participants who provided: (a) evidence of the stereotype confirmation criticism in the task debrief; and (b) two (Malcolm and Luke) suggested non-tenable solutions to Roza's dilemma (see section 10.2.2). This suggests that a lower level of accuracy when combined with a high level of confidence was another associated variable with the criticism of stereotype confirmation.

10.2.4: Clearer focus

Recall that rhetorical theory suggests that a clear audience focus for Designers also leads to the creation of consistent clues in the interface that helps real users adopt the role of the mock user(s) represented by the persona(s). Many proponents argue that personas provide constraints on user populations so that Designers can focus on a specific subset of users (Adlin, et al., 2006; A. Cooper, et al., 2007; Head, 2003; Kuniavsky, 2003; Pruitt & Adlin, 2006). In the next sections, I investigate a means to measure a level of focus clarity based on how participants discussed considerations they made in the design for the personas. First I summarize the question and data analysis procedures (section 10.2.4.1), followed by findings (section 10.2.3.2) and a summary (section 10.2.4.3).

10.2.4.1: Question and data analysis procedures

To provide a further measure of the claim of focus, I asked participants to tell me, "what considerations did you make specifically for Parxat in your design?" If they claimed to have not made any considerations in the design for Parxat, I repeated the question for Shirin. This question was intended to determine a level of focus clarity based on how participants discussed considerations they made in the design for the personas.

Answers were coded for: (1) whether they claimed to have made a consideration (an indication of focus of some sort); (2) how they described the consideration they made; and (3) an analysis of the description in which I judged a level of detail (low, medium and high) the participant used to discuss the consideration. Level of detail was judged because I felt that a high level of specificity explaining how participants made considerations would correlate to a higher clarity of focus about the personas in their design.

Answers in which the participant claimed to have made a user-focused consideration in which they were simply repeating the task was coded for low detail level. For example, a participant who said that they 'created the social interface for the social user' was on one hand focusing on the social user; however, they were not extrapolating detailed information about user needs at a high level of clarity (or at least not able to discuss it). A low level of detail was also coded if the participant claimed to have made a consideration related to some *inaccurate* detail about the personas. A medium level of detail was coded if the participant claimed to have made a consideration related to some *accurate* detail about the personas. And finally, a high level of detail was coded if the participant claimed to have made a consideration related to some *accurate* detail about the personas that was *an invention* of their own; i.e., not at all suggested as part of the task.

10.2.4.2: Findings

In the next sections, I present the findings for each of the participants (sections 10.2.4a-j). The exchange begins after I asked, "what considerations in your design were made specifically for Parxat?"

10.2.4.2a: Leanne. (Medium detail). Leanne claimed to have not made any considerations for Parxat; however, she thought more deeply about Shirin and Roza. In this exchange, she indicated that she made considerations for Shirin to provide quicker access and added social networking features to help Roza 'connect more'.

Leanne	None.
Cynthia	None. And what about Shirin? Do you make any considerations specifically for Shirin?
Leanne	Sure. I guess so. Maybe trying to make.... *(refers to her design)* what I wrote down, like Kyrgyz symbols instead of key words, using, or a quick text menu when using something faster...And then for Roza, I guess I thought of more like social networking features, because she thought the Internet was a threat to local cultures and ways. And so I thought it would be a good way to for her to, like, connect more.

10.2.4.2b: Lucy. (High detail). Lucy made considerations for Parxat. She recognized that Parxat was not as tech savvy as his American counterpart and might need a simple interaction. Additionally, the business control panel was her idea, and not specifically outlined in the task.

Lucy	For him, being the game club owner, I guess that was why I looked at the business, sort of, control panel. I wanted something that would be . . . He's tech savvy compared to most, but it didn't seem like he was . . . Like, compared to, like, an American tech geek, probably not quite so much. ...So, I wanted to make sure that it was fairly intuitive for someone like him...a little.

10.2.4.2c: Lewis. (Low detail). Lewis simply repeated back the task and is non-specific about any considerations.

Lewis	The business directory and how the business directory worked.
Cynthia	Okay. What about for Shirin?
Lewis	The social directory and how the social directory worked.

10.2.4.2d: Luke. (Medium detail). Luke claimed to have (a) made the interaction simpler as a consideration for Parxat and Roza based on (b) an understanding of a lower technical ability.

Luke	Simplicity. **...**I tried to think about it in all of the, like, situations. And each, you know, time he used it, and she used it, and, you know, the housewife be able to use this.
Cynthia	Okay. Would did you do specifically for this one?*(referring to Shirin).*
Luke	Oh. This one? I did this mostly like Twitter. ...So, somebody that always wants to let her family and friends know what's going on, inviting them to certain things, more for an organized way of socializing.

10.2.4.2e: Malcolm. (Low detail). Malcolm was not specific about what considerations he made in his design for Parxat. Additionally, he proceeded to explain his reasoning for the non-specific considerations with details that were not accurate to the personas (i.e. that Parxat was similar to the average Internet user in the US).

Malcolm	Well, there's about fifty of them there. **...**Yeah. I pretty much assumed he was at least nearly as sophisticated as I am as a user. Or as the average Internet user in the US, because he owns a business.

10.2.4.2f: Marco. (Low detail) Marco also implied that he made considerations that simplified the interaction; however, he does not focus on why he made that decision.

Marco	I tried to think a lot about how he could advertise his business in ways that people could find his business easier.
Cynthia	Okay. What about the social user?

Marco	Trying to make it easy for her groups to communicate with her. Kind of remove all of those UI steps just to find something.

10.2.4.2g: Maria. (Medium detail). Maria claimed to have made no considerations for Parxat but had detailed considerations for Shirin based on her needs for different groups. Again, Maria mentioned the audience distance as a hurdle.

Maria	None, because this was like a brainstorming thing. After doing the brainstorming, and rethinking what I have down here, like the use cases, then I wouldn't be thinking in terms of the context of Parxat.
Cynthia	And what about for Shirin? Do you consider her at all? Or would you say the same thing, that you were just not there yet?
Maria	I would kind of be thinking of her, because she seems to be, like, the most tech savvy of this culture. So, I would see her as somebody who would be an admin, and I was considering I didn't write this down. An admin would not only just create this MoSoso directory, but other directories for her, you know, different groups, because tend . . . Well, I don't know about people in this culture, but you may have your family group, and your knitting group, and your college group. So groups for these various circles in your life.

10.2.4.2h: Heather. (Low detail). I coded Heather's discussion as low detail because she uses inaccurate information in that she assumed Roza's church meetings would be part of her everyday life.[84]

Heather	He was the profile that I used for setting up the business.
Cynthia	Okay. What about for Shirin?
Heather	I sort of used a combination for the social networks between Shirin and Roza. ...And just for the groups that I picked, I was using Shirin and then I was going to go back then and add some groups for Roza, too, which would probably be like

[84] There was no information in the personas or context scenarios about Roza's church going behaviors.

family groups and maybe church meetings. You know, something that's more about her daily life.

10.2.4.2i: Hannah. (Low detail). Hannah's explanation of consideration is directly from the task sheet and she does not specify any particular considerations.

Hannah	Well, specific was the setting up the business and the advertising for the business. I mean, that was solely his . . . you know, an area where the requirement came from for that aspect of the design.
Cynthia	Okay. What about Shirin?
Hannah	The social aspect. That was in terms of being able to broadcast messages and, you know, receive messages and new information was uploaded. That was something that was identified in her profile.

10.2.4.2j: Howard. (Low detail). Howard also does not specify any particular considerations.

Howard	Well, he represented the business user. ...So, I used his scenario to design the business portions.

10.2.4.3: Summary

All participants made some user consideration demonstrating that personas have the capacity to facilitate user focus, see Table 49. This is not a surprise; all of the participants had the capacity to differentiate the personas based on their relationship to the product which was the operational definition for focus. However, there was variation in how detailed participants were in their discussion about how and why they conceived design considerations.

Table 49: Summary of focus claim coding

	Did they claim to focus specifically on any of the users?	What they say that they did	What was the level of detail was their discussion?
Leanne	Yes	Social networking features for Roza based on one of her top concerns	Medium detail
Lucy	Yes	Tried to make the interaction easy to use	High detail
Lewis	Yes	*Provided a rote answer based on the task.*	Low detail
Luke	Yes	Tried to make the interaction simple	Medium detail
Malcolm	Yes	Assumed that Parxat was a sophisticated user	Low detail
Marco	Yes	Tried to think about their needs	Low detail
Maria	Yes	Focused on Shirin's circumstances and needs	Medium detail
Heather	Yes	Created business profile for Parxat. Assumed social groups for Shirin and Roza	Low detail
Hannah	Yes	*Provided a rote answer based on the task.*	Low detail
Howard	Yes	*Provided a rote answer based on the task.*	Low detail

Only Lucy justified her design considerations for Parxat with a highly detailed answer that included accurate features about Parxat that also included an invention of her own. Leanne, Luke and Maria (medium detail level) suggested that their user considerations were based on elements contained in the persona and context scenarios; and the elements they selected were actually contained in the personas and context scenarios. Lewis, Hannah, and Howard (low detail) claimed to have made considerations for the personas but then provided no additional detail to justify their considerations beyond what was listed in the task. Finally, Malcolm and Heather (low detail) both claimed to have made consideration for the personas but based their reasoning on inaccurate information.

10.3: Summary: claims and criticisms

This chapter investigated the beneficial claims of personas at a greater depth.[85] This exploration directly addressed the first primary research question of the dissertation: are personas and scenarios perceived as usable, useful and effective

[85] The beneficial claim of context scenarios (they add cultural context) was not directly investigated.

translations/conduits of user research by designers; in other words, do they meet the positive claims made of them in the literature and avoid the criticisms and concerns?

Beneficial claims include a clear focus, increased communication, greater empathy, and avoidance of ill-informed assumptions/stereotypes. In my review, I also found six general categories of concerns and criticisms in the literature about persona creation and use: (1) personas overly abstract the user; (2) personas are not believable due to insufficient research or ties to the underlying research; (3) persona creation requires the specialized skill set of a social scientist; (4) personas may be overused and can become stale; (5) designers need training and/or experience to use personas as envisioned by persona proponents; and (6) they will only be accepted and used if they align to previous stereotypes that designers already maintain. In analyzing worst experiences using personas, I also found a seventh general criticism, that they are created but never used because they were not useful for design.

In the next sections, I first review findings from the direct investigation into the beneficial personas claims explored in this chapter (section 10.3.1). Next, I summarize the findings about the claims and criticisms from Chapters 7 and 8 (section 10.3.2). Lastly, in section 10.3.3, I present summary conclusions regarding personas (and context scenarios) and answer whether personas meet the positive claims made of them in the literature and avoid the criticisms and concerns.

10.3.1 Summary findings from direct investigation

I summarize the findings from the claim investigation via explicit questions (section 10.3.1.1) and the question sets which attempted to implicitly measure the degree to which personas meet their claims (section 10.3.1.2) in the next two sections.

10.3.1.1: Claim investigation via explicit questions

In the analysis of the claim ratings, I asked survey respondents (Designer N = 15) and study participants with multiple persona experiences (Maria and Marco) for the level of agreement to explicit questions about the claims. Designers (N = 17) either

agreed or strongly agreed that personas helped them focus on specific users (94% agreement), helped facilitate communication (82%), and helped Designers empathize with end users (82%). I did not directly ask if personas helped avoid ill-informed assumptions; however, two questions were asked about whether personas have ever been surprising. Almost half (40%) of Designers claimed to have *never* been surprised and 59% felt that personas given to them in the past were *exactly* aligned to their previous conception.

There were also patterns associated with three of the questions:

- Females were significantly less likely to agree to this statement : personas help me communicate better about users to other members of the design and development team.
- Designers with more experience were less likely to agree to this statement : often, I find that personas describe users that are *exactly* like I had imagined even before I was given any user research
- Males, and those with (a) high HCD orientation alignment scores; (b) high scores in the perspective taking dimension of empathy; and (c) self identified problem-driven strategies were less likely to agree to this statement : I have *never* been surprised by the depiction of a user described by a persona.

10.3.1.2: Claim investigation via implicit questions

The question sets investigating claims via implicit questioning were presented in the order they were asked. These questions were only asked of study participants (N = 10). Findings are summarized for each claim (sections 10.3.1.2a-d) below.

10.3.1.2a: Avoidance of ill-informed assumptions and stereotypes. Study participants were asked if they were surprised about what they learned about mobile users in Kyrgyzstan. There were two generalized findings. First, even when Designers claim to have no knowledge of a population (which all of the participants claimed in the preamble), there is an existing framework from which they are drawing (sometimes

ill-informed) assumptions. Second, personas and context scenarios appear to help most Designers avoid some ill-informed assumptions and stereotypes; eight of the ten participants provided evidence that the information contained in the personas/context scenarios helped them reconsider at least one ill-informed assumption.

Specific findings related to a Designer in Seattle, Washington, interacting with personas and context scenarios depicting people in Kyrgyzstan might generalize to a similar distant audience. In sum, most of the surprises were based on assumptions that the Kyrgyzstan people would be less modern and less technical.

10.3.1.2b: Empathy. Study participants were asked to reflect on two scenarios involving the personas: (1) I presented a difficult transportation situation for Roza and asked participants on solutions that might help Roza; (2) I asked participants to reflect on travel preference of the persona characters. Most respondents (six of ten) displayed an intellectual (perspective taking) response to Roza's dilemma. Three participants (Luke, Malcolm and Heather) suggested solutions that were not tenable in Roza's situation. Almost all the participants focused on Shirin's travel (seven of ten); Five of the seven participant's who focused on Shirin cited her young age and student status as reasons for their travel location choice.

Two participants (Malcolm and Luke) gave reasons for their travel answers that were based on an ill-informed assumptions. Recall, that these are two of the three participants who provided: (a) evidence of the stereotype confirmation criticism in the task debrief; and (b) suggested non-tenable solutions to Roza's dilemma. Furthermore, Malcolm was one of the two participants to express no surprise about anything he learned in the previous question (suggesting that he did not believe the information contained in the personas and context scenarios was factual). Combined, this finding suggests the claim of empathy has at least three dependencies.

First, as discussed previously, empathy needs to be constrained by well-informed assumptions or it will lead to stereotype confirmation. Second, the personas must be believable and persuasive documents for empathy with personas to be

possible. Third, Designers must have the capacity to engage with the fiction presented by the personas[86].

10.3.1.2c: Communication (and focus). I asked participants to estimate how much each of the personas used text and the Internet without referring back to the personas, and then asked participants to rate their confidence levels about their responses. All participants (except Lewis) demonstrated an ability to communicate about the personas either by name or by role and clearly differentiated among the user groups suggesting strong support for both the focus and communication claims. Seven of the ten also were able to provide a fairly accurate understanding of the persona text and Internet use, at least in relative terms and were coded as under confident (Howard and Lucy) or accurately confident (Leanne, Maria, Marco and Hannah).

The three participants that appeared to be over-confident of their responses (Luke, Malcolm and Heather based their reasons on ill-informed assumptions) are the same three participants who provided: (a) evidence of the stereotype confirmation criticism in the task debrief; and (b) two (Malcolm and Luke) suggested non-tenable solutions to Roza's dilemma (see section 10.2.2). This suggests that a lower level of accuracy when combined with a high level of confidence was another associated variable (along with low scores in the fantasy dimension of empathy) with the criticism of stereotype confirmation.

When asked about what surprised most participants in the stereotype avoidance claim investigation, most of the surprises were based on assumptions that the Kyrgyzstan people would be less modern and less technical. This finding was incongruous with the fact that among the six participants to provide more than relative

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[86] Recall that Malcolm had the lowest score in the fantasy dimension of empathy which may be related the capacity to engage in the fiction of the personas. Two of the other three low scorers in the fantasy dimension (Heather and Luke) also consistently provided evidence of stereotype confirmation. Malcolm also had the highest score in the empathetic concern dimension of empathy, suggesting that the capacity to emotionally feel connected to others may be less important than the ability to engage with fictional characters when it comes to empathetically engage with personas using well-informed assumptions.

estimation of texting and Internet use, all overestimated texting and five overestimated Internet use. This was an indication that while the participants could focus and communicate about end users, they were still basing their predictions on ill-informed assumptions.

10.3.1.2d: Focus. To provide a further measure of the claim of focus I asked participants to tell me, "what considerations did you make specifically for [persona name] in your design?" All participants made some user consideration demonstrating that personas have the capacity to facilitate user focus. However, there was variation in how detailed participants were in their discussion about how and why they conceived design considerations.

Only Lucy justified her design considerations for Parxat with a highly detailed answer that had accurate features about Parxat and also included an invention of her own. Leanne, Luke and Maria (medium detail level) suggested that their user considerations were based on elements contained in the persona and context scenarios; and the elements they selected were actually contained in the personas and context scenarios. Lewis, Hannah, and Howard (low detail) claimed to have made considerations for the personas but then provided no additional detail to justify their considerations beyond what was listed in the task. Finally, Malcolm and Heather (low detail) both claimed to have made considerations for the personas but based their reasoning on inaccurate information.

10.3.2 Summary findings from study and past experiences

In Chapters 7 and 8, I coded for unsolicited evidence of the claims and criticisms during the preamble and task portions of the study ($N = 10$) and in the responses to past experiences from both the study participants with experiences ($N = 5$) and the survey responders ($N = 32$). I quantified claims and criticisms by counting each instance that was coded in the study and survey discussion about past experience to provide a means to weigh the evidence for each. In the next two sections I present the

summary findings of quantifying weights for claims (section 10.3.2.1) and criticisms (section10.3.2.2).

10.3.2.1: Claim weighting

The summary of claims coded in Chapters 7 and 8 is shown in Table 50[87]. The table demonstrates that clear focus was the most identified claim[88]. Recall that I had coded for clear focus if I had identified evidence in comments or notes that were directed at separating the needs of the users by the persona groups presented in the research materials. In other words, I attempted to ascertain if the participant displayed an understanding of audience needs as defined by the three personas and their context scenarios; both what the needs were and how they were differentiated by user segments.

Table 50: Sum weight of claims (Designers only) Chapters 7 and 8

	Using the Krygyz Personas		First three things	Past experiences						
Claim	Pre-amble	Task De-brief	that come to mind	Last experience - study	Last experience - survey	Percieved success - survey	Best & worst - study	Best & worst survey	**Total**	
Focus	6	9	5	2	2	0	1	6	**26 instances**	**27%**
Communication	3	6	1	0	1	1	1	4	**17 instances**	**18%**
Empathy	2	2	0	1	1	0	0	0	**6 instances**	**6%**
Stereotype avoidance	2	1	0	1	0	0	0	1	**5 instances**	**5%**
Possible	**N = 10**	**N = 10**	**N = 21**	**N = 5**	**N = 16**	**N = 16**	**N = 2**	**N = 16**	**96 possible**	

[87] Each instance represents one study participant or Designer survey respondent answer coded in the portion of the study indicated. As such, the possible score for each cell is indicated by the number of respondents for each. For example, in the "best and worst study participant" category the maximum each cell in the column above could contain is two which would have meant both Maria and Marco's discussion would have been coded for the claim.

[88] This was also the claim that was the easiest to identify which contributed to its highest weighted status.

Communication was the second most identified claim. The communication claim was affirmed in the design study if participants referenced the personas by name in *discussion* or in questions. Communication was also coded if participants discussed the users by roles that aligned to the personas, but did not necessarily use the persona names. Note that it was difficult at times to separate focus from communication; in fact, I discovered that there were no cases of communication without focus[89].

Communication was only coded for six times for five different survey responders. A good example of how communication was discussed by responders was found in Respondent 007's submission about his last experience in which he wrote that the personas:

- "...led to discussion trying to understand why we should believe these personas were better than the last set."

Evidence supporting the empathy claim was only identified in six instances; five of which occurred in the design study preamble and task[90]. Recall that comments in which the participant clearly put him/herself in the user's situation (perspective taking) were coded for the empathy claim. Other empathetic behavior included involvement or questions about the lives of the personas (fantasy), felt compassion or was concerned about the conditions of the persona's situation (empathetic concern), or expressed dismay about the persona's situation(s) as communicated by the scenarios (personal distress). The one instance coded for empathy in the survey responses came from Respondent 079 when she described her last experience in which personas helped:

- "Get a better feel for what they needed on the website, their pain points, etc."

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[89] A case of communication without focus would involve a participant using persona names in conversation but not demonstrating any understanding about how the personas were differentiated. Keywords included use of the persona names (Parxat, Shirin and Roza) and the use of roles, targets or segments in discussion. I did not find any cases of communication without focus.

[90] Note that both focus and communication were easier to identify than empathy and stereotype avoidance which contributed to the weighting.

Finally, the avoidance of ill-informed assumptions and stereotypes was only found in five instances; four of which were coded in the study. I coded for stereotype avoidance if there was evidence of surprise about the Kyrgyzstan people in which a previously held stereotype or assumption appeared to be changed. I only coded for stereotype avoidance for one survey responder when he reflected on his best experience; Respondent 007 wrote:

- "My first experience involving personas was a poster providing three radically different users of our programming software. Because this was a product that we developers used in our daily jobs, we had always assumed we were the target audience. This poster concisely, entertainingly, and memorably confronted that assumption and turned it on its head."

10.3.2.2: Criticism weighting

The summary of criticisms coded in Chapters 7 and 8 is shown in Table 51. Most evidence was found to support two criticisms: (1) unbelievability; and (2) stereotype confirmation.

Recall, that unbelievability was coded for statements that suggested that personas were made-up or not tied to research. I found that this criticism was often related to statements that were also coded for the perception-related independent variable that pertained to research. Both Marco and Maria discussed the importance of the perception of rigorous research as a prerequisite of persona success when discussing their last persona experience. There were five instances coded for unbelievability in the survey responses, for example, Respondent 077 wrote that his worst experience was when he was presented a persona that he described as, "*some bozo one they just made up and it had about as general facts you could imagine.*" In addition to findings in Chapters 7 and 8, Malcolm suggested that he did not believe the Kyrgyz personas which he claimed obviated his ability to be surprised by any of the information contained in the documents.

Table 51: Sum weight of criticisms (Designers only) Chapters 7 and 8

	Using the Krygyz		First	Past experiences						
	Pre-amble	Task De-brief	three things that	Last experience - study	Last experience - survey	Percieved success - survey	Best & worst - study	Best & worst survey	**Total**	
Not believable	0	0	1	2	0	1	0	3	**7 instances**	**7%**
Stereotype confimation	2	3	0	1	0	0	1	0	**7 instances**	**7%**
Designers need training	1	3	0	0	0	0	0	0	**4 instances**	**4%**
Not useful for design / not used	0	0	0	0	0	0	1	3	**4 instances**	**4%**
Overused and stale	0	0	0	0	0	1	0	1	**2 instances**	**2%**
Overly abstract	0	0	0	1	0	1	0	0	**2 instances**	**2%**
Need skills of a social scientist	0	0	0	0	0	1	0	0	**1 instances**	**1%**
Possible	**N = 10**	**N = 10**	**N = 21**	**N = 5**	**N = 16**	**N = 16**	**N = 2**	**N = 16**	**96 possible**	

The criticism of stereotype confirmation was also evident in seven instances, all of which involved the study participants. Recall, that the criticism of stereotype confirmation was affirmed if I found indications that participants were making assumptions that were not supported by data presented in the research materials. In other words, the criticism was considered supported if it appeared as though the participant was treating the personas as empty vessels that the participant used to fill with preconceptions and assumptions they held about the audience.

Marco (the participant with the most persona and context scenario experience) discussed in his best and worst experiences how engineers that he worked with would hijack the persona concept and create their own personas to justify software features. Luke provided evidence of stereotype confirmation in the preamble when in his personal connection to the Shirin persona he applied his knowledge of his age group directly to her; knowledge that was not in the information presented by the personas. Three participants (Luke, Malcolm and Heather) fabricated persona activities (that were not part of the personas or context scenarios) as part of their justification for their design.

I also coded for the criticism that Designers need training to use the personas in the four instances in which stereotype confirmation was observed. This was because all of the participants who demonstrated stereotype confirmation had never used personas.

There were also four instances of a seventh criticism that was not evident in the literature. Maria and three survey respondents discussed how personas were created but then not used because the personas did not contain content that was useful for design.

There were two instances of the overused and stale criticism. Recall, that any reference to a past experience in which the participant or respondent refers to personas being used over multiple projects and thereby losing their effectiveness was coded for the criticisms describing personas as becoming overused and stale. For example, Respondent 070 wrote that in her worst experience:

- "The app was so large that they had developed these sort of "over arching" personas that they expected to be repurposed throughout the app...the app was also old so that most of user research (sic) was not able to provide much guidance."

The over-abstraction criticism was also coded in two instances. Recall, that overly abstracting the user criticism was coded if participants or respondents inferred that personas were too broadly defined to help or if participants/respondents explicitly expressed mistrust of the methods due to over abstraction. Lucy provided evidence for the over abstraction criticism when she suggested that the Kyrgyz personas did not match her perception of personas suggesting that they were "*fake people*" based on "*interviews with people of a certain type*" and that for her this was "*less personal.*"

Finally, I coded for the criticism that personas require the specialized skills of a social scientist in one instance. Respondent 019 addresses the importance of the background and education of the research team when he wrote:

- "Effectiveness was closely related to the experience of the person (researcher I guess) that produced the persona. They are not easy to create..."

10.3.3: Claims and criticisms conclusions

One general finding from the investigation into persona beneficial claims was they are interdependent, see Figure 109. Focus, or the ability to identify and differentiate user needs was essential for all the other beneficial claims to be met. In other words, the focus claim was the platform on which all other claims could be achieved and avoid the stereotype confirmation criticism. Additionally, if empathy was not channeled through well-informed assumptions then it would lead to stereotype confirmation.

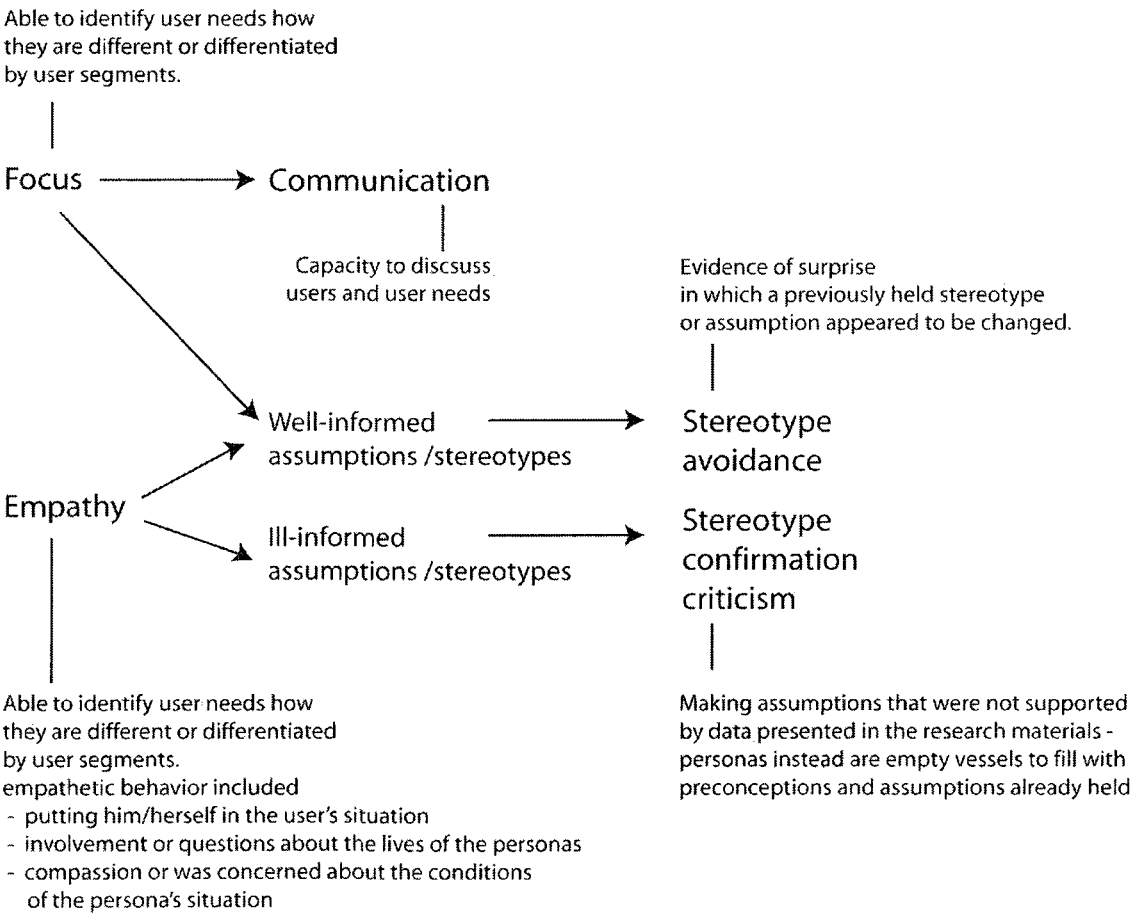


Figure 109: Claim interdependencies

I did not directly investigate context scenarios claims (that they add cultural context) because I had only Marco as an informant. Each persona claim was

investigated three ways: (1) I coded for unsolicited mention in the discussion of past experience by applying an operational definition and then totaled the number of unsolicited mentions to achieve a weighted claim comparison; (2) I explicitly asked agreement to the focus, communication and empathy claims, and in the case of stereotype avoidance, I asked two questions which were intended to measure the level of surprise which I associated with the avoidance of ill-informed assumptions; and (3) I inferred claim evidence through questioning that was intended to use implicit means to investigate the claims with study participants.

The claim of clear focus was the most supported among the four claims in each type of investigation. There were 26 instances of focus coded in past experience discussion and observed in the study representing 27% of all possible instances in which it could have been coded. Most (94%) Designers with past persona experience explicitly agreed with the claim. When asked directly what considerations participants made for the personas, all indicated some user consideration.

While this study did not directly investigate whether communication led to better decision making, I found that personas often had the capacity to facilitate communication about users represented by the personas. There were 17 instances of communication coded in the past experience discussion and observed in the study representing 18% of all possible instances in which it could have been coded. A total of 82% of Designers with past persona experience explicitly agreed with the claim. When asked to recall specific facts about the personas, all participants, except Lewis, demonstrated an ability to communicate about the personas either by name or by role and clearly differentiate among the user groups

There was less evidence to support the claim of empathy. There were six instances of empathy coded in past experience discussion and observed in the study representing 6% of all possible instances in which it could be coded. Most (82%) Designers with past persona experience explicitly agreed with the claim of empathy. When asked about scenarios involving the personas, at least seven of the ten

participants were able to infer a solution (for Roza) or an answer (about travel) that was tenable based on the information available in the personas and context scenarios.

Avoidance of ill-informed assumptions and stereotypes was the least supported claim. There were five instances of stereotype avoidance coded in the past experience discussion and observed in the study representing 5% of all possible instances in which it could be coded. There was no direct question asked; however, 40% of Designers claimed to have *never* been surprised by a personas' content in past use and 59% reported that the personas they were given had aligned *exactly* to their previous conception about end users. When asked if anything about the Kyrgyz personas was surprising, eight of the ten participants said yes, which indicated that most reconsidered at least one ill-informed assumption they had before the study.

Criticisms were not as thoroughly investigated; I only coded for instances in the study and in respondent and participant discussion of past experience by applying an operational definition and then totaled the number of instances for a means to weight criticism evidence. The most prevalent criticisms were (1) unbelievability and (2) stereotype confirmation.

There were seven instances of the unbelievability claim representing 7% of all possible instances in which it could have been coded. The unbelievability claim is also directly related to the perception-related variable of the importance of research and research transparency which I found to be the most important and salient perception-related variable in Chapter nine.

There were also seven instances of the stereotype confirmation criticism representing 7% of all possible instances in which it could have been coded. There was more support, therefore, of the stereotype confirmation criticism than there was of the stereotype avoidance claim when investigating participants in the preamble and task portion of the study and in respondent and participant discussion of past experience.

10.4: Next steps

In the next and final chapter, I summarize all of the findings and discuss how the results helped answer the research questions driving this investigation. I also provide a list of recommendations for UX researchers to maximize the beneficial claims of personas (and context scenarios) and to minimize occurrence of the criticisms. This includes understanding what matters to Designers (perceptions) and what designer-related independent variables are associated with persona (with context scenarios) success and failure.

Chapter 11: Discussion and key findings

"Interesting reaction....but what does it mean?"

Jack Skellington (Selick, Burton, McDowell, & Thompson, 1993).

In this investigation, I was concerned with disambiguating the utility of personas (and context scenarios) to help better communication between UX research and design in HCD practice, which will ultimately lead to better end-user experiences. Recall, that the primary research questions for this dissertation concerned the UX Researcher – Designer relationship and asked: (1) are personas and scenarios perceived as usable, useful and effective translations/conduits of user research by designers; in other words, do they meet the positive claims made of them in the literature and avoid the criticisms and concerns? And (2) what should UX researchers strive to understand about designers to maximize designer understanding of end user goals and needs; in other words, can personas and scenarios be made more useful and usable?

These questions were studied in part by using personas and context scenarios describing mobile users in Kyrgyzstan who represented a single case of a geographical and culturally 'distant audience'. This explored the secondary research question which concerned the UX Researcher-User relationship; i.e., as the audience for technical products expands geographically and towards greater inclusion what are some method modifications UX researchers may need to consider for researching these new audiences, specifically for creating personas and context scenarios? I chose to focus on a distant audience for two primary reasons: (1) if design teams will increasingly have less innate understanding of users as the audience for technology products/services expands, then it is not only increasingly important for UX researchers to successfully communicate the end user message (e.g. the mock user), but also to develop methods and procedures to effectively investigate distant audiences; and (2) by reducing designer familiarity with end users, a distant audience accentuates whether personas

and context scenarios can meet their claims as effective mock users. This is because in the void of extensive existing knowledge about end users, designers will only have UX research to guide their understanding.

In the next three sections, I address the research questions. In section 11.1 I summarize and discuss whether personas (and context scenarios) are effective and successful at helping Designers create mock users. In section 11.2, I summarize and discuss what UX Researchers should strive to understand about their Designer audience to maximize effectiveness. In section 11.3, I address the secondary research question of the dissertation and summarize the case study in which I created personas and context scenarios representing mobile users in Kyrgyzstan using data collected for other purposes (presented in Appendix A). In section 11.4, I present ideas for future investigations. And finally, in section 11.5 I summarize the major contributions of this investigation.

11.1: Are personas effective mock users?

Are personas (and context scenarios) perceived as usable, useful and effective translations/conduits of user research by designers; in other words, do they meet the positive claims made of them in the literature and avoid the criticisms and concerns? Yes, sometimes. This was studied in depth in chapters 7 through 10. The next sections summarize major findings about what personas did well (section 11.1.1), what context scenarios added to persona utility (section 11.1.2) and in what areas personas did not perform as well (section 11.1.3).

11.1.1: What personas did well.

Personas were rated as effective or very effective by 63% of the survey responders with Designer job titles the last time they used personas (see Chapter 8). I found that for most Designers in the design study (9 of 10) personas (with context scenarios) had the ability to facilitate the creation of mock users which were aligned to users based in the UX Research (see Chapter 7 and 10). The beneficial claim of clearer

focus, therefore, was well supported; focus was also evident in many reported past experiences (see Chapters 7, 9 and 10). Additionally, for most designers in the study (8 of 10), personas had the capacity to aid communication about end users; however, effective communication was somewhat dependent on the designer having a clear focus on a research-based user (see Chapters 7 and 10).

11.1.2: What did context scenarios add.

Proponents of context scenarios suggest that stories add cultural context. While none of the study participants explicitly mentioned this aspect, the context scenarios were deemed more helpful (when compared to the personas) to the design task by four of the ten participants (see Chapter 7). (Conversely the personas were considered more helpful by two of the ten participants). Additionally, Marco suggested that context scenarios helped him focus on users and avoid ill-informed assumptions when he discussed the 'first three things' that came to mind about scenarios (see Chapter 8).

11.1.2: What personas did not do as well?

There was much less evidence supporting personas as purveyors of greater empathy for end users; however, it was a difficult claim to identify. A demonstration of greater empathy is partly reliant on designer capacity for empathy; the dimensions which are discussed in the next section in the answer to the second research question (what should UX researcher strive to understand about Designers to maximize persona utility). Additionally, I found that empathy for end users needed to be constrained by well-informed assumptions to avoid stereotype confirmation (see Chapters 7 and 10); however, personas did not consistently help Designers avoid ill-informed assumptions. There was actually more evidence in Designer discussion about past experiences that supported stereotype confirmation than stereotype avoidance.

The evidence regarding the avoidance of ill-informed assumptions is mixed. Among the survey responders, 60% of Designers claimed that they had *never* been surprised by a depiction of a user described by a persona and 41% felt that personas had described users *exactly* like the users they had imagined (see Chapter 10). This

indicated that somewhere between 40-60% of Designers were likely applying previous assumptions to the personas (however, we do not know if previous assumptions were actually ill-informed). This finding suggested that personas were poor at helping designers avoid ill-informed assumptions.

However, when study participants were asked about what surprised them about the Kyrgyzstan personas (and context scenarios), there were two findings that added nuance to the avoidance of ill-informed assumption claim (see Chapter 10). First, even when Designers claim to have no knowledge of a population, there is an existing framework from which they are drawing (sometimes ill-informed) assumptions. While this statement seems obvious, it is an important aspect of communicating about a distant audience that UX Researchers need to consider; i.e., no one is a blank slate even when previous knowledge is limited.

Second, when interacting with personas that represented mobile users in Kyrgyzstan, eight of the ten participants provided evidence that the information contained in the personas/context scenarios helped them reconsider at least one ill-informed assumption (see Chapter 10). Whether any of the assumptions were critical to the actual design is debatable. However, displaying the capacity for surprise does suggest that the personas provided new information; information that may not have aligned to a previous assumption. This may also be related to the fact that the study participants had very little previous knowledge about Kyrgyzstan so their initial assumptions were more easily replaced. In other words, if this had been an audience in which they held many (strong) beliefs, the personas may have been less effective at (1) enticing surprise and (2) at convincing the participants that their previous assumptions were ill-conceived.

Finally, the criticism of unbelievability was fairly well supported. This result suggested that many Designers found the perception of rigorous research methods and transparency to be salient concerns (see Chapters 7, 8 and 10). Furthermore, this is evidence that perceptions about the creation of the personas can be an influential

variable to Designers finding personas as effective summarizations of research. I discuss salient Designer concerns in more depth in the next section.

11.2: Mock Designers

What should UX researchers strive to understand about Designers to maximize Designers' understanding of end user goals and needs; in other words, can personas and scenarios be made more useful and usable? There are two aspects to answering this second primary research question: First, what is important to designers to help make personas more persuasive (section 11.2.1) and second, what designer-related variables appear to be associated with successful persona use (section 11.2.2)?

11.2.1: What was important to Designers?

This section reviews what Designers found as salient to persona/context scenario believability and effectiveness. The sub sections are split into perception-related variables (section 11.2.1.11) and exogenous variables (section 11.2.1.2).

11.2.1.1: Perception-related variables

Perception-related variables were investigated in depth in Chapter 9. Based on weighting the unsolicited mention of the perception-related variables (research methods/transparency, presentation, sampling and sample size, and research team), I found that research methods and transparency were the most salient perception-related variables (section 11.2.1a) followed by the presentation of the personas (display, content, quality and how the personas are communicated, section 11.2.1b). Both the sampling/sample size (section 11.2.1c) and research team (composition and transparency, section 11.2.1d) concerns did not appear to be as critical of factors to Designers when considering personas and scenarios. Additionally, the impact of using personas (and context scenarios) that represented a distant audience was investigated (section 11.2.1e).

11.2.1.1a: Research methods and transparency. When survey responders were asked directly about research transparency, it was considered 'very important' or

'important' by most (69%) of Designers. Designers that found transparency important suggested it was important to increase believability in a follow-up open ended response.

When both study participants and survey responders were asked directly about methods, qualitative methods were mentioned often and considered more appropriate methods to create personas and scenarios. The most common method mentioned by all study participants and survey responders was interviews (35% of the combined Designer sample), followed by contextual inquiry or a concern that observational methods were used in the context of use (27% of the combined Designer sample). Surveys and focus groups were also commonly mentioned methods.

Combined, these findings suggest that Designers generally want to know about the research and that they were not impressed with quantitative methods. In fact, the term 'statistical significance' was either meaningless or had a negative connotation implying impersonal number crunching for four of the ten study participants. Recall, that Chapman and Milham (2006) suggested that personas should be created using large sample sizes and multivariate statistics; findings from this study suggest that this is not important to Designers to find personas persuasive.

11.2.1.1b: Presentation. When asked directly about presentation modes there were three areas of concern among the Designer groups. I categorized findings into three main areas of concern: (1) display; (2) content; and (3) communication.

- *Display.* Posters, PowerPoint slides and fact sheets were the most recommended formats. When presented with hypothetical alternate formats, most of the study participants were not encouraging (the only exception was for a visual storyboard layout (versus text) for the context scenarios); additionally, alternate formats were rarely mentioned by survey responders.
- *Content.* When asked to reflect on what content was useful in their last experience, designer survey respondents reported that they found

personas were more useful when they included: (1) product/ service related information; (2) general technical information; and (3) demographics. Personas were less useful when they included: (1) non-product/service related information; and (2) demographics and fact sheets. The fact that demographics are in both categories indicates that some Designers have found them important in some cases while others found demographics extraneous.

A common consideration for content was to include a means to provide a more direct comparison of data points. Additionally, study participants had content comments when considering a distant audience. Maria specifically suggested that the documents needed more contexts and Lucy wanted more information about phones using the Cyrillic alphabet.

- *Communication.* Several study participants and survey respondents focused on a need for formal presentations or meetings to communicate the personas/scenarios. A formal presentation was also associated with a high degree of organizational support.

11.2.1.1c: Sampling/sample size. Among the Designers who did identify a specific sample size, the most common range was more than five but less than fifteen. Sample size was dependent on the size and/or variability of the end user audience.

11.2.1.1d: Research team composition and transparency. When asked directly about research teams, most (seven of ten) of the study participants claimed to care about the composition of the research group. Salient qualities of the research group included education, level of experience, profession, and the size of the research group (i.e. at least two people for inter-rater reliability). Among survey responders, 60% rated research group transparency as either 'important' or 'very important'. Reasons given for the importance of transparency focused on issues of believability and credibility.

11.2.1.1e: Distant audience. Eight of the ten study participants mentioned some salient factor about audience distance in either the preamble, task, or debrief portion of the study. There were three major findings when asked to rate the relative effectiveness of personas when representing a familiar audience versus an unfamiliar audience (office workers in Seattle compared to (a) people in Kyrgyzstan and (b) teens with autism).

First, the unfamiliarity of the audience was a salient concern and second, the two types of distance (geographical versus psychological) were not rated evenly. When considering the autism versus office worker audiences, 81% of Designers (combined group of study participants and survey responders $N = 18$) perceived a difference of effectiveness for personas/scenarios. When considering the Kyrgyz/Seattle comparison ($N = 20$), 70% perceived a difference of effectiveness. Third, more distance was perceived for the autism audience; i.e., the psychological distance was seen as a larger gap than the geographical and cultural distance. Of those that found differences, most (64%) found the personas (and context scenarios) representing a distant audience as *more* effective.

11.2.1.2: Exogenous variables.

There were three exogenous variables explored in the discussion of past persona experiences: (1) organizational support (section 11.2.1.2a); (2) timeline and budgets (section 11.2.1.2b).

11.2.1.2a: Organizational support. A high level of organizational support appears to be very important to the perceived success of personas by Designers. This conclusion is supported by: (1) the high level of association between the ratings of persona effectiveness and organizational support in the last experience (see Chapter 8); (2) lack of organizational support was cited by two survey respondents and one study participant (Lucy) for why personas were ineffective (see Chapters 7 and 8); and (3) high organizational support was discussed by Marco and Maria as part of their best experiences (see Chapter 8).

11.2.1.2b: Timelines and budgets. Timelines and budgets were mentioned by two study participants (Lucy and Maria) as partial explanation for why personas were not successful in the past (see Chapter 8).

11.2.2: What should UX researchers know about their specific audience?

What should UX researchers know about their design team to maximize persona (and context scenario) use? This summary section is meant to act as a quick reference to the major findings regarding what UX researchers should know about design teams and is split into two parts (1) perception-related (section 11.2.2.1) and (2) designer-related (section 11.2.2.2).

11.2.2.1: Perception-related

- It is important to communicate about the research methods, but it is generally better to emphasize qualitative work. Designers are generally not impressed by quantitative methods or terms like 'statistical significance' (see Chapter 9).
- Presentation was an important consideration. It was suggested by several informants to use multiple forms of presentation if possible; however, gimmicky presentations were not well received. Informants suggested that posters and fact sheets work well and personas should be revealed in a formal presentation. Additionally, presenting context scenarios as visual storyboards was an idea that was well received (see Chapter 9).
- When dealing with representing distant audiences, add more context to the presentation (see Chapter 7 and 9).
- Sampling/sample size was not very important to most Designers; however, more inexperienced Designers were more willing to venture a guess at an appropriate sample size indicating that it may be a more important consideration for inexperienced Designers (see Chapter 9).

- Knowing the composition of the research team was somewhat important. Believability and credibility were associated with the education, level of experience, profession, and the size of the research group (i.e. at least two people for inter-rater reliability) (see Chapter 9).
- A high level of organizational support was a very important factor contributing to persona success indicating a need for high level buy-in for an effective persona (and context scenario) effort (see Chapter 8).

11.2.2.2: Designer-related

The most important attributes to know about the design team when considering using personas and context scenarios to communicate UX findings were (a) professional experience (section 11.2.2.a); (b) self-identified cognition strategy (section 11.2.2.b); (c) experience using personas (section 11.2.2.c); (d) HCD orientation alignment (section 11.2.2.d); and (e) empathetic profile (section 11.2.2.e).

11.2.2.2a: Professional experience. Professional experience is important to know because:

- Higher level of professional experience was associated with finding the context scenarios as more helpful documents; less experienced Designers had more difficulty engaging with a textual presentation of scenarios (see Chapter 7).
- Less experienced Designers were more likely to agree to the statement "Often, I find that personas describe users that are *exactly* like I had imagined even before I was given any user research." (See Chapter 10). This finding suggests that Designers with less experience may be more susceptible to the stereotype confirmation criticism because this is evidence that inexperienced Designers have a reduced capacity for surprise.
- Experienced Designers overwhelmingly considered themselves (a) problem-driven in their design strategies and (b) were more likely to have domain expertise (see Chapter 6). Experience, problem-driven strategy and domain expertise were all associated with an ability to engage with the personas and

context scenarios at a deeper level when the documents were introduced. A deeper initial engagement led to more time spent on the task in the solution-focused space.

11.2.2.2b: Cognition strategy. The self-identified cognition strategy for participants and survey responders was presented in Chapter 6. For improving the UX researcher – designer dialogue, cognition strategy is important to know because:

- Solution-driven strategists had less inclination to engage with the personas and context scenarios when the documents were introduced in the design study. Solution-driven strategists also found:
    - The presentation of the documents was more salient, indicating, that this is a very important area of focus if dealing with a solution-driven group (see Chapter 9).
    - Personas/scenarios describing teens with autism were considered less effective than those representing office workers in Seattle. This suggests that the solution-driven group may be pre-disposed to pay less attention to UX research when it describes an unfamiliar audience (see Chapters 9).
    - They were unlikely to have ever been surprised by a persona. This pattern suggests that Designers who identify as solution-driven may be more susceptible to the stereotype confirmation criticism because this is evidence that inexperienced solution-driven strategists have a reduced capacity for surprise (see Chapters 10).

11.2.2.2c: Experience using personas. More experience using personas in more projects was associated with finding personas (and context scenarios) representing Kyrgyz mobile users as more effective than those representing Seattle office workers (see Chapter 9). This suggests that more experienced Designers with the method may feel that they are going to get more effective information when dealing with an unfamiliar audience.

1.2.2.2d: HCD orientation alignment. HCD orientation alignment; i.e., alignment to the Gould and Lewis principles, was established in the screening survey (see Chapter 4). HCD orientation alignment scores were associated with other findings:

- The two highest scorers in the study never mentioned or focused on distant audience issues (see Chapter 7). This suggests that distant audience issues may be less salient to those with a high HCD alignment.
- All informants who independently discussed organizational support had low HCD orientation alignment scores (two or lower) (see Chapter 7). This finding suggests that a greater alignment to HCD principles may help negate the importance of organizational support.
- Survey responders who agreed that they had *never* been surprised by a persona had lower scores than those who disagreed (see Chapter 10). This suggests that greater alignment to the Gould and Lewis principles was associated with the ability to have been surprised by a persona depiction and therefore may be less susceptible to the stereotype confirmation criticism.

1.2.2.2e: Empathy dimensions. Descriptions and findings about the empathy dimension scores for survey responders and design study participants were presented in Chapters 6 and 7. There were three associations of note with the empathy dimensions in relationship to the criticism of stereotype confirmation:

- Those that scored higher in the perspective taking (PT) dimension were more likely to disagree with the statement that they had *never* been surprised by a persona (see Chapter 10); this finding suggests that higher PT scores may be associated with a lower level of susceptibility to the stereotype confirmation criticism.
- A high score in the empathetic concern (EC) dimension appears to be associated with evidence supporting the empathetic claim of personas (see Chapter 7 and 10); recall that I also found that empathy needed to be

constrained by well-informed assumptions to not lead to stereotype confirmation. This finding suggests that those Designers with high scores in empathetic concern may be at higher risk for stereotype confirmation.

- Low scores in the fantasy dimension (combined with inexperience using personas) were associated with evidence of stereotype confirmation (see Chapters 7 and 10). This finding suggests that the capacity to engage in fictional characters is an important consideration to avoid stereotype confirmation. Additionally, Designers with low fantasy scores and high empathetic concern scores (i.e. Malcolm) may be at the greatest risk for stereotype confirmation.

In this section, I answered the second primary research question in which I discussed salient Designer concerns that are important to consider to maximize persona (and context scenario) utility. In the next section, I summarize findings presented in Appendix A in regards to the secondary research question which asked: What are some method modifications UX researchers may need to consider for researching these new audiences, specifically for creating personas and context scenarios?

11.3: Distant audience personas: case study

As the audience for technical products expands geographically and towards greater inclusion, what are some method modifications UX researchers may need to consider for researching these new audiences, specifically for creating personas and context scenarios? In the case study explored here of mobile users in Kyrgyzstan, I had limited access to the users requiring a reuse of data that was collected for other purposes. I reported the resulting method modifications in depth in Appendix A

The creation of personas and scenarios commonly uses face-to-face interviews and observation studies to examine current and possible future uses of a specific product or service (Cooper et al., 2007). When designing products for the developing world or other diverse communities, however, these common research methods are not always viable for many reasons: Budgets are limited, the ability to perform firsthand

onsite research can be challenging without extensive local knowledge and product cycle time frames can limit the feasibility of field research. Each of these factors might prevent the in-depth study of a target market that would be typical for traditional approaches to persona and scenario creation. In sum, access to users is limited.

Unfortunately, there are very few examples in the literature that discuss complications when creating personas/scenarios that do not assume this perspective of access to end-users. One solution to these challenges is to use data that are otherwise available. Many countries, market research firms, and academics conduct social survey work and ethnographies. Global projects, such as the World Values Survey or the World Internet Project, provide overviews of populations, their attitudes, and patterns of media and technology usage. Anthropologists produce ethnographies about societies around the world, and sociologists conduct in-depth studies that designers could repurpose if they had a methodology to do so. However, using data that are otherwise available introduces additional challenges which are summarized in the next section.

11.3.1: Summary procedures: a model for using existing data

I had two data sources from research that was conducted as part of the Central Asia + Information and Communication Technology project (CAICT), a multiyear study of the use of information and technologies in Central Asia. The first set of data was from an April–May 2007 large-scale social survey of 1,000 respondents, aged 15 and older, that was administered in urban and rural areas in several regions in Kyrgyzstan. The survey sample was based on government census information on age, gender, ethnicity, and geographic location.

The second set of data used to inform the personas and scenarios was from focus groups and interviews conducted by three University of Washington researchers in two Kyrgyzstan sites: the capital city of Bishkek and Kara Balta, a smaller suburban city. Researchers conducted two sessions in each location; each session involved a focus group and individual interview of three individuals, for a total of 12 adult

participants. This data identified mobile phone usage patterns that inform the maintenance of social networks.

When using existing data sources, segmenting participants/responders is required. Typical persona segmentation starts with motivations, behavior or attitudes in relationship to a product or service; therefore, the first challenge in using existing data sources is to find a segmentation model that is appropriate. In the case of the Kyrgyzstan data, I started by segmenting the audience by their motivation to acquire a mobile phone. That segmentation then became a lens by which to analyze other constructs: (a) demographics, (b) attitudes about mobile phones and mobile phone usage, and (c) other technology experience. Once the groups were defined, I turned to the qualitative interviews for personal profiles and scenarios.

Each interview participant was placed in a segment based on his/her presumed motivation to acquire a phone, and his/her interview information was used to fill in biographical stories. The resulting persona information was amalgamated into a single sheet for each persona. The context scenarios presented in Appendix A (and to study participants) were based on real-life stories in response to interview questions about difficulties the participants had encountered. For each context scenario, I inferred how the to-be-designed service could help the participants navigate those difficulties.

11.3.2: Conclusions

This is just one example of how UX researchers might modify procedures for creating personas and context scenarios representing distant audiences. The model presented here would not necessarily generalize to other distant audience situations, for example, teens with autism; however, it might generalize to cases where some data about the population exists and there is limited access to end users.

Designing for diverse populations is crucial for both development and economic reasons. However, design research for diverse populations, including those in developing regions, is expensive requiring significant resources and expertise. Therefore, using existing data sources can reduce costs while still representing the user

needs of these populations. Whereas on-the-ground studies are irreplaceable as data sources, other approaches are needed if design is to address increasingly diverse users. User researchers and designers can make significant headway toward creating appropriate designs by extracting user requirements from existing data sources.

11.4: Implications for future work

I believe that this dissertation provides evidence that as a communication tool, personas (with context scenarios) are hammers. In other words, if your nail is clearer focus (and to a lesser degree communication), then personas are effective tools. However, improvement of the tools so they can consistently meet the more elusive claims of greater empathy and avoidance of ill-informed assumptions/stereotypes will require some tweaking of the persona (with context scenario) method. Tweaking the methods should also address (a) the unwanted outcome of stereotype confirmation in which Designers treat the personas as empty vessels to fill with their own assumptions and (b) the concern that personas are not believable due to insufficient ties to data.

So, I believe that future research about personas (used with context scenarios) should concentrate on how to move personas from a limited tool (i.e. hammer) to one that can deliver on more of the promise indicated by beneficial claims made in the literature (i.e. Leatherman). There are two general ideas that have emerged in my reading and thinking: (1) co-creation (section 11.4.1); and (2) increase the levels of access and interaction with the underlying data (section 11.4.2). Both of these ideas also address the primary criticism of non-believability. Each is discussed in the next sections followed by a discussion about study weaknesses which have implications for future work (section 11.4.3).

11.4.1: Co-creation

There is advice and debate about who should be responsible for data collection and analysis of user research in the popular literature. Cooper et.al (2007) advocate training designers to do their own research. The authors feel that current UX research

and designer roles are currently over specialized, missing a "systematic means of translating and synthesizing research into design solutions," that they feel could be solved by designers doing their own research. Cooper is not alone, there are many proponents of 'designers as user researchers' model (Krippendorff, 2007; Laurel, 2003). I do not entirely agree with this perspective.

Many researchers have reported that it is awkward or impossible for Designers to incorporate user data from researchers in their work (Melican, 2000). As an industrial designer with many years of design experience, I too have been frustrated with trying to integrate UX research in my design process. However, after spending the last five years learning how to become a researcher, I feel Cooper et. al.'s argument underestimate the skills one acquires formally learning how to do research. The central concept of this first proposal of 'co-creation' is that the researcher is responsible for data collection; but interpretation and amalgamation are done by both a team of researchers and designers. (I understand that this may be unrealistic in all cases). I believe that co-creation will maintain the ability for personas (and context scenarios) to provide focused mock users and facilitate discussion but also address the avoidance of ill-informed assumptions.

Avoidance of ill-informed assumptions/stereotypes requires Designers to learn new facts and change concepts that may be inconsistent with their existing knowledge. Helping learners through conceptual change is a long standing concern in pedagogy. Theories on conceptual change generally agree that: (a) people build their knowledge base and learn through their daily experiences; (b) this knowledge base (i.e. naive knowledge) has the capacity to influence formal learning; and (c) naive knowledge can be resistant to change (Özdemir & Clark, 2007). Constructivist theories view a learner's existing ideas as a primary source for learning.

Constructivist epistemology informed the theoretical frameworks posited by Vygotsky. Vygotsky argued that looking at where a learner is now; i.e., tasks he could perform independently, is measuring "yesterdays" achievements (Vygotsky, 1978). He

proposed a "Zone of Proximinal Development" (ZPD), which is the gap between where: (1) the learner is currently capable of independently performing a task; and (2) what the learner can do through imitation and guidance. In the co-creation concept, I am proposing that researchers scaffold the learning about end users for Designers by working within Designers' ZDP.

In other words, UX researchers should first help Designers uncover assumptions. I have found in this investigation even when Designers purport to know nothing about an end user audience, most still have the capacity to be surprised which meant that they had some pre-existing framework. So the first step in co-creation is to surface assumptions to understand the Designer's ZDP relative to the end user audience.

The next step of the co-creation model would be a generative process in which UX researchers would provide initial segmentation (the focused mock user buckets) but allow Designers to help 'flesh-out' persona details by accessing raw (or somewhat raw) data. This idea is not new as other researchers have suggested that it is important for Designers to "immerse themselves in the user's world" (Hanington, 2003). I believe that this would allow Designers to construct their knowledge about end users in a way that fits into their existing framework of knowledge. It would also force discussion about assumptions and provide a more memorable engagement with user research. Additionally, UX researchers would not be in the position of determining what user details were important to include; instead, Designers would include the information they felt was important.

11.4.2: Multi-level access and increased interaction

If co-creation is not possible, my second proposal to maximize persona and context scenarios use is to increase the levels of access and interaction with the underlying data. Melican (2000) observed in his doctorate dissertation that the designers he studied preferred raw user data over summarizations; summarizations often did not contain the information the designers were seeking. It is hard for UX

researchers to predict what Designers will need and difficult for Designers to forecast everything they will need in the design process. The concept of multi-level access and increased interaction addresses these concerns.

The multi-level concept is to provide the user information at many levels of detail while maintaining what personas (and context scenarios) do well; i.e., facilitate focus and communication. For example, imagine a web site in which each persona is presented on the front page with the top three top things to know; this would facilitate a quick focused mock-user image. If the Designer needed to know more about the personas or there was a conflict of understanding of the persona's abilities, there would be drill down pages exploring multiple facets about the persona, for example, technical abilities.

The increased interaction concept allows for Designers to question the persona directly and add to their knowledge about the personas within their own mental framework. It is an idea that borrows from participatory design in which the end user has an active voice at the design table (Törpel, 2005). For example, imagine that a Designer cannot find what s/he needs in the drill down set of data and would like to 'talk' directly to users represented by the personas to resolve an issue. It would be ideal if the Designer could simply email the persona and ask the question of the persona directly. This communication could be facilitated by the research team who owned the personas or by having direct access to users that share the important persona qualities pertaining to the Designer question. In this way, the persona remain less abstracted and a less likely target for stereotype confirmation.

However, not all 'live' information would need answering by persona owners. I also propose that the personas be entered into a data base as something similar to a style sheet with multiple properties in which a search engine could parse the data. For example, if a Designer needed to know font size preferences of a targeted persona, they could search directly for that attribute allowing a search engine to parse the data. Designers, therefore, could also access the user data in ways that made sense to them.

Additionally, the 'live' persona concept also frees UX researchers from having to predict what information the Designer is going to need.

11.4.3: Study weaknesses and implications for future work

In these sections, I reflect on the larger method weaknesses of the study (section 11.4.3.1) and missed opportunities (section 11.4.3.2). By way of concluding this section, I reflect on the structure of the study and implications for future similar investigations about personas and context scenario utility (section 11.4.3.3).

11.4.3.1: Method weaknesses

There were two fundamental method weaknesses. First, the sample was not random. This is a constant problem with surveys as it limits the ability to generalize the findings. Second, there was no inter-rater reliability for the coding of unsolicited mention of claims, criticisms, perception-related variables or exogenous variables in the open ended survey responses and participant discussion; this was due to time and budget constraints. (I was able to get inter-rater reliability for the open-ended screening survey questions).

11.4.3.2: Missed opportunities

In retrospect, it would have been helpful to know how much experience the design study participants had with texting and what types of phones participants were familiar. This would have at some level gauged a measure of technical expertise with the task.

Not all the study participants had experience using personas and therefore did not understand that the personas represented many users. In retrospect, it would have been valuable to understand how many users they thought that the personas represented. Additionally, a line of questioning directed at novice users to probe first time use might have produced valuable insights for designing UX research documents for Designers with little or no personas/context scenario experience.

I also believe that it would have been valuable to have asked *why* participants were surprised with information related to the Kyrgyzstan personas; this would have at some level helped to have determined their existing frameworks. (I only asked *what* they were surprised about).

The study would have also benefited from a direct line of questioning about how the personas and context scenarios specifically helped a participant's design in the study. This would have provided more information about what content is valued and each type of document's relative utility.

11.4.3.3: Study structure and implications for future work

First, the truncated time in which participants interacted with the personas and context scenarios was somewhat artificial in that it did not duplicate real world conditions. A future study might consider observing persona and context scenario use over a longer period of time with experienced Designers. Examples in the literature, (Blomquist & Arvola, 2002; Rönkkö, 2005) focus on novice designers or designers with no familiarity using personas.

In retrospect, the task was too complicated; the idea of a text-based interface was a very difficult concept for the participants to understand (i.e. object familiarity). Only Howard really understood the task at a deep level. Since I was primarily interested in how the personas and context scenarios were used, this was not a huge concern. A future study might consider asking Designers to create more than one object (one familiar and one not) to observe the affect that object familiarity might have on personas/context scenario use.

Since none of the design study participants had object or audience familiarity, it was not possible to observe the interaction of domain, object, and audience familiarity on persona and context scenario use. A future study might consider asking Designers to create a single object for multiple audiences in which one was distant and one was not to explore differences in audience domain familiarity.

Additionally, a study to better explore this communication would bring several Designers in at one time and observe how the personas and context scenarios were used in a team situation. A future study might consider observing teams of designers working with personas and context scenarios to better duplicate a real world situation.

Lastly, it would have been interesting to have had a means by which to judge the final products created. This would have allowed for associations between how the personas/context scenarios were used and the quality of design. A future study might consider setting up a panel of judges to ascertain how the quality of the design is related to how personas/context scenarios were used.

11.5: Major contributions of this study

I believe this study makes several major contributions to the emerging field of HCD and towards bettering the dialogue among UX researchers and Designers in industry. Four contributions include:

1. *An understanding of the usefulness of personas (with context scenarios) and in what ways they can be improved.* This investigation found that personas are effective at helping Designers focus and communicate about end users but are less helpful at helping designers empathize with end users. Conclusions about personas' ability to help designer avoid ill-informed assumptions was mixed. When considering unfamiliar audiences, personas were capable of surprising designers; however, a majority of designers from the survey claimed to have never been surprised by information contained in a persona.
    a. Additionally, this research explored using personas representing end users in which Designers were unfamiliar, which moving forward, is more and more likely to occur in industry as the audiences for technology expand. New and unfamiliar audiences will also change how UX researchers apply current HCD methods; this, of course, is a larger area of study that I expect to explore in the future.

2. *Considering designers as a non-homogenous group.* Much of design research does not attempt to isolate attributes that individual designers bring to a design situation beyond level of expertise. This study found that other differences, for example empathy, may affect how Designers engage materials in the problem space.
3. *Illuminating some differences between those with UX Centric and Designer job titles which in turn emphasized the need for good communication between these two groups in industry.* The comparisons are summarized in depth in Appendix H. Three key differences were: (1) the groups discussed the user differently in an open-ended query about their jobs (see Chapter 4 and Appendix H); (2) Designers scored higher than the UX Centric group in all dimensions of empathy, but especially in the more emotional dimensions (see Chapter 6) and (3) Designer awareness of traditional UCD principles as defined by Gould and Lewis (1985) was significantly lower than the UX Centric group.
4. *Introducing a rhetorical perspective to UX research.* A rhetorical perspective suggests that personas are encoded end users that become negotiated messages between UX research and design. As a negotiated message, the personas must be persuasive. Rhetorical theory also suggests that it is more important that a designer have a clear and focused user in mind than one that is completely aligned to UX research. Recall that Gibson (1950) argued that an effective mock reader concept only required the author to focus on a specific audience; not necessarily the 'right' audience. Gibson argued that a focused image helped authors create a consistent piece of writing that contained the signpost and clues that would allow the real reader to take on the role of the mock reader. Analogous logic suggests that a clear user image will help designers create a clear and consistent user interface. This in turn will help the end users understand and adopt new user interfaces.

HCI /HCD are young and dynamic fields in which UX research is an emerging discipline. As a contributor to these young fields as both a researcher and designer, I believe that we need to provide evidence-based methods for (a) UX research and (b) communication tools that summarize UX research. As such, I feel it is critical for the maturation of HCI/HCD to understand what current methods are effective and under what conditions they are more or less effective. This will lead to the improvement of existing methods and the creation of new and better research and communication tools. Improving UX research and communication will ultimately result in better end user experiences.

Bibliography

Adelson, B., & Soloway, E. (1985). The Role of Domain Experience in Software Design. *IEEE Transactions on Software Engineering, SE-11*(11), 1351-1360.

Adlin, T., Pruitt, J., Goodwin, K., Hynes, C., McGrane, K., Rosenstein, A., et al. (2006, April 22-27). *Putting Personas to Work.* Paper presented at the Proceedings of CHI '06, Montreal, Quebec, Canada.

Akin, Ö. (2001). Variants in Design Cognition. In C. M. Eastman, W. M. McCracken & W. C. Newstetter (Eds.), *Design Knowing and Learning: Cognition in Design Education.* Amsterdam, The Netherlands: Elsevier.

Alexander, C. (1964). *Notes on the Synthesis of Form.* New York, NY, USA: McGraw Hill.

Alexander, C. (1971). The state of the art in design methods. *DMG Newsletter, 5*(3), 1-7.

Antle, A. N. (2006, June 26 - 28). *Child-personas: fact or fiction?.* Paper presented at the Proceedings of the 6th Conference on Designing interactive Systems, DIS '06, University Park, PA, USA.

Atman, C. J., Adams, R. S., Cardella, M. E., Turns, J., Mosborg, S., & Saleem, J. (2007). Engineering Design Processes: A Comparison of Students and Expert Practitioners. *Journal of Engineering Education, 96*(4), 359-379.

Atman, C. J., Chimka, J. R., Bursic, K. M., & Nachtmann, H. L. (1999). A comparison of freshman and senior engineering design processes. *Design Studies, 20*(2), 131-152.

Atman, C. J., & Turns, J. (2001). Studying Engineering Design Learning: Four Verbal Protocol Studies. In C. M. Eastman, W. M. McCracken & W. C. Newstetter (Eds.), *Design Knowing and Learning: Cognition in Design Education* (pp. 37-60). Amsterdam, The Netherlands: Elsevier.

Barlow-Busch, B. (2006). Marketing versus design personas *The Persona Lifecycle* (pp. 602-641). San Fransisco, CA, USA: Elsevier.

Barnum, C. M. (2002). *Usability Testing and Research.* New York, NY, USA: Longman.

Bazerman, C. (1993). Scientific Writing as a Social Act: A review of the Literature of Sociology of Science. In P. V. Anderson, R. J. Brockmann & C. R. Miller (Eds.), *New Essays in Technical And Scientific Communication: Research, Theory, Practice.* Famingdale, NY, USA: Baywood Publishing.

Bias, R. G., & Mayhew, D. J. (Eds.). (2005). *Cost-Justifying Usability, Second Edition: An Update for the Internet Age* (Second ed.). San Francisco, CA, USA: Morgan Kaufmann.

Blomquist, Å., & Arvola, M. (2002, October 19 - 23). *Personas in action: ethnography in an interaction design team.* Paper presented at the Proceedings of the Second Nordic Conference on Human-Computer interaction, NordiCHI '02, Aarhus, Denmark.

Buckminster Fuller (2009). Retrieved June 8, 2009, from http://www.sangraal.com/bucky.htm.

Carroll, J. M. (2000a). Five reasons for scenario-based design. *Interacting with Computers, 13*, 43-60.

Carroll, J. M. (2000b). *Making Use: Scenario-based design of human computer interactions*. Cambridge, MA, USA: Mit Press.

Carroll, J. M. (2001). Scenario-based design: A brief history and rationale. In C. M. Eastman, W. M. McCracken & W. C. Newstetter (Eds.), *Design Knowing and Learning: Cognition in Design Education*. Amsterdam, The Netherlands: Elsevier.

Chang, Y.-J., Hsu, H.-Y., & Wang, T.-Y. (2008, April 21–25). *Action Science Approach to Nonprofit Housing Services using Web 2.0 Mapping Tools.* Paper presented at the World Wide Web, WWW '08, Beijing, China.

Chapman, C. N., Love, E., & Alford, J. L. (2008, 7-10 Jan). *Quantitative Early-Phase User Research Methods: Hard Data for Initial Product Design.* Paper presented at the Proceedings of the 41st Hawaii International Conference on System Sciences, Hawaii, USA.

Chapman, C. N., & Milham, R. P. (2006, October 16-20). *The persona's new clothes: methodological and practical arguments against a popular method.* Paper presented at the Proceedings of the Human Factors and Ergonomics Society 50th Annual Meeting, Santa Monica, CA.

Christiaans, H., & Dorst, K. (1992). *Cognitive Models in Industrial Design Engineering: a protocol study*. Paper presented at the 4th Design Theory and Methodology, DTM '92.

CIA World Factbook (2008). Retrieved September 22, 2008, from https://www.cia.gov/library/publications/the-world-factbook/

Coney, M. B. (1992). Technical readers and their rhetorical roles. *IEEE transactions on professional communication, 35*(2), 149-158.

Coney, M. B., & Steehouder, M. (2000). Guidelines for Designing and Evaluating Personas Online. *Technical Communication, 47*(3), 327-340.

Cooper, A., Reimann, R., & Cronin, D. (2007). *About Face 3: The Essentials of Interaction Design*. Indianapolis, IN, USA: Wiley Publishing.

Cooper, M. (1986). The Ecology of Writing. *College English, 48*(4), 364-375.

Craig, D. L. (2001). Stalking Homo Fabar: A comparison of Research Strategies for Studying Design Behavior. In C. M. Eastman, W. M. McCracken & W. C. Newstetter (Eds.), *Design Knowing and Learning: Cognition in Design Education* (pp. 13-36). Amsterdam, The Netherlands: Elsevier.

Cross, N. (2001). Design Cognition: Results from Protocol and other Empirical Studies of Design Activity. In C. M. Eastman, W. M. McCracken & W. C. Newstetter (Eds.), *Design Knowing and Learning: Cognition in Design Education* (Illustrated ed.). Amsterdam, The Netherlands: Elsevier.

Cross, N. (2004). Expertise in design: an overview. *Design Studies, 25*(5), 427-441.

Cross, N. (2006). Forty years of design research. *Design Studies, 28*(1), 1-4.

Cross, N. (2007a). *Designerly Ways of Knowing*. Basel,Switzerland: Birkhäuser.

Cross, N. (2007b). From a Design Science to a Design Discipline: Understanding Designerly Ways of Knowing and Thinking. In R. Michel (Ed.), *Design Research Now* (pp. 41-54). Berlin, Germany: Birkhäuser.

Cross, N., & Cross, A. C. (1998). Expertise in Engineering Design. *Research in Engineering Design, 10*, 141-149.

Dantin, U. (2005). *Application of personas in user interface design for educational software.* Paper presented at the Proceedings of the 7th Australasian Conference on Computing Education, Newcastle, New South Wales, Australia.

Davis, M. H. (1983). Measuring Individual Differences in Emapthy: Evidence for a Multidimensional Approach. *Jounal of Personality and Social Psychology, 44*(1), 114-126.

Dombrowski, P. M. (2002). Language and Empiricism. *Journal of Writing and Communication, 32*(1), 3-21.

Donner, J., Ghandi, R., Javid, P., Medhi, I., Ratan, A., Toyama, K., et al. (2008). Stages of Design in Technology for Global Development. *Computer, 41*(6), 34-41.

Dorst, K., & Cross, N. (2001). Creativity in the design process:co-evolution of problem-solution. *Design Studies, 22*(5), 425-437.

Ede, L., & Lunsford, A. (1984). Audience Addressed/Audience Invoked: The Role of Audience in Composition Theory and Pedagogy *College Composition and Communication 35*(2), 155-171.

Ericsson, K. A., & Simon, H. A. (1993). *Protocol analysis : verbal reports as data* (Revised ed.). Cambridge, MA, USA: MIT Press.

Flower, L., & Hayes, J. R. (1980). The Cognition of Discovery: Defining a Rhetorical Problem *College Composition and Communication 31*(1), 21-32.

Foucault, B. E., Russell, R. S., & Bell, G. (2004, April 24-29). *Techniques for Researchng and Designing Global Products in an Unstable World: A Case Study.* Paper presented at the Proceedings of CHI '04, Vienna, Austria.

Gibson, W. (1950). Authors, Speakers, Readers, and Mock Readers *College English 11*(5), 265-269.

Go, K., & Carroll, J. M. (2004). The Blind Men and the Elephant: Views of Scenario-Based System Design. *Interactions, 11*(6), 45-53.

Goodwin, K. (2002). Getting from Research to Personas: Harnessing the Power of Data, Retrieved April 23, 2008, from http://www.cooper.com/journal/2002/11/getting_from_research_to_perso.html

Gould, J. D., Boies, S. J., & Lewis, C. (1991). Making usable, useful, productivity-enhancing computer applications. *Communications of the ACM, 34*(1), 74-85.

Gould, J. D., & Lewis, C. (1985). Designing for Usability: Key Principles and What Designers Think. *Communications of the ACM 28*(3), 300 - 311.

Grudin, J. (2006). Why Persona's work: The psychological evidence *The Persona Lifecycle* (pp. 642-663). San Fransisco, CA, USA: Elsevier.

Grudin, J., & Pruitt, J. (2002). *Personas, Participatory Design and Product Development: An Infrastructure for Engagement.* Paper presented at the Proceedings of the Participartory Design Conference, PDC'02.

Guindon, R. (1990). Knowledge Exploited by Experts During Software System Design. *International Journal of Man-Machine Studies, 33*(3), 279-304.

Guralinik, D. B. (Ed.) (1976) Webster's New World Dictionary of the American Language. . Cleveland, OH, USA: William Collins and World Publishing.

Hamilton, G. H. (1970). *19th and 20th Century Art: Painting - Sculpture - Architecture* (First ed.). New York, NY, USA: Harry N. Abrams, Inc.

Hanington, B. (2003). Methods in the Making": A Perspective on the State of Human Research in Design. *Design Issues, 19*(4), 9-18.

Head, A. J. (2003). Personas: Setting the Stage For Building Usable Information Sites. *Online, 27*(4).

Hill, V., & Bartek, V. (2007, March 30–31). *Telling the User's Story.* Paper presented at the Symposium on Computer Human interaction For the Management of information Technology Cambridge, MA, U.S.A.

Jacobson, I. (1995). The use-case construct in object-oriented software engineering. In J. M. Carroll (Ed.), *Scenario-based design: Envisioning work and technology in system development* (pp. 309-336). New York, NY, USA: John Wiley & Sons.

Johnson, R. R. (1998). *User-centered technology: A rhetorical theory for computers and other mundane artifacts.* Albany, NY, USA: State University of New York.

Junior, P. T. A., & Filgueiras, L. V. L. (2005). *User Modeling with Personas.* Paper presented at the Proceedings of the 2005 Latin American conference on Human-computer interaction, CHIHIC'05, Cuernavaca, Mexico.

Kahn, H. (1962). *Thinking about the unthinkable.* New York, NY, USA: Horizon Press.

Kam, M., Bhagwani, S., Kumar, A., Lal, S., Mathur, A., Tewari, A., et al. (2007, December 15-16). *The social complexities of usercentered design in ICTD: Experiences from four schools in India's villages and slums.* Paper presented at the Proceedings of the 2nd IEEE/ACM International Conference on Information and Communication Technologies and Development, Bangalore, India.

Khalayli, N., Terum, T., Nyhus, S. I., & Hamnes, K. (2007, April 28- May 3). *Persona Based Rapid Usability Kick-Off.* Paper presented at the Proceedings of CHI '07, San Jose, California, USA.

Kolko, B., Johnson, E., & Rose, E. (2007). Mobile Social Software for the Developing World *Online Communities and Social Computing* (pp. 385--394). Berlin / Heidelberg, Germany: Springer.

Kolodner, J. L., & Wills, L. M. (1996). Powers of observation in creative design. *Design Studies, 17*(4), 385-416.

Koskimies, K., Systä, T., Tuomi, J., & Männistö, T. (1998). Automated support for modeling OO software. *IEEE Software, 15*(1), 87-94.

Krippendorff, K. (2006). *The Semantic Turn: a new foundation for design.* Boca Raton, FL, USA: Taylor & Francis Group.

Krippendorff, K. (2007). Design Research, an Oxymoron? In R. Michel (Ed.), *Design Research Now* (pp. 67-80). Berlin, Germany: Birkhäuser.

Kruger, C., & Cross, N. (2006). Solution driven versus problem driven design: strategies and outcomes. *Design Studies, 27*(5), 527-548.

Kuehnast, K., & Dudwick, N. (2004). *Better a Hundred Friends than a Hundred Rubles? Social Networks in Transition - The Kyrgyz Republic* (Illustrated ed.): World Bank.

Kuhn, T. S. (1996). *The Structure of Scientific Revolutions* (Third ed.). Chicago, IL, USA: University Of Chicago Press.

Kuniavsky, M. (2003). User Profiles *In Observing the user experience: A Practitioners guide to user research* (pp. 129-159). San Francisco, CA, USA: Morgan Kaufman Publishers.

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*, 159-174.

Laurel, B. (2003). Muscular Design. In B. Laurel (Ed.), *Design Research: Methods and Perspectives* (pp. 16-19). Massachusetts, MA, USA: The MIT Press.

Lawson, B. (1979). Cognitive Strategies in Architectural Design. *Ergonmics, 22*(1), 59-68.

Lawson, B. (2006). *How Designers Think: The design process demystified* (Fourth ed.). London, UK: Elsevier.

Lloyd, P., Lawson, B., & Scott, P. (1995). Can concurrent verbalization reveal design cognition? *Design Studies, 16*(2), 237-259.

Mar, R. A., Oatley, K., Hirsh, J., Paz, J. d., & Peterson, J. B. (2006). Bookworms versus nerds: Exposure to fiction versus non-fiction, divergent associations with social ability and the simulation of fictional social worlds. *Journal of Research in Personality, 40.*

March, L. (1976). The logic of Design and Question of Value. In L. J. March (Ed.), *The Architecture of Form.* Cambridge, UK: Cambridge University Press.

Markensten, E., & Artman, H. (2004, October 23-27). *Procuring a Usable System Using Unemployed Personas.* Paper presented at the Proceedings of the Second Nordic Conference on Human-Computer interaction, NordiCHI '04, Tampere, Finland.

Maunder, A., Marsden, G., Gruijters, D., & Blake, E. (2007). *Designing interactive systems for the developing world: Reflections on user-centred design.* Paper presented at the Proceedings of the 2nd IEEE/ACM International Conference on Information and Communication Technologies and Development, Bangalore, India.

McGinn, J., & Kotamraju, N. (2008, April 5-10). *Data-Driven Persona Development.* Paper presented at the Proceedings of CHI '08, Florence, Italy.

Melican, J. P. (2000). *Describing user-centered designing: How design teams apply user resarch data in creative problem-solving.* Illinois institue of Technology, Illinois.

Miaskiewicz, T., Sumner, T., & Kozar, K. A. (2008, April 5-10). *A Latent Semantic Analysis Methodology for the Identification and Creation of Personas.* Paper presented at the Proceedings of CHI '08, Florence, Italy.

Michel, R. (2007). Introduction. In R. Michel (Ed.), *Design Research Now* (pp. 15-17). Berlin, Germany: Birkhäuser.

Mikkelson, N., & Lee, W. O. (2000). *Incorporationg User Archetypes into Scenario-Based Design.* Paper presented at the UPA Workshop.

Miller, C. R. (1979). A Humanistic Rationale for Technical Writing. *College English, 40*, 610-617.

Mulder, S., & Yaar, Z. (2007). *The user is always right : a practical guide to creating and using personas for the Web.* Berkeley, CA, USA: New Riders.

Muller, M. J. (2003). Participatory Design: The Third Space in Human-Computer Interaction. In J. A. Jacko & A. Sears (Eds.), *The Human-Computer Ineraction Handbook* (pp. 1051-1068). Mahwah, NJ, USA: Lawrence Elrbaum Associates.

Newstetter, W. C., Eastman, C. M., & McCracken, W. M. (2001). Introduction: Bringing Design Knowing and Learning Together. In C. M. Eastman, W. M. McCracken & W. C. Newstetter (Eds.), *Design Knowing and Learning: Cognition in Design Education* (pp. 1-11). Amsterdam, The Netherlands: Elsevier.

Newstetter, W. C., & McCracken, W. M. (2001). Novice conceptions of design: Implication s for the design of learning environments. In C. M. Eastman, W. M. McCracken & W. C. Newstetter (Eds.), *Design Knowing and Learning: Cognition in Design Education.* Amsterdam, The Netherlands: Elsevier.

Nieters, J. E., Ivaturi, S., & Ahmed, I. (2007, April 28- May 3). *Making Personas Memorable.* Paper presented at the Proceedings of CHI '07, San Jose, California, USA.

Oatley, K. (2008). The science of fiction. *New Scientist, 198*, 42-43.

Ong, W. J. (1975). The Writer's Audience Is Always a Fiction *PMLA 90*(1), 9-21

Özdemir, G., & Clark, D. B. (2007). An Overview of Conceptual Change Theories. *Eurasia Journal of Mathematics, Science & Technology Education, 3*(4), 351-361.

Passer, M. W., & Smith, R. E. (2004). *Psychology: The Science of Mind and Behavior* (Second ed.). New York, NY, USA: McGraw-Hill.

Patton, M. Q. (2002). *Qualitative Research & Evaluation Methods* (Third ed.). Thousand Oaks, CA, USA: Sage Publications.

Portigal, S. (2008). TRUE TALES: Persona Non Grata. *Interactions, 15*(1), 72-73.

Potts, C. (1995). *Using Schematic Scenarios to Understand User Needs.* Paper presented at the DIS '95, Ann Arbor, MI.

Pruitt, J., & Adlin, T. (2006). *The Persona Lifecycle.* San Fransisco, CA, USA: Elsevier.

Pruitt, J., & Grudin, J. (2003, June 06 - 07). *Personas: practice and theory.* Paper presented at the Proceedings of the 2003 Conference on Designing For User Experiences, DUX '03, San Francisco, California.

Putnam, C., & Kolko, B. (2009, July 20-22). *Getting Online but still living offline: the complex relationship of technology adoption and in-person social networks.* Paper presented at the Proceedings of Advances in Social Networks and Mining, ASONAM '09, Athens, Greece.

Putnam, C., Rose, E., Johnson, E., & Kolko, B. (2009). Adapting User-Centered Design Methods to Design For Diverse Populations. *In Special HCI4D Issue of Information Technologies and International Development(ITID), 5*(4), 51-74.

Quesenbery, W. (2006). Storytelling and narrative *The Persona Lifecycle* (pp. 520-555). San Fransisco, CA, USA: Elsevier.

Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a General Theory of Planning *Policy Sciences 4*(2), 155-169.

Rönkkö, K. (2005). *An Empirical Study Demonstrating How Different Design Constraints, Project Organization and Contexts Limited the Utility of Personas.* Paper presented at the Proceedings of the 38th Annual Hawaii International Conference on System Sciences (HICSS'05).

Rönkkö, K., Hellman, M., Kilander, B., & Dittrich, Y. (2004). *Personas is not Applicable: Local Remedies Interpreted in a Wider Context* Paper presented at the Proceedings Participatory Design Conference, Toronto, Canada.

Rosson, M. B., & Carroll, J. M. (2003). Scenario-Based Design. In J. A. Jacko & A. Sears (Eds.), *The Human-Computer Interaction Handbook: Fundamentals, Evolving Technologies and Emerging Applications* (pp. 1032-1050). Mahwah, NJ, USA: Lawrence Erlbaum Associates.

Rowland, G. (1992). What do instructional designers really do - performance Improvement. *Quarterly, 5*(2), 65-86.

Rubinstein, R., & Hersh, H. M. (1984). *The Human Factor: Designing computer systems for people.* Burlington, VT, USA: Digital Press.

Salkind, N. J. (2004). *Statistics for People Who (Think They) Hate Statistics* (Second ed.). Thousand Oaks, CA, USA: Sage Publications.

Schön, D. (1983). *The Reflective Practitioner: How Professionals Think in Action.* London: Temple Smith.

Schraagen, J. M. (1993). How Experts Sovle a Novel Problem in Expertimental Design. *Cognitive Science, 17*, 285-309.

Selick, H., Burton, T., McDowell, M., & Thompson, C. (Writer) (1993). The Nightmare Before Christmas. In T. Burton (Producer). USA: Touchstone Pictures.

Simon, H. (1969). *The Sciences of the Artificial.* Cambridge, MA, USA: MIT Press.

Sinha, R. (2003, April 5-10). *Persona Development for Information-rich Domains.* Paper presented at the Proceedings of CHI '03 Extended Abstracts on Human Factors in Computing Systems, Ft. Lauderdale, Florida, USA.

Slack, J. D., Miller, D. J., & Doak, J. (2006). The Technical Communciation as Author: Meaning, Power, Authority. In J. B. Scott, B. Longo & K. V. Wills (Eds.), *Critical Power Tools.* Albany, NY, USA: State University of New York.

Stappers, P. J. (2007). Doing Design as Part of Doing Research. In R. Michel (Ed.), *Design Research Now.* Berlin, Germany: Birkhäuser.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics* (Fifth ed.). Boston, MA: Pearson Education.

Thomas, J. C., & Carroll, J. M. (1979). The Psychological Study of Design. *Design Studies, 1*(1), 5-11.

Törpel, B. (2005). *Participatory design: a multi-voiced effort.* Paper presented at the Proceedings of the 4th decennial conference on Critical computing: between sense and sensibility.

Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. In M. Cole, V. John-Steiner, S. Scribner & E. Souberman (Eds.). Cambridge, MA, USA: Harvard University Press.

Wirfs-Brock, R. J. (1993). Designing Scenarios: Making the Case for a Use Case Framework. *The Smalltalk Report, 3*(3).

Wirfs-Brock, R. J. (1995). Designing Objects and Their Interactions: A Brief Look at Responsibility Driven Design. In J. M. Carroll (Ed.), *Scenario-based design: Envisioning work and technology in system development* (pp. 337-360). Toronto, Canada: John Wiley & Sons.

Zimring, C., & Craig, D. L. (2001). Defining Design between Domains: An Argument for Design Research a la Carte. In C. M. Eastman, W. M. McCracken & W. C. Newstetter (Eds.), *Design Knowing and Learning: Cognition in Design Education.* Amsterdam, The Netherlands: Elsevier.

Appendix A: Case study - creating distant personas and scenarios

In this appendix, I explore the secondary research question of this dissertation: how UX researchers may need to consider method modifications for researching distant audiences. Using a case study of mobile users in Kyrgyzstan, I report on the differences I found between (a) the procedures for gathering information and creating personas and scenarios as presented in the literature, and (b) the procedures for gathering information and creating personas and scenarios that represented mobile phone users in Kyrgyzstan. Much of what is contained in Appendix A was also part of a published article (Putnam, Rose, Johnson, & Kolko, 2009).

The article was written with co authors, Emma Rose, Erica Johnson and Beth Kolko; they (and myself) represent the 'we' referred to in the article and this appendix. This research was conducted as part of the Central Asia + Information and Communication Technology project (CAICT), a multiyear study of the use of information and technologies in Central Asia. The chapter is organized as follows: introduction (section A.1), research methods (section A.2), a model for using existing data (section A.3), findings which are the personas and context scenario results (section A.4), and discussion (section A.5).

A.1: Introduction

As designers and researchers who have worked in settings in both the United States and in developing regions, we have come to recognize that traditional approaches to human-centered design (HCD) methods are difficult to deploy in developing regions (Kam, et al., 2007; Maunder, Marsden, Gruijters, & Blake, 2007). These difficulties are not confined to developing regions, but also apply to potential users from a substantively different cultural context (i.e., diverse populations) than that in which technology design occurs; as such, adaptations to existing HCD methods is often required. In this appendix, I am specifically addressing the adaptations that we

made for using two HCD methods, (personas and context scenarios)[91], for one diverse population (mobile users in Kyrgyzstan). In the next sections, we provide background material in which we briefly describe Kyrgyzstan (section A.1.1). This is followed by a detailed discussion of the MoSoSo product concept that inspired this case study (section A.1.2). Finally, we discuss challenges and solutions for creating personas and context scenarios when there is limited access to end users (section A.1.3).

A.1.1: Kyrgyzstan

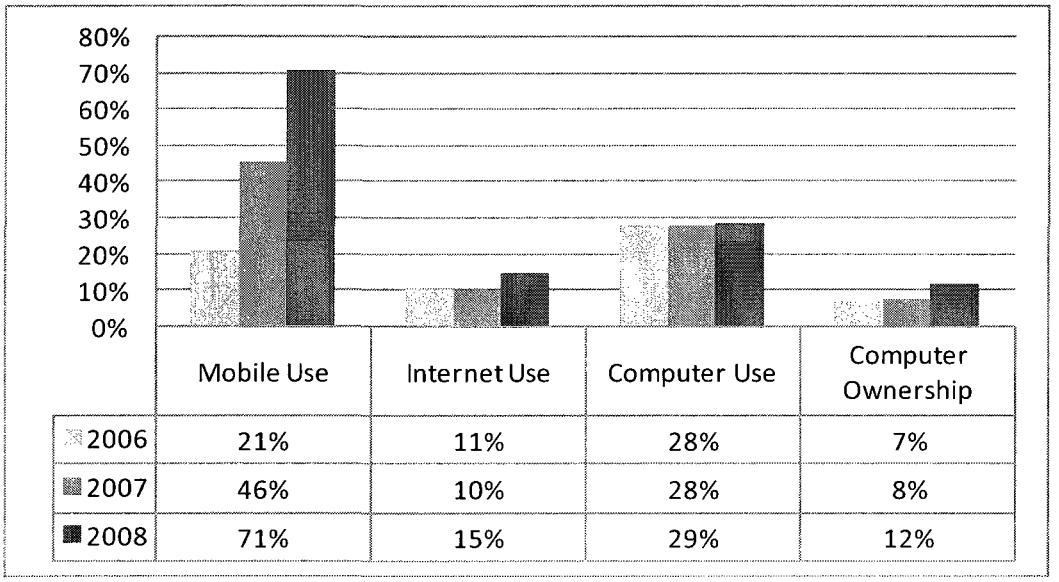
Kyrgyzstan is a post-Soviet country transitioning to a capitalist economy. The population, estimated at 5.5 million, is concentrated in the capital city of Bishkek in the north and in the heavily agricultural Ferghana Valley in the south. The country's population is very literate, with a literacy rate of 99%, and young, with a median age of 24.2 years (by comparison, the U.S. median age is 36.7). The ethnicity of the population is mostly Kyrgyz (65%), followed by Uzbek (14%), and Russian (13%). Most Kyrgyz (about 75%) consider themselves Muslims ("CIA World Factbook," 2008) .

Face-to-face social networks are critically important in the region (Kuehnast & Dudwick, 2004) . Social networks serve as avenues for gathering and sharing information, assistance, and goods. They also offset the lack of reliable and trusted information from public institutions, such as the government, police, and court system (Kolko, Johnson, & Rose, 2007). We have also found that technology is positively associated with an individual's use and trust of their face-to-face social network (family, friends, and neighbors) for multiple types of information seeking (Putnam & Kolko, 2009).

In addition, technology growth in Central Asia has not followed the same pattern as in the West. As shown in Figure 110, Internet and computer use remain relatively low, whereas mobile phone use has increased at a rate of about 25% per

[91] See Chapter 2 for background information about personas and context scenarios.

year.[92] Combined with the importance of social networks, rapid mobile phone adoption provides opportunities for designing appropriate technologies that leverage existing patterns. This goal inspired our initial product concept of the MoSoSo directory.



	Mobile Use	Internet Use	Computer Use	Computer Ownership
2006	21%	11%	28%	7%
2007	46%	10%	28%	8%
2008	71%	15%	29%	12%

Figure 110: Technology trends in Kyrgyzstan

A.1.2: Mobile social software (MoSoSo) directory concept

The responses of people in Kyrgyzstan in focus groups and interviews, as well as to surveys, prompted the idea for a mobile software service that would act like a Yellow Pages delivered via mobile phone and that would also leverage social networks. When Kyrgyzstan was part of the Soviet Union (prior to 1991) information directories were available, but no longer exist today. Some business directories can be purchased in some bookstores, but these publications do not include listings of everyday services and they are primarily geared for the foreigner and Non-government organization (NGO) community. Moreover, although two free information lines operate in the country (similar to 411), respondents complained that it could take all day to reach an operator, and it is expensive to call the landline-based information

[92] However, we found that increased mobile phone usage has not resulted in high levels of mobile Internet usage.

service with a mobile phone. Throughout our work, the theme of scant public information resources has been noted. Thus, a technological solution that leverages the possibility of user-generated content seemed a likely grassroots solution to the information scarcity problem. Specifically, we identified a need for a recommendations tool/service to fill a niche, similar to what Internet sites like "Angie's List" and online retailers like Amazon.com do in the United States. With low Internet penetration, we reasoned that Internet-based solutions would not attract the necessary volume of users to make a directory based on user recommendations useful or trustworthy. An appropriate solution to the information problem would, instead, leverage mobile phones.

In summation, three key factors inspired the shape of the service: (a) no standard phone directories are available in the country; (b) Kyrgyz highly value close social networks for information, assistance, and goods; and (c) there is a strong upward trend in mobile phone use and ownership in Kyrgyzstan whereas the growth of computer and Internet use is relatively flat. Ideally, after we identified the MoSoSo directory as a tenable concept, we would then have conducted field studies to elicit specific user requirements and collected data specifically for personas and design scenarios.

A.1.3: Limited access to users

The creation of personas and scenarios commonly uses face-to-face interviews and observation studies to examine current and possible future uses of a specific product or service (Cooper et al., 2007). When designing products for the developing world or other diverse communities, however, these common research methods are not always viable for many reasons: Budgets are limited, the ability to perform firsthand onsite research can be challenging without extensive local knowledge, and product cycle time frames can limit the feasibility of field research. Each of these factors might prevent the in-depth study of a target market that would be typical for traditional approaches to persona and scenario creation. In sum, access to users is limited.

Unfortunately, there are very few examples in the literature that discuss complications when creating personas/scenarios that do not assume this perspective of access to end-users. In one example, Antle (2006) explored the differences she encountered when creating personas that represented children that would use an online mentoring application created for CBC4Kids.ca. The author found differences between creating adult and child personas that included: (1) limited access to child users; (2) users that cannot verbalize needs and attitudes in relationship to a design concept; and (3) a segmentation model based on generalized child needs rather than needs or goals associated with the product, for example, the need to find security (Antle, 2006).

In a similar investigation three researchers from Intel, Foucault, Russell and Bell (2004), describe field work modifications they made while developing a technology product for users in China during the SARs (2002) outbreak in which they had limited access to users due to a travel ban. The authors used a combination of approaches to learn about their end users including books, video, interviewing researchers familiar to the region, and creating a 'culture capsule' (Foucault, Russell, & Bell, 2004). The 'cultural capsule' was a conference room populated with objects from China, including books, jewelry boxes, technology, and political and religious paraphernalia. Additionally, they brought in local Chinese university exchange students to validate the culture capsule items and provide live informants.

Our solution to the challenge of limited user access was to use data that was otherwise available; we argue that this approach will generalize to other similar investigations. Many countries, market research firms, and academics conduct social survey work and ethnographies. Global projects, such as the World Values Survey or the World Internet Project, provide overviews of populations, their attitudes, and patterns of media and technology usage. Anthropologists produce ethnographies about societies around the world, and sociologists conduct in-depth studies that designers could repurpose if they had a methodology to do so.

However, using data that are otherwise available introduces additional challenges. It is typically assumed that research to create personas and scenarios is conducted with a specific product or service in mind. Our research did not fit the traditional mold as it was not associated with a specific product. Rather, it was culled from existing general social research.

As members of the CAICT group, we have collected thousands of data points pertaining to attitudes, behaviors, and goals in relation to technologies used throughout the region. CAICT's field research, then, was not about the design of a specific product or service. Rather, it was general research collected over several years, some of which had a design focus, and some of which was geared to larger social issues. We believe the ability to leverage existing data sources to create personas and context scenarios expands the utility of HCD methods. Because many existing data sources (e.g., the World Values Survey or the World Internet Project) are readily available, we argue that this case study can be generalized to other design projects for developing regions or for resource-constrained or diverse communities.

A.2: Research methods

Our personas and context scenarios were created using data from two previous CAICT studies: (a) a 2007 survey of 1,000 respondents in Kyrgyzstan, and (b) 16 interviews, with 12 participants. Neither study focused on user requirements or the creation of personas and scenarios for a specific product or service. The survey was conducted to identify attitudes and behaviors associated with technology use, and the focus groups and interviews were conducted to identify how mobile phones support existing and new social networks.

Using statistical analyses of the survey data and information from the interviews, we created three personas, each with an accompanying context scenario to communicate user requirements for the proposed MoSoSo directory application. This case study demonstrates that researchers can use accepted HCD methods (personas and scenarios) to help designers make appropriate technology design decisions, even when

they lack the resources to conduct firsthand research on a given product or service. Our effort thus acknowledges the constraints facing many researchers and design teams who lack institutional support and/or budgets that allow for research studies focused on product design.

A.2.1: Data collection methods

As we did not have the luxury of conducting primary research focused on the MoSoSo directory, we used two sets of previously collected data to create the personas and scenarios. The characteristics of each dataset are described below.

A.2.1.1: Survey data

The first set of data was from an April–May 2007 large-scale social survey of 1,000 respondents, aged 15 and older, that was administered in urban and rural areas in several regions in Kyrgyzstan. The survey sample was based on government census information on age, gender, ethnicity, and geographic location. The sample included 50 sampling locations, with 12–29 respondents interviewed in each location. The survey instrument was designed by a team of researchers from the University of Washington. The BRiF Research Group, located in Kazakhstan, administered the survey. Households were selected by a random walk procedure. Then each household respondent was chosen using the Kish Grid method, a common technique to ensure a random selection of household members (Kish, 1949).

A.2.1.2: Focus Group and Interview Data

The second set of data used to inform the personas and scenarios was from focus groups and interviews conducted by three University of Washington researchers in two Kyrgyzstan sites: the capital city of Bishkek and Kara Balta, a smaller suburban city. Researchers conducted two sessions in each location; each session involved a focus group and individual interview of three individuals, for a total of 12 adult participants. This data identified mobile phone usage patterns that inform the maintenance of social networks.

A.3: A model for using existing data

In the following sections, we discuss how traditional user research approaches presented in the literature for creating personas and scenarios were modified. Instructional sources for persona creation are mostly published in popular non-academic literature and are written primarily as introductory guides to HCD practices; as such, they are generally endorsements of persona use based on the authors' professional experiences. Typically the authors have extensive HCD experience which lends credibility to their claims. On one hand, this of course makes sense, since it would seem pointless to give instruction for a method that you did not endorse. However, this means that the instructional sources are summations of the authors' own methods of persona creation developed from within their own practices, as such, there is little cohesion or agreement on how to create personas.

While there is no one recipe for creating personas and scenarios, the literature agrees on three basic steps: (a) collect data about users, (b) segment the users, and (c) create a persona for each user segment and develop context scenarios for each persona (Cooper et al., 2007; Pruitt & Adlin, 2006). Context scenarios should illustrate the persona interacting with the product and reflect a usage goal that persona has for the product or service (Cooper et al., 2007). As we were using existing data, the first step was complete.

A.3.1: Segment the users (step 2): literature suggestions

While marketing segments are typically defined to hone a message for increasing sales aimed at the consumer (buyer), segments for personas focus on the person(s) who will ultimately use a product (user). Demographics, psychographics (psychological factors that drive behaviors), and job roles are common approaches for marketing segmentation(Barlow-Busch, 2006). These approaches are also valid in persona segmentation, but the literature stresses focusing on differences in uses of the product for persona segments.

Segmentation is the process of analyzing the collected data into groupings that will later become encapsulated by personas. Analysis methods are largely determined by the type (qualitative, quantitative or both) and the research questions that drove the research phase. Additionally, the capabilities of the team may affect the analysis methods, for example, knowledge of statistics is required for some of the suggested quantitative methods.

Pruitt and Aldin (2006) in their lifecycle analogy refer to the segmentation phase as 'conception'. They break conception into three steps. The first step involves identifying important classes of end users based on user roles, goals and/or market segmentation from the available research data. The second step involves evaluating the research data through the lens of the identified end user classes. Affinity diagramming is the suggested method for qualitative data, in which end user 'factoids' derived from research are placed on sticky notes and clustered into logical groupings under the pre-identified end user classes. The text displays these sticky note clusters organized on a surface around a larger category label as factoid groupings are collected into categories and subcategories. In step three of 'conception', these categories and subcategories form the basis for 'persona skeletons', which are comprised of bullet points of distinguishing data.

Following the Cooper qualitative research method, interview participants are placed on several spectrums based on their answers to the behavioral questions from phase one, for a spectrum example see Figure 111 (A. Cooper, et al., 2007; Goodwin, 2002). Cooper suggests looking for patterns across six to eight spectrums to identify similar end user clusters. Once the end users are clustered into groups, goals are both inferred from behaviors and identifying how members of each group answered goal-oriented questions. Each group is also attributed with demographic details, and aptitudes and skill levels based on the composition of the real users in the clustered group.



Figure 111: Example of Cooper et.al. (2007) persona segmentation spectrum [93]

Mulder and Yaar (2007) suggest a different priority order for segmentation: they suggest starting with goals, followed by product usage lifecycle, attitudes and behaviors, and lastly demographics. The authors argue for use of quantitative data whenever possible, to either supplement qualitative data or as the primary data source; however, they emphasize that "your decision to use quantitative research comes back to your audience...do they need statistically significant evidence before jumping onboard your persona bandwagon?" In addition, as part of an Internet consulting firm, the authors report witnessing a trend of an increasing need for quantitative methods; a need they argue is fueled by market research groups who do not currently find personas persuasive because they are based on samples sizes too small to attain statistical significance.

Suggested quantitative data analysis in the literature, includes both univariate and multivariate techniques. Cross-tabs/Chi-square tests and ANOVAs are suggested to compare group differences.[94] Multivariate methods include various types of data reduction through factor analysis using either principle components analysis[95] (PCA) (Chapman, et al., 2008; Sinha, 2003), exploratory factor analysis (EFA) (McGinn & Kotamraju, 2008), and/or latent semantic analysis (LSA) (Miaskiewicz, Sumner, &

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[93] Note, this is an example of a continuous variable spectrum. However, categorical variable spectrums, which include dichotomous variables, are also suggested.

[94] There is virtually no discussion of Type I error rate inflation in the literature. While this is not a huge concern since this is a non-experimental evaluation of data; however, evaluating group differences based on univariate tests alone may highlight group differences that may not exist but appear to exist due to Type I error inflation.

[95] Note that PCA is a simple mathematical data reduction - not a statistical model. As such, PCAs are often used to reduce the number of variables prior to subsequent exploratory factor analysis (EFA) which (unlike PCA's) can statistically calculate significance (i.e. error variance) (Tabachnick & Fidell, 2007).

Kozar, 2008). LSA differs from more traditional factor analysis (PCA, EFA, etc.) because instead of using variables with numerical properties it starts by analyzing natural language; the method searches for relationships between terms and concepts among interviewee answers. Once the UX research data has been segmented into separate end user groups the last phase of persona creation (i.e. presentation, implementation) occurs.

A.3.2: Segment the users (step 2): what we did

As discussed, in two key areas, our data sources were much different than those typically used: (a) rarely have other publications addressed a process that used data not collected in relationship to a specific product, and (b) one dataset was from a survey that led us to use several quantitative methods. (Using quantitative methods in the creation of personas is rarely discussed in the dominant literature.[96])

A.3.2.1: Persona Segmentation Using Survey Data.

In our survey results, 460 respondents owned mobile phones. We segmented respondents via survey questions that most closely pertained to goals, as suggested by Mulder and Yaar (2007). These questions asked respondents whether they agreed or disagreed with 12 motivations (reasons) for why they acquired a mobile phone. Respondents could agree to multiple motivations, as shown in Table 52. This was our first modification to cited methods. Although research would typically inform goals in relationship to a specific product, we focused on motivations related to the technology that would deliver the service.

Using Phi correlations, we discovered significant positive relationships that broke into three logical groupings: (a) the motivation to replace a home phone; (b) practical motivations, including a need to make calls and mobile phone affordability;

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[96] The few examples of publications that discuss quantitative persona segmentation include Chapman, Love, and Alford (2008) and Mulder and Yaar (2007).

and (c) social motivations, which included a desire to receive calls and a need for a mobile phone because friends had them.

Table 52: Phi Correlations for Motivations to Acquire a Mobile Phone[97]

	n	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1 .I do not have a home phone	460	--											
2. My home phone is bad quality	460	.08	--										
3. It takes too long to get a home phone	460	**.20** **	**.19** **	--									
4. To make calls when away from home	460	-.25 **	-.04	-.06	--								
5. It is cheaper than a home phone	460	.03	-.03	-.03	.06	--							
6. I got a good price	460	.04	-.04	-.04	**.19** **	**.36** **	--						
7. My friends all have mobile phones	460	.02 *	-.01	.03	-.02	**.35** **	**.32** **	--					
8. I like to receive voicemail	460	-.02	.19 **	-.02	-.06	-.03	.09	**.26** **	--				
9. I like people to reach me at all times	460	-.14 **	.03	.02	-.32 **	.09	**.17** **	**.13** **	.05	--			
10. Easier to make international calls	460	-.01	-.03	.05	-.19 **	-.04	-.05	-.04	-.03	-.09 *	--		
11. I need it for work	460	-.26	-.01	-.10	-.01	-.01	-.02	-.03	-.01	-.05	-.01	--	
12. Convenience	460	-.08	-.03	-.03	-.03	-.04	-.05	-.04	-.04	-.04	-.04	**.17** **	--

A.3.2.2: Final Groupings.

We next placed the respondents in one of three groups based on their responses. We found that 354 of the 460 respondents who owned mobile phones claimed motivations that fell into one of the three final motivation groups without overlap. Our final three groups are discussed below.

A.3.2.2a: Replacement group. In the final segmentation model, there were 46 (13%) individuals in the replacement motivation group. A large majority (84%) of this group reported not having a phone at home, 7% said their home phone line was bad quality, and 9% thought that home phones took too long to install. Therefore, the primary driving replacement motivation of this group was a lack of a home phone.

A.3.2.2b: Practical group. There were 195 (55%) individuals in the practical motivation group. Almost all members of this group (99%) indicated a need to make calls when away from home or work as the motivation for acquiring a mobile phone. Some (2%) were also motivated by mobile phones being cheaper to purchase than landlines and another 2% by getting a good price for the phone. The primary driving

[97] Notes: Positive significant correlations are in bold face. Statements are reordered here to emphasize groupings; the last three statements were not significantly positively associated with any of the three groupings, so they were omitted from evaluation.

motivation of this group was a desire to make outgoing calls when they were away from landlines at home or work.

A.3.2.2c: Social group. There were 113 (32%) individuals in the social motivation group. A majority (85%) wanted people to reach them at all times, 19% got their mobile phone because their friends had them, and 4% wanted to receive voice mail. Therefore, the primary driving motivation of this group was a desire to receive incoming calls at all times.

A.3.2.2d: Summary. Note that the primary motivation of each group was significantly negatively associated with the other primary motivation statements. These negative associations confirmed the logic of our initial persona segmentation groupings. In sum, we first looked for an appropriate survey question that captured how users would use the MoSoSo directory and that approximated user goals when using the product. After choosing "user motivation for acquisition of their mobile phone," we determined if there were, indeed, distinct groups through significant Phi correlations. Once satisfied that these groups were potentially different, we determined that the three groups differed in other areas as detailed in the next sections.

A.3.2.3: Persona Group Differences.

We analyzed the survey data through the lens of our proposed three groups to look for important group differences. Using multivariate analyses of variance (MANOVAs), we conducted omnibus tests on three constructs relevant to our personas: (a) demographics; (b) mobile phone attitudes, behaviors, and experience; and (c) other technology.

A.3.2.3a: Construct One: Demographics. There were 10 variables in this construct, including age, years of schooling, living in an urban versus rural location, household size, gender, marital status, number of children, self-reported socio-economic status (SES), employment status, and student status.

A.3.2.3b: Construct Two: Mobile phone attitudes, behaviors, and experience. There were 22 variables in this construct. Ten variables asked respondents to rate

several attitudes about mobile phones on a scale of 1–4. Eight variables asked respondents to report on possible mobile phone usage behaviors. One variable focused on the respondent's actual mobile phone usage patterns. Another variable explored how respondents acquired their first phones,[98] and still another asked respondents how much they would miss their phones if they no longer had them.[99] The last variable in this construct examined the frequency of mobile phone use.[100]

A.3.2.3c: Construct Three: Other technology. There were seven variables in this construct, including computer ownership, computer and Internet use, frequency of computer and Internet use, landline ownership, and cable or satellite TV availability in the home.

A.3.2.3d: Checking assumptions. Several steps were taken to assure assumptions for MANOVA tests were met. Homogeneity of variance/covariance was tested through Box's Test of Equality (Tabachnick & Fidell, 2007). Whereas the first two constructs met the Box test requirements, Construct 3 did not and therefore could not be analyzed through a MANOVA. Consequently, items for Construct 3 were analyzed using univariate ANOVA and Chi-square tests, with a Bonferroni adjusted alpha.

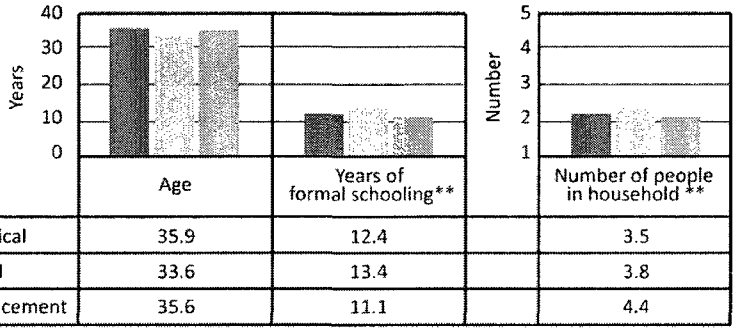
A.3.2.4 Construct One: Demographics.

The groups differed on the best linear combination of the 10 demographic outcomes, Wilks'$\Lambda = 0.868$, $F_{(20, 684)} = 2.52$, $p < 0.001$, $\eta 2 = 0.069$, meaning that approximately 7% of the variance is accounted for by demographic group differences. Follow-up, pair-wise comparisons, using a Bonferroni adjustment, showed that groups differed significantly on three of the 10 variables in the construct: years of schooling, living in an urban versus rural location, and household size. In Figure 112, we also

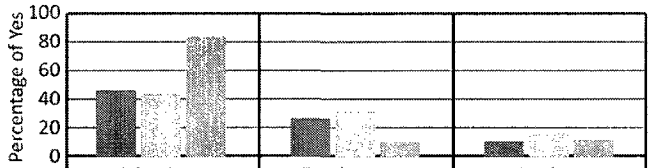
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[98] This variable was dummy coded (0, 1): Received as a gift (the most common answer) was coded as 1.
[99] Most (52%) said they would miss their phone "a lot," skewing the data; therefore, the variable was dummy coded so that "a lot" was coded as 1 and all other answers coded as 0.
[100] Most (73%) used their phone several times a day, which introduced skewed data; therefore, the variable was dummy coded so that "several times a day" was coded as 1 and all other answers were coded as 0.

show findings that were important to the persona descriptions, but non-significant in the MANOVA model, including average age, employment status, and student status.



	Age	Years of formal schooling**		Number of people in household **
Practical	35.9	12.4		3.5
Social	33.6	13.4		3.8
Replacement	35.6	11.1		4.4



	Living in an urban local **	Employment Status	Student Status
Practical	44%	25%	14%
Social	42%	30%	18%
Replacement	82%	13%	16%

Figure 112: Construct One: Notable Differences in Demographics[101]

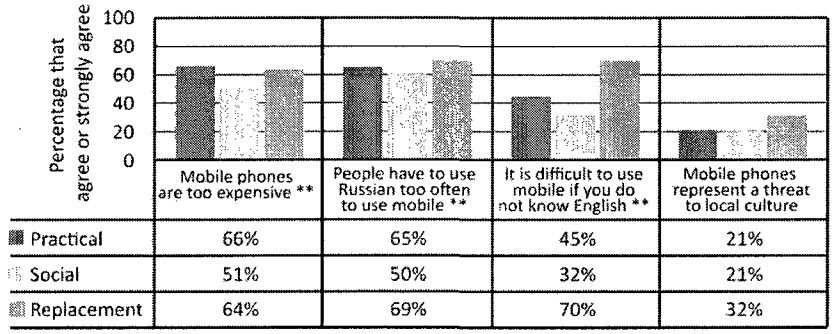
It is important to note that although we are using inferential statistics to analyze the quantitative data (and are careful to control type-one error inflation for each construct), significance for a variable is a fairly high bar to clear. An alpha of 0.05 means that group differences need to be so extreme that they would only happen by chance in fewer than 5% of cases. Additionally, using a Bonferroni adjustment means that, in the univariate follow-up test, the 5% alpha is distributed among *all* the variables in the construct. Whereas this type of rigor is important in evaluating experimental data, personas are ultimately descriptive tools. Consequently, we feel that descriptive data describing group differences that do not reach the bar of statistical significance should, nevertheless, be included in the personas to increase the overall

[101] ** = significant differences found in the MANOVA omnibus test

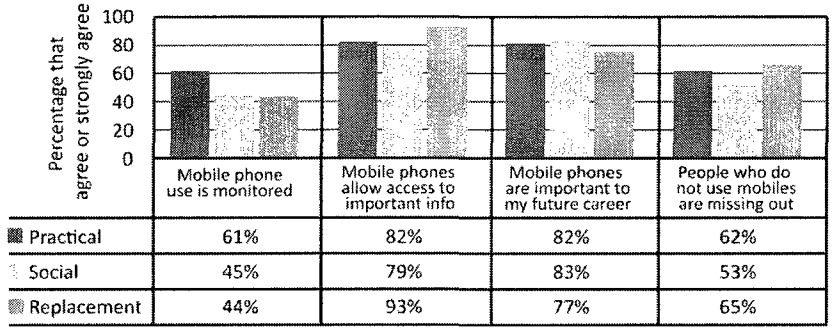
breadth of their descriptions; especially data that follow clear, but non-significant trends. For example, see Employment Status in Figure 112.

A.3.2.5: Construct Two: Mobile phone attitudes, behaviors, and experiences

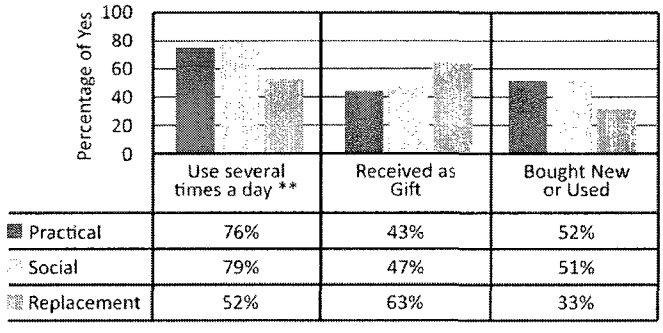
The groups differed on the best linear combination of the 22 mobile use outcomes, Wilks'$\Lambda = 0.665$, $F_{(44, 378)} = 2.95$, $p < 0.05$, $\eta 2 = 0.185$, meaning that approximately 19% of the variance is accounted for by mobile phone attitudes, behavior, and experience group differences. The variables in the mobile phone construct accounted for almost three times the variance in group differences when compared to the demographic construct. This was a validation of the segmentation model; in other words, the groups differed more on their mobile phone attitudes and usage than they differed on demographics. Follow-up pair-wise comparisons, using a Bonferroni adjustment, showed that groups differed significantly on five of the 22 variables in Construct Two, as shown in Figure 113.



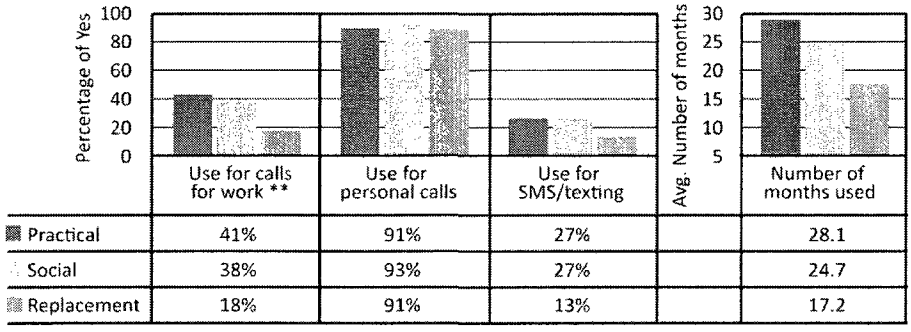
	Mobile phones are too expensive **	People have to use Russian too often to use mobile **	It is difficult to use mobile if you do not know English **	Mobile phones represent a threat to local culture
Practical	66%	65%	45%	21%
Social	51%	50%	32%	21%
Replacement	64%	69%	70%	32%



	Mobile phone use is monitored	Mobile phones allow access to important info	Mobile phones are important to my future career	People who do not use mobiles are missing out
Practical	61%	82%	82%	62%
Social	45%	79%	83%	53%
Replacement	44%	93%	77%	65%



	Use several times a day **	Received as Gift	Bought New or Used
Practical	76%	43%	52%
Social	79%	47%	51%
Replacement	52%	63%	33%



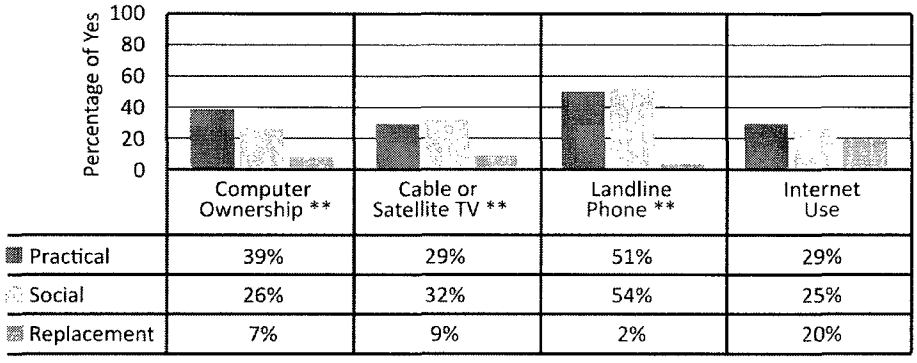
	Use for calls for work **	Use for personal calls	Use for SMS/texting		Number of months used
Practical	41%	91%	27%		28.1
Social	38%	93%	27%		24.7
Replacement	18%	91%	13%		17.2

Figure 113: Construct Two: notable differences attitudes, behaviors & experience[102]

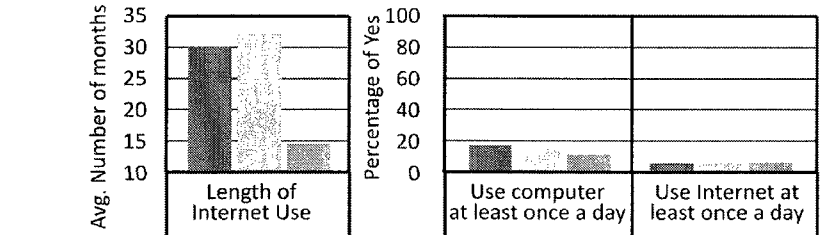
[102] ** = significant differences found in the MANOVA omnibus test

A.3.2.6: Construct Three: Other technology.

We created the technology construct because it is commonly advised to include computer, Internet, and other technology usage in persona development, if the product is technologically based (Mulder & Yaar, 2007). Items for the last construct were analyzed using univariate ANOVA and Chi-square tests, with a Bonferroni-adjusted alpha for each variable in the construct (0.05/7 variables = adjusted alpha of 0.007). Computer ownership, having a landline phone, and cable/satellite TV were all significantly different among the three persona groups. Figure 114 shows computer and Internet use details that were not significantly different, but that were incorporated in the final personas. Many of these details show interesting trends among the three user groups, such as Internet use and length of Internet use.



	Computer Ownership **	Cable or Satellite TV **	Landline Phone **	Internet Use
Practical	39%	29%	51%	29%
Social	26%	32%	54%	25%
Replacement	7%	9%	2%	20%



	Length of Internet Use		Use computer at least once a day	Use Internet at least once a day
Practical	29.9		17%	5%
Social	32.9		16%	5%
Replacement	14.2		11%	6%

Figure 114: Construct Three: Notable differences in other technology use[103]

[103] ** = significant differences found in Chi-square tests

In sum, the segmentation model provided a lens through which we evaluated the multiple variables in the survey and provided an interesting depiction of mobile users in Kyrgyzstan. Our steps were to: (a) find a meaningful segmentation model that would reflect how users would utilize the MoSoSo directory, namely their motivation (goal) to acquire a mobile phone; and (b) investigate whether our initial segments demonstrated significant differences in three constructs that were important for persona creation that might affect how, when, or if individual respondents would use the MoSoSo directory. To encapsulate this data into a set of memorable personas, we needed more than simple statistical differences. We needed realistic back stories and scenarios based on peoples' experiences that would illustrate user requirements. To create these stories, we turned to focus group and interview data.

A.3.2.7: Persona Segmentation of the Interview Participants.

We segmented the 12 interview participants into the three established user groups, based on their descriptions of: (a) telephone use, both land lines and mobile phone, and (b) how they used their mobile phone and other technology in their lives. See Table 53 for interview identifications and descriptions. In the next section, we describe how the interview data was integrated and used for the final persona and scenario creation.

Table 53: Interview Participants by Motivation Group.

Interview ID	Location	Participants	Roles	Primary motivation
KG_UF1	Bishkek	Urban Family	Father (KG_UF1_F1)	Practical
			Youngest son (KG_UF1_S2)	Social
KG_UY1	Bishkek	Urban Youth	Female Friend 1 (KG_UY1_F1)	Social
			Female Friend 2 (KG_UY1_F2)	Social
			Male Friend 1 (KG_UY1_F3)	Social
KG_RF1	Kara Balta	Rural Family	Father (KG_RF1_1)	Practical
			Mother (KG_RF1_2)	Did not own a mobile phone
			Younger brother (KG_RF1_3)	Practical/Social
KG_RY1	Kara Balta	Rural Youth	Male Friend 1 (KG_RY1_1)	Social
			Male Friend 2 (KG_RY1_2)	Practical/Social
			Female Friend 1 (KG_RY1_3)	Social

A.3.3: Persona creation (step 3): literature suggestions

The literature suggests a few basic guidelines on persona content. The guidelines include the use of a non-posed photo (Mulder & Yaar, 2007; Pruitt & Adlin, 2006), a personal name beginning with the first letter of the segmentation group name, a biographical profile, and personal information that affects usage patterns in relation to the product (Pruitt & Adlin, 2006). Additionally, it is commonly advised to include computer, Internet, and other technology usage, if the product is technologically based (Mulder & Yaar, 2007). Finally, user goals for the product are considered critical (Cooper et al., 2007).

Personas are presented through many mediums, including posters and 8½x11" sheets of paper (Pruitt & Adlin, 2006). Others have experimented with more interesting

mediums, such as employing action figures (Nieters, Ivaturi, & Ahmed, 2007), creating living spaces in which the design team interacts in the same types of physical spaces as the personas (Goodwin, 2006), and placing a summary persona on reference cards (Pruitt & Adlin, 2006). Pruitt and Grudin (2003) suggest creating a "foundation document" that explicitly links the final personas to the supporting data that emphasize their connection to the underlying empirical research.

Recall that context scenarios are intended as a simulation of the persona interacting with the product that focuses on usage patterns and persona goals in a specific context. To write context scenarios, the writer is instructed to imagine that the system is 'magic' and to describe interaction that is "broad and shallow" (A. Cooper, et al., 2007). According to Mulder and Yaar (2007), scenarios document a persona's journey through the product interaction by setting the scene, establishing a goal or conflict, and achieving resolution by using the proposed product or service. An effective context scenario needs to contain (a) actors (i.e. personas); (b) setting and background information which includes assumptions about the actors and detail about their environment; (c) the actor's goals or objectives; and (d) a sequence of action and events that follow a plot (Carroll, 2000a; Mulder & Yaar, 2007). Suggested presentations for context scenarios include textual narratives, storyboards, and videos (Mulder & Yaar, 2007).

A.3.4: Persona creation (step 3): what we did

We followed the suggestions in the literature as closely as possible to create our personas and context scenarios. We used photos from interview participants and gave our personas Kyrgyz names, with the first letter matching the first letter of the segment group. The culturally appropriate names also clearly identify the personas as representatives of a non-Western audience. We used our interview data for the biographical and personal content and the survey data to identify technology usage patterns. Identifying user goals, however, was more difficult. Because we were unable

to travel to Kyrgyzstan to re-interview participants about their goals for a MoSoSo service, we inferred goals from our existing data.

To make these inferences, we examined respondents' answers to focus group and interview questions. One question, in particular, asked participants to describe a recent task that was hard to complete. The responses provided data that elaborated on challenges participants had experienced completing everyday tasks. On the basis of these stories, we imagined how the MoSoSo directory could have been part of a solution to their problems. For our final scenarios, we also included details from individual participant interviews in which participants described their experiences from the previous day.

We designed the persona presentation for an 8½x11" sheet of paper. Additionally, we created a detail sheet for each persona that tied each data point for the persona to the specific data from which it was extracted. This detail sheet was a simplified stand-in for the "foundation document" discussed above (Pruitt & Grudin, 2003). We present our context scenarios here as numbered sequences suggested by Cooper et.al (2007).

A.4: Results: User requirements, personas & scenarios

Our resulting three personas were: Parxat, the practical user, Shirin, the social user, and Roza, the replacement user. Each of the one-page persona presentations included: (a) a photo that looks like a real person, not a model (Mulder & Yaar, 2007; Pruitt & Adlin, 2006); (b) key differentiators (Mulder & Yarr, 2007), (c) personal information formatted as a bullet list (Mulder & Yarr, 2007), (d) computer and Internet usage that characterizes the technical abilities of each persona and illustrates significant behavior patterns (Mulder & Yarr, 2007; Cooper & Reimann, 2003), (e) a personal profile written in prose (Mulder & Yarr, 2007; Pruitt & Adlin, 2006), and (f) user goals for the product that emphasize end goals (Mulder & Yarr, 2007; Pruitt & Adlin, 2006). We also encapsulated several critical user requirements for the MoSoSo directory in the context scenarios.

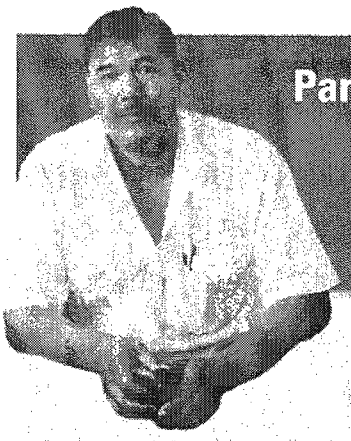
A.4.1:User requirements reflected in the context scenarios

We identified six key user requirements for the MoSoSo directory that allowed individuals to: (a) add/edit business entries in a public directory via SMS/text, (b) create and join private group directories that are shared by family or friends to support social networks via SMS/text, (c) broadcast (push) or post (pull) information within their private shared group directories via SMS/text, (d) contribute and rate services in both the public directory and in private shared directories via SMS/text, (e) retrieve recommendations or information from the public directory and from shared private directories via SMS/text, and (f) retrieve information from the service without using SMS/text. Each scenario highlights specific user requirements as suggested in the literature (Cooper et al., 2007)

A.4.1.1: Practical Parxat

Parxat's background story of being a computer game club owner is largely based on that of interview participant KG_RY1_2 who, at the time of the interview, was a 25-year-old computer game club owner. Since the persona segment represented 55% of the survey respondents, we identified him as the primary persona whose goals and needs are the most important for the MoSoSo directory to meet, see Figure 115 and Figure 116. In the next sections we outline Parxat's key characteristics (section A.4.1.1a), and present his context scenarios (section A.4.1.1b).

A.4.1.1a: Practical Parxat's key characteristics: We identified three defining characteristics for the Parxat persona: (a) he uses his phone for work calls, reflecting the fact that 41% of practical users in the survey data use their phone for work, a rate higher than that of any other group; (2) he purchased his phone, reflecting the practical group's greater likelihood—more so than our other two groups—to have bought their phones; and (c) he is more tech savvy than the other two personas, based on the higher likelihood of his owning a computer. We made Parxat a little bit older than the mean age for the practical group (35.9 years) to emphasize the difference with the social group. All other personal data were based on survey data.



Parxat Practical

Primary Motivation to acquire phone:
I got my mobile phone to make calls when I am away from work or home

Associated motivations:
I got a good price on my phone and mobile phones are cheaper than landlines

Personal Profile

"Mobile phones are part of your communications its like eyes and ears"

For Parxat, mobile phones have provided a key way to stay in contact with work, family and friends.

He owns and manages a small computer game club with eight computers. His club does not yet have internet or a landline; however, he would like to add the internet and more computers when he can afford them.

Currently, Parxat maintains all of the computers but knows he may need help with some computer problems in the future. Other club owners that he has known have had to shut down after two to three years because the equipment has broken down and the owners cannot get the old equipment fixed or afford new. Right now he is not sure who he would ask for help if one of his computers needed maintenance that he could not perform himself.

Parxat has always relied heavily on a system of personal recommendations when looking for professional services. He feels that one should *"trust the advice of friends because they are to be trusted."*

Parxat's Goals for MoSoSo Directory

- Would seek recommendations for professional help such as plumbers and computer maintenance
- Would like to create a public recommendation for his computer club
- Groups he would join or create
  - Family
  - Clients from his computer club
  - Friends through work

Key Significant Differences

Uses the phone for work calls
Bought his mobile phone (not a gift)
Tech savvy compared to other groups

Personal Information

Age: 43 years
Profession: Owns and manages computer game club with eight computers
Lives: In the capital city of Bishkek
Home Life: Lives with his wife and two sons
Russian: Can speak and read fluently
Primary Home Language: Kyrgyz
Primary Work Language: Russian
Schooling: He has a degree in economics focused on finance and credit from Kyrgyzstan Slavonic University
Income: 5200 soms a month (approx $140.00)

Technical Information

Internet Use: Yes, at least occasionally
- **Length of use:** 36 months
- **Use how often:** 1-2 days a week
- **Where use:** Most often at a friend's internet cafe

Computer User: Yes
- **How often:** Several times a day at work

Cable or Satellite TV: Yes
Home Landline: Yes

Mobile Phone Use

Length of use: 28 months
How acquired: Bought his phone new
Use how often: Usually a few times a day
For: 60% personal calls, 40% work calls
SMS: Yes: 70% voice, 30% text
Feelings and concerns:
- Concerned that mobile phone activity is monitored
- Would miss his phone very much if he did not have it (rated 4 on a scale of 1-4)
- Feels mobile phone access is too expensive

Primary persona: represents 55% of survey respondents who own mobile phones

1

Figure 115: Parxat persona

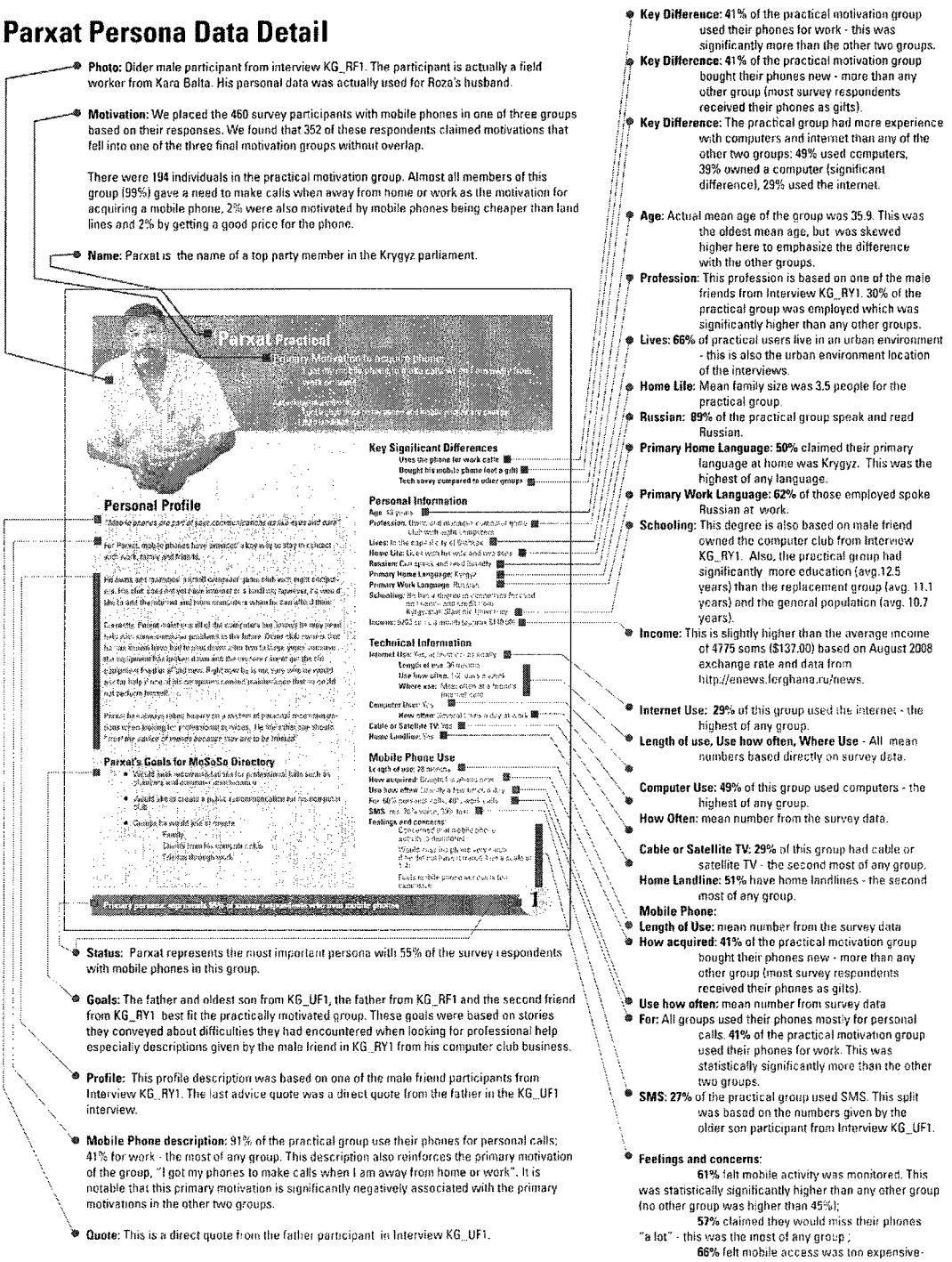


Figure 116: Parxat persona data detail

Parxat's technical information and mobile phone use was mostly based on survey findings. We found, however, that our interview participants were more likely to use text messaging than the 27% rate of use extrapolated from the survey. Since the MoSoSo service needs some text interfacing, we exaggerated Parxat's texting ability to align it with the reported text use of interview participant (KG_UF1_S1), whom we had situated in the practical segment.

The quotes attributed to Parxat's persona are lifted directly from the interview participants and emphasize his strong reliance on friends. Parxat's goals for the MoSoSo directory, as a small business owner, are inferred from the interviews.

A.4.1.1b: Practical Parxat's context scenario: For Parxat's primary context scenario we focused on two user requirements: (a) requirement 1 - allowing users to add a business to the public directory and (b) requirement 4 - allowing users to rate a business in both the public directory and a shared private directory.

1. When Parxat arrives at his small computer club in the morning, he sees a flyer advertising the MoSoSo directory. The flyer explains that as a small business owner he can add his business to a public information space where users can vote to recommend shops and services.

2. Parxat calls the service and discovers that listing a service requires using text.

3. Navigating the service through a series of text messages, he decides to locate his shop under a category called "Computer cafe/club." The entry system allows Parxat to set up two types of advertisements, one for users who utilize text and one for users who do not use text.

4. Later, Parxat asks one of his clients, Ilzat, to call the service and submit a vote. Ilzat already belongs to a private shared directory. Izlat offers to not only give Parxat's shop a good vote in the public directory, but to also add it as a recommended computer club in his private shared directory.

Parxat's secondary scenario is focused on two user requirements: (a) requirement 5- retrieving information or recommendations from the public directory and (b) requirement 2 - allowing users to create and join private shared directories.

1. Parxat's small computer club is doing well; however, he knows he could do better if he had Internet access for his customers.

2. Parxat has never set up a network, and he does not even know where to start. He asks around to his friends, customers, and family if anyone knows someone who can help. No one in his social network has any ideas.

3. Parxat decides to text the MoSoSo directory to find a recommended network technician.

4. While not knowing any of the people who are recommended in the directory, Parxat is skeptical, but he gives a technician, named Dima, a call.

5. Since Dima's business is very new, he wants to do everything he can to get a good recommendation from Parxat.

6. One month later, Parxat has an Internet connection in his club, Dima has a recommendation from Parxat in the public directory, and Parxat and Dima start their own private shared directory for computer and Internet club owners.

A.4.1.2: Social Shirin

The context scenario for the social user came from male participant KG_UF1_S2, who conveyed his experience in a student group where he functioned as both a member and organizer. Shirin was also identified as a primary persona because her segment represents 32% of the survey respondents, see Figure 117 and Figure 118. In the next sections we outline Shirins's key characteristics (section A.4.2.1a), and present his context scenarios (section A.4.2.1b).

A.4.1.2a: Social Shirin's key characteristics: We identified three key characteristics for Shirin: (a) she uses her phone to primarily call friends, emphasizing the fact that 93% of social group members use their phones for social calls; (b) she is

the least likely to feel that mobile access is too expensive, reflecting the fact that only 50% of the social group felt that mobile phone use was too expensive (significantly less than the other two groups); and (c) she is somewhat tech savvy, reflecting our finding that the social group had the second highest level of experience with computers and the Internet. We made Shirin a little younger than the mean age for the social group (33.6 years) to emphasize the group's difference from the practical group. All other personal data were based on survey findings.

Like Parxat, we also exaggerated Shirin's texting enthusiasm and based her texting rate on interview participant KG_RY1_1, whom we had placed in the social segment. The quotes in Shirin's persona are directly from interview participants who we had located in the social group and focus on social aspects of her life. Shirin's goals for the MoSoSo directory, like those of Parxat, are inferred from the interviews.

A.4.1.2b: Social Shirin's context scenario. For Shirin's primary scenario, we focused on (a) requirement 2 - allowing users to create and join private shared directories (to support social networks) and (b) requirement 3 - allowing users to broadcast (push) or post (pull) messages to members of the shared private directory.

1. As a cofounder of an unregistered student organization, Shirin is always trying to find ways to recruit new members on campus and let existing members know about upcoming events and meetings.

2. After hearing about the MoSoSo directory, she decides to set up a private shared directory for her student organization using SMS/text.

3. She also wants to set up the directory so that users can get notices in several different ways. They can (1) call in for new information, (2) ask for a text alert when there is new information and then call in, or (3) sign up for text broadcasts.

4. A few days later, once the shared directory has been set up, she sends out a new message about an upcoming meeting for group members using SMS/text.



Shirin Social

Primary Motivation to acquire phone:
I like people to reach me at all times

Associated motivations:
My friends all have mobile phones

Key Significant Differences

Uses the phone to primarily to call friends

Least likely to feel mobile access is too expensive

Somewhat tech savvy

Personal Profile

"We just talk to our friends....things like did you hear that this or that happened - in our communication rumors are the official news, and gossip works"

For Shirin, keeping in contact with friends is the most important thing about mobile phones.

She is a full time student (junior) at American University of Central Asia (AUCA), studying business administration. She also works part time as a bartender in a cafe .

Shirin is part of an unregistered student association at school that organizes cultural and historical meetings at a local cafe. She also enjoys arranging parties for her friends.

She is interested in social networking applications on the internet, but has found it boring, stating" *the first time is interesting then you get bored because you already know everybody."*

Shirin's Goals for MoSoSo Directory

- Would use the service most to create groups of friends
- Would like to broadcast messages to particular groups or to tell people where there will be social gatherings
- Would like to retrieve messages from other members of a group
- Groups she would join or create
  - Family
  - Friends from work and school
  - Associations through her unregistered student organization

Personal Information

Age: 20 years

Profession: Student and works part time as a bartender in a local cafe

Lives: In the capital city of Bishkek

Home Life: Lives with her dad and an older brother. She also has around 30 cousins in towns.

Russian: Can speak and read fluently

Primary Home Language: Kyrgyz

Primary Work Language: Kyrgyz

Schooling: She is a full time student (junior) at the American University of Central Asia studying business administration

Income: 2000 soms a month (approx $55.00)

Technical Information

Internet Use: Yes, at least occasionally

- **Length of use:** 33 months
- **Use how often:** About once a week
- **Where use:** Most often at an internet cafe

Computer User : Yes

- **How often:** A few times a week at school

Cable or Satellite TV: Yes

Home Landline: Yes

Mobile Phone Use

Length of use: 25 months

How acquired: Was given the phone by a cousin

Use how often: Several times a day

For: 80% personal calls, 20% work calls

SMS: Yes: 65% voice, 35% text

Feelings and concerns:

- The least likely of any group to feel that mobile phones are too expensive
- Feels that mobile phones are important to her future career

Primary persona: represents 32% of survey respondents who own mobile phones

2

Figure 117: Social Shirin's persona

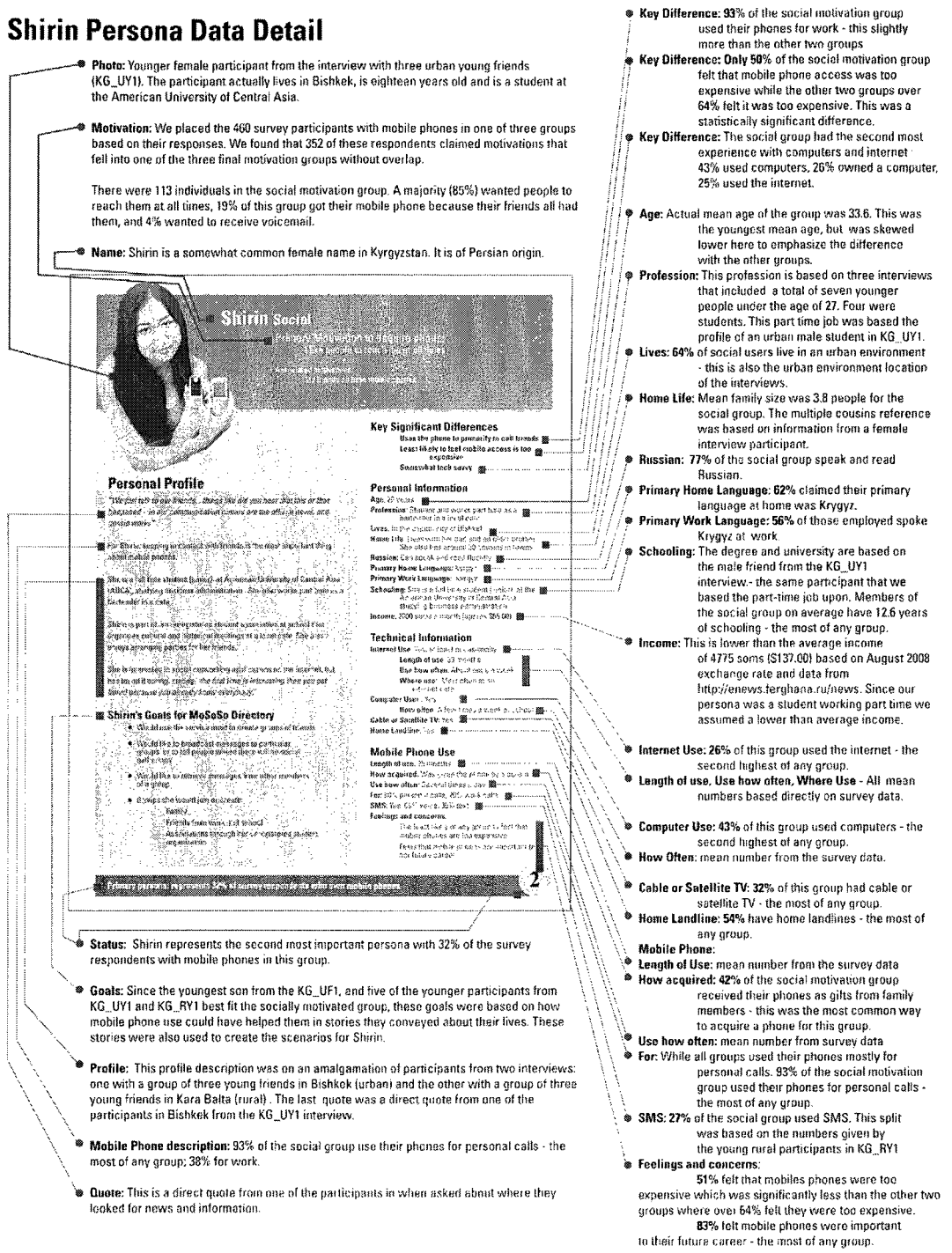


Figure 118: Social Shirin's persona data detail

For Shirin's second scenario, we focused on user requirement 3 - allow users to broadcast (push) or post (pull) messages to a private shared directory. While this scenario is not specifically related to providing directory information services, it does build out functionality related to the social networking components of the system.

1. Shirin's boyfriend, Talik, works at the same cafe she does.

2. It is common for the workers from their cafe to challenge workers from other cafes to battle on a paintball course.

3. Talik enjoys organizing these events and has set up a MoSoSo shared directory to assist his organizational efforts. Everyone in the group has agreed to accept broadcast messages.

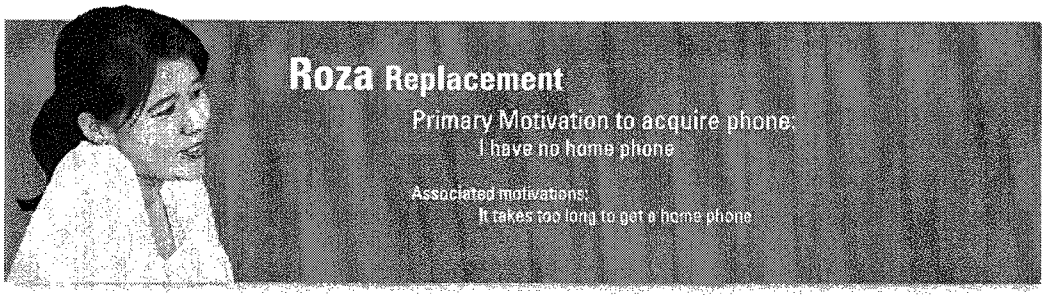
4. On Saturday, their cafe is supposed to fight a local cafe; each agrees to recruit ten workers.

5. However, when Saturday comes around, only seven workers show up. His cafe will have to forfeit if they cannot recruit ten people.

6. Talik broadcasts a message to all group members who are part of the shared private directory; he discovers that several people in the group forgot about the event and that his broadcast reminded them. Consequently, the cafe is able to challenge the rival cafe on the paintball course.

A.4.1.3: Replacement Roza

Roza's biographical background was derived primarily from an interview with suburban family members (KG_RF1). The father's brother lived in a village where the one landline was housed in a community building that closed at 5:00 p.m, see Figure 119 and Figure 120. Because Roza's persona segment only represents 13% of survey respondents, we identified her as a secondary persona whose goals and needs are less of a driving force in the design of the MoSoSo directory than those of the other two personas.



Personal Profile

"There are only so many services provided, but not enough for middle class people... it would be nice if there was the one server that gave the information about everything that was needed for marshukas (buses) and other things."

For Roza, who does not have a landline at home, a mobile phone is a very important device that allows her to stay in contact with her friends and family; however, she would like to see more affordable mobile phone services for "middle class" people like her.

There is only one landline in a community building in her village that closes at 5 PM every day.

While Roza herself is not tech savvy, she does not use the internet or computers. However, she recognizes the importance of technology for her daughters, and would like to have a computer at home while they are in school.

Roza and her husband rely on their friends and family to find specialist to complete services they need. Recently, she needed to find a mechanic and used her social network, stating *"...it's better to find someone through your friends."*

Roza's Goals for MoSoSo Directory

- Would be more likely to seek a recommendation for services than to make one
- Would want to access the service without using text
- Would like to find recommendations for professional services from other members of a group
- Groups she would join
  - Family
  - Neighbors
  - May look in the public area for professional services

Key Significant Differences

Least likely to use the phone for work
Lives in a rural area
Not tech savvy

Personal Information

Age: 35 years
Profession: Housewife - her husband is a driver for an agricultural corporation (for 23 years)
Lives: In Ceragulak, a rural village
Home Life: Lives with her husband, son and two daughters
Russian: Can speak and read Russian
Primary Home Language: Kyrgyz
Primary (Husband's)Work Language: Kyrgyz
Schooling: Completed secondary school
Income: (Husband's income) 4200 soms a month (approx $110.00)

Technical Information

Internet Use?: No
Computer User? : No, but she would like to get a computer for her two daughters who are still in school
Cable or Satellite TV: No
Home Landline: No

Mobile Phone Use

Length of use: 17 months
How acquired: Was given the phone by her brother
Use how often: Three to five days a week
For: Primarily for personal calls
SMS: No, but has considered it
Feelings and concerns:
- She feels it is difficult to use a mobile phone when you do not know English
- She is concerned that mobile phones represent a threat to local culture and ways
- She feels strongly that mobile phones allow her access to important and relevant information

Secondary persona: represents 13% of survey respondents who own mobile phones 3

Figure 119: Replacement Roza's persona

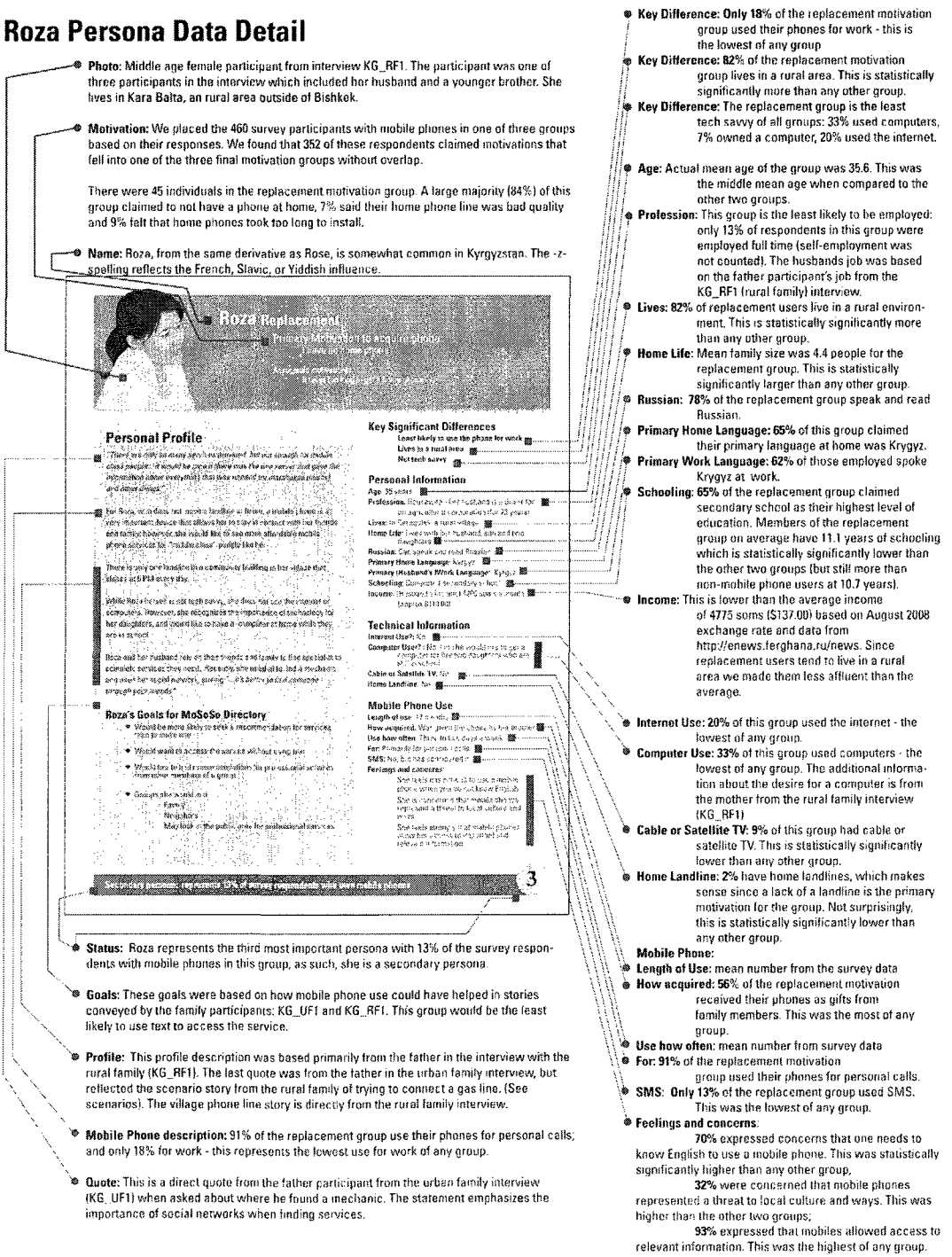


Figure 120: Replacement Roza's persona data detail

A.4.1.3a: Replacement Roza's key characteristics: We identified three key characteristics for Roza: (a) she is the least likely to use her phone for work; (2) she lives in a rural area, reflecting survey results that indicate 82% of the replacement group lived in a rural area; and (3) she is not tech savvy, which reflects our finding that the replacement group was the least tech savvy. Roza's remaining personal data were based on survey findings for her segment.

As with the previous two participants, Roza's technical information and mobile phone use were based on survey findings. Since none of our interview participants fit in the replacement group, Roza's quotes are from interview participant KG_UF1_F1, who emphasized the importance of social networks (rather than technologies) when finding services.

A.4.1.3a: Replacement Roza's context scenario. Roza's context scenario came from urban father participant KG_UF1_F1, who described his recent difficulty in finding a mechanic. Roza's scenario focuses on one specific user requirement: allow users to retrieve information from the service without using SMS/text.

1. When Roza's husband, Ermek, left for work this morning, he discovered that their car would not start. He called a co-worker who luckily was able to pick up Ermek on his way to the local farm where they both work. Ermek asked Roza to find a mechanic to fix the car as soon as possible.

2. Trusting her social network for answers, Roza begins to call friends and family to see if anyone knows of a good mechanic with experience fixing their make and model of car.

3. Her sister-in-law suggests that Roza call the general information line. This suggestion frustrates Roza because it can take several hours to get through the information line and then she will have no idea if the mechanic will be up to the task of fixing her car.

4. Rather than calling the information line right away, Roza calls a neighbor who tells her about the MoSoSo directory and gives Roza a password for a shared group directory that many in her neighborhood are part of.

5. Since Roza does not use text messaging, Roza is pleased to find she can interact using only her keypad by answering questions that guide her to a list of locally recommended mechanics.

6. After navigating her way through the phone tree, Roza finds a mechanic whom the neighborhood group recommends.

A.4.1.3: Summary

Each of these context scenarios illustrates particular user requirements of the MoSoSo directory, based on real stories about difficulties users encountered in their lives, the importance of social networks, and how the MoSoSo service might support those existing networks and solve a problem. The personas amalgamate multiple sources of data to provide an idea of who the users are, and the scenarios describe a particular interaction with the proposed service. Together, the personas and scenarios roll up complex data from multiple sources into communication conduits that design teams can use to understand end users.

A.5: Discussion

The case study presented here discusses how we used existing qualitative and quantitative data to create personas and scenarios that identify user requirements and communicate user needs. The data were not collected in relation to a specific product or service. However, after the product idea of a MoSoSo directory was generated, we revisited the existing data to help create UCD deliverables. We began by segmenting the audience through statistical analysis of survey questions and identified three groups that were differentiated by their motivation to acquire a mobile phone: practical, social, and replacement. We then analyzed the survey data for additional differences among the three groups. The differences reflected in the final personas were based on three constructs: (a) demographics, (b) attitudes about mobile phones and mobile phone usage, and (c) other technology experience. Whereas quantitative datasets were useful

for user segmentation, the richer qualitative data were needed to create personal profiles and scenarios.

Once each interview participant was placed in the appropriate segment, the interview information was used to fill in biographical stories. The resulting persona information was amalgamated into a single sheet for each persona to provide a memorable image of end users. The scenarios presented here were based on real-life stories in response to interview questions about difficulties the participants had encountered. For each context scenario, we inferred how the MoSoSo directory could help the participants navigate those difficulties, and we focused on specific user requirements.

Because design research for diverse populations, including developing regions, is expensive and demands significant resources and expertise, we argue that using existing data sources can reduce costs while still representing the user needs of these populations. Designing for diverse populations is crucial for both development and economic reasons. Whereas on-the- ground studies are irreplaceable as data sources, other approaches are needed if design is to address increasingly diverse users. User researchers and designers can make significant headway toward creating appropriate designs by extracting user requirements from existing data sources.

Additionally, we demonstrate that personas and scenarios make compelling communication summations of user research that help define user requirements. Because there is little information about how to create personas and scenarios using existing data, the methods presented here will help researchers (a) create effective conduits of user research (personas and scenarios) that capture and communicate user requirements to design teams, and (b) allow a broader range of designers, including those in workplaces that lack financial resources and/or cultural expertise, to make use of such approaches to develop creative and appropriate technologies for diverse users.

Acknowledgments

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Appendix B: Screening survey

Introduction
This survey is focused on investigating how design/development teams leverage user experience research to create user-centered technology products or services.

The survey should take no more than 10 minutes to complete.

We are offering a $5.00 Amazon.com gift certificate to the first 100 respondents who meet the two requirements listed below and complete the survey. In addtion, we may contact you for a follow up study. These will require you to enter your name and email address.

Submitting your contact information is NOT a requirement to participate in the survey. However, your survey information will be confidential IF you do submit your contact information.

You can withdraw from the study at any time by closing your browser window. Participating in this study should cause no more discomfort than reading any general information you might find on the Web and answering questions about it.
Use the next and previous buttons provided in the survey interface since the back and next buttons in your browser may not allow the survey tools to save your results.

Requirements for completing this survey:
(1) you must be 18 years of age or older
(2) you must be professionally involved in the creation or evaluation of software technology. This can include websites, mobile phone interfaces, computer games, software for the personal computer...etc.
If you have any questions, concerns or suggestions, feel free to contact us through Cynthia Putnam at cyputnam@u.washington.edu. Thank you for your contribution to this research.

Are you 18 years of age or older?
Required.

- Yes
- No

Have you ever contributed professionally to the creation of software technology (e.g. websites, mobile interfaces, computer or mobile games, software, etc.)?
Required.

- Yes
- No

How many years of professional experience do you have creating software technology?

Note: This could include many types of projects or job responsibilities for example, 2 years of visual design for software and 2 years of information architecture for websites = 4 years total.

- 0 to less than 1 year
- 1 year to less than 2 years
- 2 years to less than 3 years
- 3 years to less than 5 years
- 5 years to less than 7 years
- 7 years to less than 10 years
- Over 10 years

What job title best describes your current or most recent responsibilities when creating software technology?

- Designer
- Information architect
- Interaction designer
- Developer
- Writer
- Accessibility specialist
- Project manager
- Usability specialist
- User experience architect
- User researcher
- Other:

How many years have you been performing (or did perform) the responsibilities of the job above?

- 0 to less than 1 year
- 1 year to less than 2 years
- 2 years to less than 3 years
- 3 years to less than 5 years
- 5 years to less than 7 years
- 7 years to less than 10 years
- Over 10 years

Please briefly describe your job responsibilities.

Please describe approximately three to five major steps you consider good practice for designing, developing and evaluating a new computer system for users.

Have you ever utilized (been given user research, for example, a description of a user) or conducted user research (done the research yourself) while part of a team creating software technology?
Required.

- No – (Branch to end of survey)
- Yes, I have utilized user research (Branch 1)
- Yes, I have conducted user research (Branch 2)
- Yes, I have both conducted and utilized user research (Branch 3)

Branch 1: Yes, I have utilized user research
Please check what types of user research methods you have conducted, created, and/or utilized.
The list below represents several methods (not an inclusive list) aimed at learning about the user experience, communicating about the user experience and or synthesizing information gathered about the user experience.

- ☐ Contextual Inquiry
- ☐ Heuristic Evaluation
- ☐ Personas
- ☐ Affinity Diagrams
- ☐ Card Sorting
- ☐ Scenarios
- ☐ Ethnographic Observation
- ☐ Cognitive Task Analysis
- ☐ Focus Groups
- ☐ Other:

Please describe your last experience in conducting, creating or utilizing one or more of the methods listed above.

For example, what was the project platform, e.g. mobile phone, web site? How long ago was this experience? Which method did you use? Was it successful? If you were given the research, how was it presented to you, e.g in a report, as personas? If you conducted the research, how did you communicate about that research? Did you both conduct the research and use the research?...etc

Branch 2: Yes, I have conducted user research
Please check what types of user research methods you have conducted, created, and/or utilized.
The list below represents several methods (not an inclusive list) aimed at learning about the user experience, communicating about the user experience and or synthesizing information gathered about the user experience.

- ☐ Contextual Inquiry
- ☐ Heuristic Evaluation
- ☐ Personas
- ☐ Affinity Diagrams
- ☐ Card Sorting
- ☐ Scenarios
- ☐ Ethnographic Observation
- ☐ Cognitive Task Analysis
- ☐ Focus Groups
- ☐ Other:

Please describe your last experience in conducting, creating or utilizing one or more of the methods listed above.

For example, what was the project platform, e.g. mobile phone, web site? How long ago was this experience? Which method did you use? Was it successful? If you were given the research, how was it presented to you, e.g. in a report, as personas? If you conducted the research, how did you communicate about that research? Did you both conduct the research and use the research?...etc

Branch 3: Yes, I have both conducted and utilized user research
Please check what types of user research methods you have conducted, created, and/or utilized.
The list below represents several methods (not an inclusive list) aimed at learning about the user experience, communicating about the user experience and or synthesizing information gathered about the user experience.

- ☐ Contextual Inquiry
- ☐ Heuristic Evaluation
- ☐ Personas
- ☐ Affinity Diagrams
- ☐ Card Sorting
- ☐ Scenarios
- ☐ Ethnographic Observation
- ☐ Cognitive Task Analysis
- ☐ Focus Groups
- ☐ Other: _____

Please describe your last experience in conducting, creating or utilizing one or more of the methods listed above.

For example, what was the project platform, e.g. mobile phone, web site? How long ago was this experience? Which method did you use? Was it successful? If you were given the research, how was it presented to you, e.g. in a report, as personas? If you conducted the research, how did you communicate about that research? Did you both conduct the research and use the research?...etc

Appendix C: Design study research materials

C.1: Consent Form

Background Information:
I, Cynthia Putnam, have been asked by a research group at the University of Washington to get designer/developer input and feedback for one of their current projects.

Procedures:
If you agree to be in this study, you will be asked to:
- Talk about your job responsibilities and your approach to design/development
- Take a 28 item online survey on a laptop
- Do a task: Detail an interaction design for a telephony project the research group is interested in developing. You will be given multiple types of information that may help you in your design. Additionally, will have access to a laptop with the internet to seek any additional information you would like.
- Talk about your interaction design after you have completed the task
- Discuss how you came to your interaction design solution

You will be audio taped for all portions of the experiment.

Additionally, you will be videotaped as you complete the design task. By signing this form, you give your consent for me to use your voice, verbal statements, and videotaped pictures, but not your name for the purpose of showing the results.

Voluntary Nature of the Study:
Your participation in this study is voluntary. This means that everyone will respect your decision of whether or not you want to be in the study. You will not be treated differently if you decide not to be in the study. If you decide be part of the study now, you can still change your mind later. If you feel stressed during the study you may stop at any time. You may choose to not answer any questions asked.

Risks and Benefits of Being in the Study:
You can choose at any time to opt out or not participate in any part of the study. The only risk you will take from withdrawing is not experiencing the study.

Compensation:
You will be emailed a $75.00 Amazon.com gift certificate within two weeks of the completion of the study.

Confidentiality:
Any information you provide will be kept anonymous, as no names or specifics will be associated this study, now or in the future. I will not use your information for any purposes outside of this research project.

Contacts and Questions:
If you have any questions, you may ask me at any time during the test.

Or if you have questions later, you may contact me at cyputnam@u.washington.edu. Or you can speak to my advisor Jennifer Turns by contacting her at jturns@engr.washington.edu.

I will give you a copy of this form to keep.

Your Statement of Consent:

☐ I have read the above information. I have received answers to any questions I have at this time. I am 18 years of age or older, and I consent to participate in the study.

Printed Name of Participant _____

Participant's Signature _____

Researcher's Signature _____

C.2: Task

Task: Design the interaction for user requirements listed for phase 1.

This is for a proposed Mobile Social Software directory system for mobile users in Kyrgyzstan.

User requirements in two phases:

- **Phase 1: Text Interaction**
  - Allow businesses to publicly advertise their information via text (note the system would be seeded with many existing businesses) – and edit or delete their information later.
  - Allow users to create and join shared directories (to support social networks) via text
  - Allow users to contribute and rate businesses in shared directories or in a public directory via text
  - Allow users to retrieve recommendations and business information from shared directories or from a public directory via text
- Phase 2 (do not consider at this point)
  - Allow users to broadcast (push) or post (pull) messages to a shared directory via text
  - Allow users to retrieve information from the service without using text.

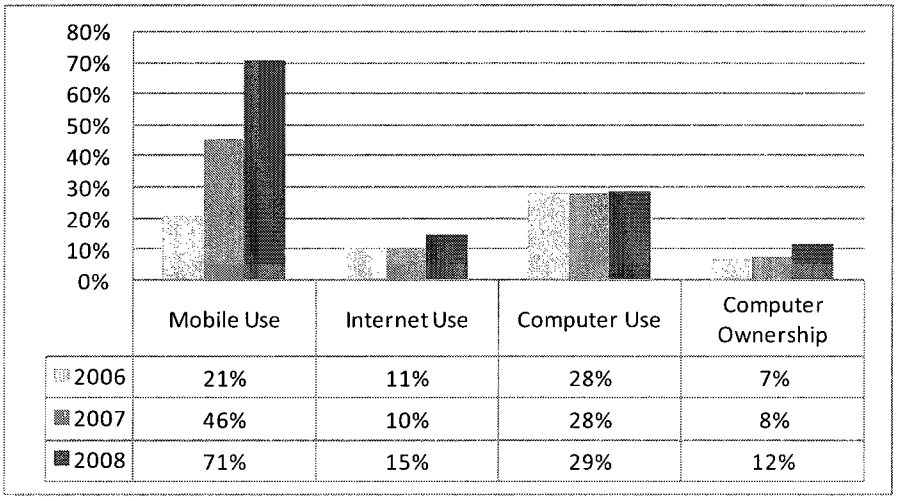
Design Limitations

- Text messages are restricted to 160 characters which include spaces and line breaks. The system may need to return multiple messages.

Key findings that supported this concept:

- (1) A lack of easily accessible, reliable, and free information about phone numbers.
  - A design ethnography revealed that there are no standard yellow pages available in the country. Additionally, while there is a mobile directory available by phone, participants were reluctant to use it because it was for a pay service. While there is a published directory available at bookstores, it is expensive and not perceived as reliable.
- (2) A history of a strong reliance on social networks to accomplish tasks in everyday life.
  - The reliance of a face-to-face social network is a key component of daily life in Kyrgyzstan. The importance of close social networks for information, assistance and goods has been a repeated element in the research conducted as part of the Central Asia + Information Communication Technology project and in other investigations focused on Kyrgyzstan.
- (3) Strong upward trend in mobile phone use and ownership.

- Over the three year period of conducting surveys in the region, the study has found a sharp increase in mobile phone use while other technology use has increased only slightly, see Figure 1.



	Mobile Use	Internet Use	Computer Use	Computer Ownership
2006	21%	11%	28%	7%
2007	46%	10%	28%	8%
2008	71%	15%	29%	12%

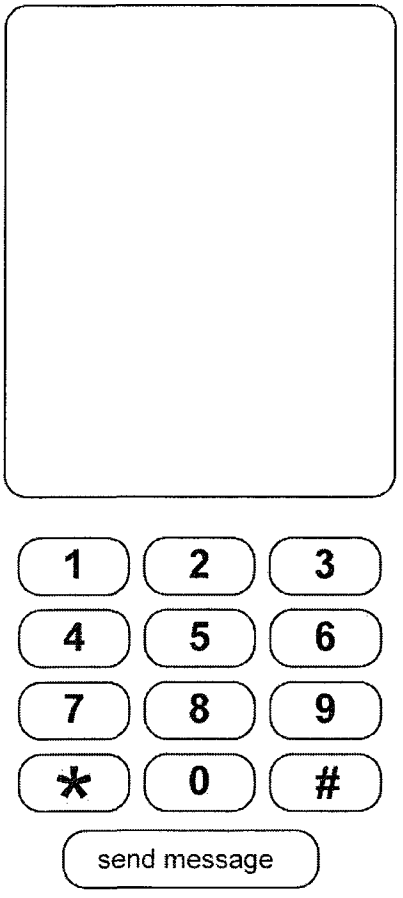
C.3: Telephony information sheet

What is a Telephony system?
Telephony is the technology associated with the electronic transmission of voice, fax, text or other information between distant parties using systems historically associated with the telephone, a handheld device containing both a speaker or transmitter and a receiver. With the arrival of computers and the transmittal of digital information over telephone systems and the use of radio to transmit telephone signals, the distinction between *telephony* and *telecommunication* has become difficult to make.

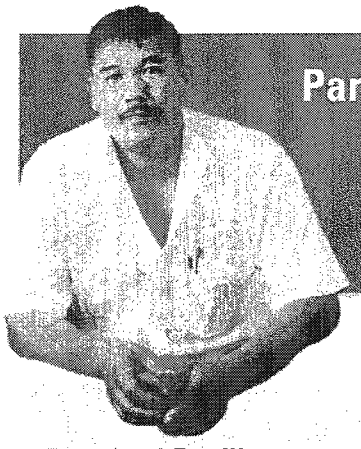
(Definition from:
http://searchunifiedcommunications.techtarget.com/sDefinition/0,,sid186_gci213113,00.html)

The most common way that most people have interacted with telephony systems is through a messaging phone tree. However, many telephony systems are capable of sending and receiving text messages as well.

The user's interface is a phone:



C.4: Personas and context scenarios



Parxat Practical

Primary Motivation to acquire phone:
I got my mobile phone to make calls when I am away from work or home

Associated motivations:
I got a good price on my phone and mobile phones are cheaper than landlines

Personal Profile

"Mobile phones are part of your communications its like eyes and ears"

For Parxat, mobile phones have provided a key way to stay in contact with work, family and friends.

He owns and manages a small computer game club with eight computers. His club does not yet have internet or a landline; however, he would like to add the internet and more computers when he can afford them.

Currently, Parxat maintains all of the computers but knows he may need help with some computer problems in the future. Other club owners that he has known have had to shut down after two to three years because the equipment has broken down and the owners cannot get the old equipment fixed or afford new. Right now he is not sure who he would ask for help if one of his computers needed maintenance that he could not perform himself.

Parxat has always relied heavily on a system of personal recommendations when looking for professional services. He feels that one should *"trust the advice of friends because they are to be trusted."*

Parxat's Goals for MoSoSo Directory

- Would seek recommendations for professional help such as plumbers and computer maintenance
- Would like to create a public recommendation for his computer club
- Groups he would join or create
  - Family
  - Clients from his computer club
  - Friends through work

Key Significant Differences

Uses the phone for work calls
Bought his mobile phone (not a gift)
Tech savvy compared to other groups

Personal Information

Age: 43 years
Profession: Owns and manages computer game club with eight computers
Lives: In the capital city of Bishkek
Home Life: Lives with his wife and two sons
Russian: Can speak and read fluently
Primary Home Language: Kyrgyz
Primary Work Language: Russian
Schooling: He has a degree in economics focused on finance and credit from Kyrgyzstan Slavonic University
Income: 5200 soms a month (approx $140.00)

Technical Information

Internet Use: Yes, at least occasionally
  Length of use: 36 months
  Use how often: 1-2 days a week
  Where use: Most often at a friend's internet cafe
Computer User: Yes
  How often: Several times a day at work
Cable or Satellite TV: Yes
Home Landline: Yes

Mobile Phone Use

Length of use: 28 months
How acquired: Bought his phone new
Use how often: Usually a few times a day
For: 60% personal calls, 40% work calls
SMS: Yes: 70% voice, 30% text
Feelings and concerns:
  Concerned that mobile phone activity is monitored
  Would miss his phone very much if he did not have it (rated 4 on a scale of 1-4)
  Feels mobile phone access is too expensive

Primary persona: represents 55% of survey respondents who own mobile phones

1



Shirin Social

Primary Motivation to acquire phone:
I like people to reach me at all times

Associated motivations:
My friends all have mobile phones

Personal Profile

"We just talk to our friends...things like did you hear that this or that happened - in our communication rumors are the official news, and gossip works"

For Shirin, keeping in contact with friends is the most important thing about mobile phones.

She is a full time student (junior) at American University of Central Asia (AUCA), studying business administration. She also works part time as a bartender in a cafe.

Shirin is part of an unregistered student association at school that organizes cultural and historical meetings at a local cafe. She also enjoys arranging parties for her friends.

She is interested in social networking applications on the internet, but has found it boring, stating" *the first time is interesting then you get bored because you already know everybody.*"

Shirin's Goals for MoSoSo Directory

- Would use the service most to create groups of friends
- Would like to broadcast messages to particular groups or to tell people where there will be social gatherings
- Would like to retrieve messages from other members of a group
- Groups she would join or create
  - Family
  - Friends from work and school
  - Associations through her unregistered student organization

Key Significant Differences

Uses the phone to primarily to call friends

Least likely to feel mobile access is too expensive

Somewhat tech savvy

Personal Information

Age: 20 years

Profession: Student and works part time as a bartender in a local cafe

Lives: In the capital city of Bishkek

Home Life: Lives with her dad and an older brother. She also has around 30 cousins in towns.

Russian: Can speak and read fluently

Primary Home Language: Kyrgyz

Primary Work Language: Kyrgyz

Schooling: She is a full time student (junior) at the American University of Central Asia studying business administration

Income: 2000 soms a month (approx $55.00)

Technical Information

Internet Use: Yes, at least occasionally

- **Length of use**: 33 months
- **Use how often:** About once a week
- **Where use:** Most often at an internet cafe

Computer User : Yes

- **How often:** A few times a week at school

Cable or Satellite TV: Yes

Home Landline: Yes

Mobile Phone Use

Length of use: 25 months

How acquired: Was given the phone by a cousin

Use how often: Several times a day

For: 80% personal calls, 20% work calls

SMS: Yes: 65% voice, 35% text

Feelings and concerns:

- The least likely of any group to feel that mobile phones are too expensive
- Feels that mobile phones are important to her future career

Primary persona: represents 32% of survey respondents who own mobile phones



Roza Replacement

Primary Motivation to acquire phone:
I have no home phone

Associated motivations:
It takes too long to get a home phone

Personal Profile

"There are only so many services provided, but not enough for middle class people... it would be nice if there was the one server that gave the information about everything that was needed for marshukas (buses) and other things."

For Roza, who does not have a landline at home, a mobile phone is a very important device that allows her to stay in contact with her friends and family; however, she would like to see more affordable mobile phone services for "middle class" people like her.

There is only one landline in a community building in her village that closes at 5 PM every day.

While Roza herself is not tech savvy; she does not use the internet or computers. However, she recognizes the importance of technology for her daughters, and would like to have a computer at home while they are in school.

Roza and her husband rely on their friends and family to find specialist to complete services they need. Recently, she needed to find a mechanic and used her social network, stating *"...it's better to find someone through your friends."*

Roza's Goals for MoSoSo Directory

- Would be more likely to seek a recommendation for services than to make one
- Would want to access the service without using text
- Would like to find recommendations for professional services from other members of a group
- Groups she would join
  - Family
  - Neighbors
  - May look in the public area for professional services

Key Significant Differences

Least likely to use the phone for work
Lives in a rural area
Not tech savvy

Personal Information

Age: 35 years
Profession: Housewife - her husband is a driver for an agricultural corporation (for 23 years)
Lives: In Ceragulak, a rural village
Home Life: Lives with her husband, son and two daughters
Russian: Can speak and read Russian
Primary Home Language: Kyrgyz
Primary (Husband's)Work Language: Kyrgyz
Schooling: Completed secondary school
Income: (Husband's income) 4200 soms a month (approx $110.00)

Technical Information

Internet Use?: No
Computer User? : No, but she would like to get a computer for her two daughters who are still in school
Cable or Satellite TV: No
Home Landline: No

Mobile Phone Use

Length of use: 17 months
How acquired: Was given the phone by her brother
Use how often: Three to five days a week
For: Primarily for personal calls
SMS: No, but has considered it
Feelings and concerns:

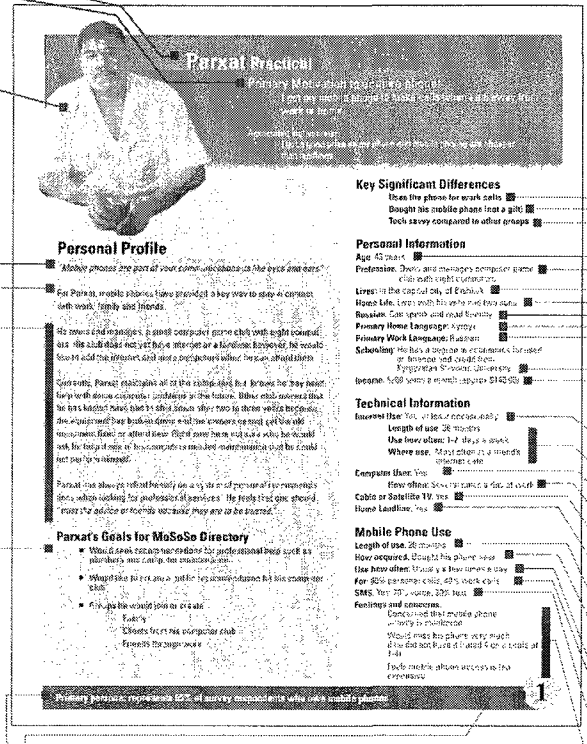
She feels it is difficult to use a mobile phone when you do not know English

She is concerned that mobile phones represent a threat to local culture and ways

She feels strongly that mobile phones allow her access to important and relevant information

Secondary persona: represents 13% of survey respondents who own mobile phones

Parxat Persona Data Detail



- **Photo:** Older male participant from interview KG_RF1. The participant is actually a field worker from Kara Balta. His personal data was actually used for Roza's husband.
- **Motivation:** We placed the 460 survey participants with mobile phones in one of three groups based on their responses. We found that 352 of these respondents claimed motivations that fell into one of the three final motivation groups without overlap.

  There were 194 individuals in the practical motivation group. Almost all members of this group (99%) gave a need to make calls when away from home or work as the motivation for acquiring a mobile phone, 2% were also motivated by mobile phones being cheaper than land lines and 2% by getting a good price for the phone.
- **Name:** Parxat is the name of a top party member in the Krygyz parliament.
- **Status:** Parxat represents the most important persona with 55% of the survey respondents with mobile phones in this group.
- **Goals:** The father and oldest son from KG_UF1, the father from KG_RF1 and the second friend from KG_RY1 best fit the practically motivated group. These goals were based on stories they conveyed about difficulties they had encountered when looking for professional help especially descriptions given by the male friend in KG_RY1 from his computer club business.
- **Profile:** This profile description was based on one of the male friend participants from Interview KG_RY1. The last advice quote was a direct quote from the father in the KG_UF1 interview.
- **Mobile Phone description:** 91% of the practical group use their phones for personal calls; 41% for work - the most of any group. This description also reinforces the primary motivation of the group, "I got my phones to make calls when I am away from home or work". It is notable that this primary motivation is significantly negatively associated with the primary motivations in the other two groups.
- **Quote:** This is a direct quote from the father participant in Interview KG_UF1.

- **Key Difference:** 41% of the practical motivation group used their phones for work - this was significantly more than the other two groups.
- **Key Difference:** 41% of the practical motivation group bought their phones new - more than any other group (most survey respondents received their phones as gifts).
- **Key Difference:** The practical group had more experience with computers and internet than any of the other two groups: 49% used computers, 39% owned a computer (significant difference), 29% used the internet.
- **Age:** Actual mean age of the group was 35.9. This was the oldest mean age, but was skewed higher here to emphasize the difference with the other groups.
- **Profession:** This profession is based on one of the male friends from Interview KG_RY1. 30% of the practical group was employed which was significantly higher than any other groups.
- **Lives:** 66% of practical users live in an urban environment - this is also the urban environment location of the interviews.
- **Home Life:** Mean family size was 3.5 people for the practical group.
- **Russian:** 89% of the practical group speak and read Russian.
- **Primary Home Language:** 50% claimed their primary language at home was Krygyz. This was the highest of any language.
- **Primary Work Language:** 62% of those employed spoke Russian at work.
- **Schooling:** This degree is also based on male friend owned the computer club from Interview KG_RY1. Also, the practical group had significantly more education (avg. 12.5 years) than the replacement group (avg. 11.1 years) and the general population (avg. 10.7 years).
- **Income:** This is slightly higher than the average income of 4775 soms ($137.00) based on August 2008 exchange rate and data from http://enews.ferghana.ru/news.
- **Internet Use:** 29% of this group used the internet - the highest of any group.
- **Length of use, Use how often, Where Use** - All mean numbers based directly on survey data.
- **Computer Use:** 49% of this group used computers - the highest of any group.
- **How Often:** mean number from the survey data.
- **Cable or Satellite TV:** 29% of this group had cable or satellite TV - the second most of any group.
- **Home Landline:** 51% have home landlines - the second most of any group.
- **Mobile Phone:**
- **Length of Use:** mean number from the survey data
- **How acquired:** 41% of the practical motivation group bought their phones new - more than any other group (most survey respondents received their phones as gifts).
- **Use how often:** mean number from survey data
- **For:** All groups used their phones mostly for personal calls. 41% of the practical motivation group used their phones for work. This was statistically significantly more than the other two groups.
- **SMS:** 27% of the practical group used SMS. This split was based on the numbers given by the older son participant from Interview KG_UF1.
- **Feelings and concerns:**
  61% felt mobile activity was monitored. This was statistically significantly higher than any other group (no other group was higher than 45%);
  57% claimed they would miss their phones "a lot" - this was the most of any group ;
  66% felt mobile access was too expensive.

Shirin Persona Data Detail

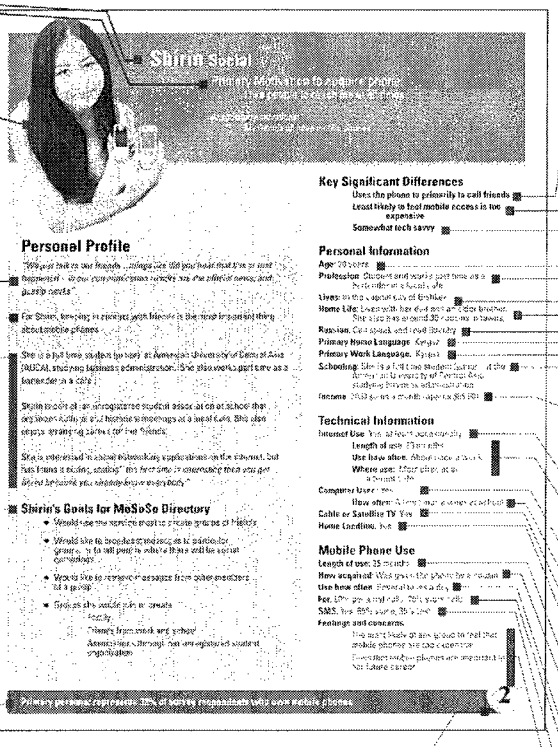


Photo: Younger female participant from the interview with three urban young friends (KG_UY1). The participant actually lives in Bishkek, is eighteen years old and is a student at the American University of Central Asia.

Motivation: We placed the 460 survey participants with mobile phones in one of three groups based on their responses. We found that 352 of these respondents claimed motivations that fell into one of the three final motivation groups without overlap.

There were 113 individuals in the social motivation group. A majority (85%) wanted people to reach them at all times, 19% of this group got their mobile phone because their friends all had them, and 4% wanted to receive voicemail.

Name: Shirin is a somewhat common female name in Kyrgyzstan. It is of Persian origin.

Status: Shirin represents the second most important persona with 32% of the survey respondents with mobile phones in this group.

Goals: Since the youngest son from the KG_UF1, and five of the younger participants from KG_UY1 and KG_RY1 best fit the socially motivated group, these goals were based on how mobile phone use could have helped them in stories they conveyed about their lives. These stories were also used to create the scenarios for Shirin.

Profile: This profile description was on an amalgamation of participants from two interviews: one with a group of three young friends in Bishkek (urban) and the other with a group of three young friends in Kara Balta (rural). The last quote was a direct quote from one of the participants in Bishkek from the KG_UY1 interview.

Mobile Phone description: 93% of the social group use their phones for personal calls - the most of any group; 38% for work.

Quote: This is a direct quote from one of the participants in when asked about where they looked for news and information.

Key Difference: 93% of the social motivation group used their phones for work - this slightly more than the other two groups

Key Difference: Only 50% of the social motivation group felt that mobile phone access was too expensive while the other two groups over 64% felt it was too expensive. This was a statistically significant difference.

Key Difference: The social group had the second most experience with computers and internet : 43% used computers, 26% owned a computer, 25% used the internet.

Age: Actual mean age of the group was 33.6. This was the youngest mean age, but was skewed lower here to emphasize the difference with the other groups.

Profession: This profession is based on three interviews that included a total of seven younger people under the age of 27. Four were students. This part time job was based the profile of an urban male student in KG_UY1.

Lives: 64% of social users live in an urban environment - this is also the urban environment location of the interviews.

Home Life: Mean family size was 3.8 people for the social group. The multiple cousins reference was based on information from a female interview participant.

Russian: 77% of the social group speak and read Russian.

Primary Home Language: 62% claimed their primary language at home was Krygyz.

Primary Work Language: 56% of those employed spoke Krygyz at work.

Schooling: The degree and university are based on the male friend from the KG_UY1 interview.- the same participant that we based the part-time job upon. Members of the social group on average have 12.6 years of schooling - the most of any group.

Income: This is lower than the average income of 4775 soms ($137.00) based on August 2008 exchange rate and data from http://enews.ferghana.ru/news. Since our persona was a student working part time we assumed a lower than average income.

Internet Use: 26% of this group used the internet - the second highest of any group.

Length of use, Use how often, Where Use - All mean numbers based directly on survey data

Computer Use: 43% of this group used computers - the second highest of any group.

How Often: mean number from the survey data.

Cable or Satellite TV: 32% of this group had cable or satellite TV - the most of any group.

Home Landline: 54% have home landlines - the most of any group.

Mobile Phone:

Length of Use: mean number from the survey data

How acquired: 42% of the social motivation group received their phones as gifts from family members - this was the most common way to acquire a phone for this group.

Use how often: mean number from survey data

For: While all groups used their phones mostly for personal calls, 93% of the social motivation group used their phones for personal calls - the most of any group.

SMS: 27% of the social group used SMS. This split was based on the numbers given by the young rural participants in KG_RY1

Feelings and concerns:

51% felt that mobiles phones were too expensive which was significantly less than the other two groups where over 64% felt they were too expensive.

83% felt mobile phones were important to their future career - the most of any group.

Roza Persona Data Detail

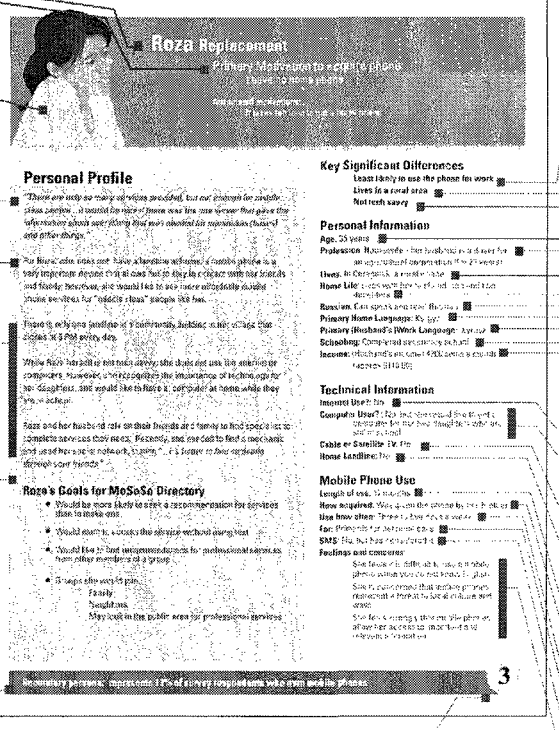


Photo: Middle age female participant from interview KG_RF1. The participant was one of three participants in the interview which included her husband and a younger brother. She lives in Kara Balta, an rural area outside of Bishkek.

Motivation: We placed the 460 survey participants with mobile phones in one of three groups based on their responses. We found that 352 of these respondents claimed motivations that fell into one of the three final motivation groups without overlap.

There were 45 individuals in the replacement motivation group. A large majority (84%) of this group claimed to not have a phone at home, 7% said their home phone line was bad quality and 9% felt that home phones took too long to install.

Name: Roza, from the same derivative as Rose, is somewhat common in Kyrgyzstan. The -z- spelling reflects the French, Slavic, or Yiddish influence.

Status: Roza represents the third most important persona with 13% of the survey respondents with mobile phones in this group, as such, she is a secondary persona.

Goals: These goals were based on how mobile phone use could have helped in stories conveyed by the family participants: KG_UF1 and KG_RF1. This group would be the least likely to use text to access the service.

Profile: This profile description was based primarily from the father in the interview with the rural family (KG_RF1). The last quote was from the father in the urban family interview, but reflected the scenario story from the rural family of trying to connect a gas line. (See scenarios). The village phone line story is directly from the rural family interview.

Mobile Phone description: 91% of the replacement group use their phones for personal calls; and only 18% for work - this represents the lowest use for work of any group.

Quote: This is a direct quote from the father participant from the urban family interview (KG_UF1) when asked about where he found a mechanic. The statement emphasizes the importance of social networks when finding services.

Key Difference: Only 18% of the replacement motivation group used their phones for work - this is the lowest of any group

Key Difference: 82% of the replacement motivation group lives in a rural area. This is statistically significantly more than any other group.

Key Difference: The replacement group is the least tech savvy of all groups: 33% used computers, 7% owned a computer, 20% used the internet.

Age: Actual mean age of the group was 35.6. This was the middle mean age when compared to the other two groups.

Profession: This group is the least likely to be employed: only 13% of respondents in this group were employed full time (self-employment was not counted). The husbands job was based on the father participant's job from the KG_RF1 (rural family) interview.

Lives: 82% of replacement users live in a rural environment. This is statistically significantly more than any other group.

Home Life: Mean family size was 4.4 people for the replacement group. This is statistically significantly larger than any other group.

Russian: 78% of the replacement group speak and read Russian.

Primary Home Language: 65% of this group claimed their primary language at home was Krygyz.

Primary Work Language: 62% of those employed spoke Krygyz at work.

Schooling: 65% of the replacement group claimed secondary school as their highest level of education. Members of the replacement group on average have 11.1 years of schooling which is statistically significantly lower than the other two groups (but still more than non-mobile phone users at 10.7 years).

Income: This is lower than the average income of 4775 soms ($137.00) based on August 2008 exchange rate and data from http://enews.ferghana.ru/news. Since replacement users tend to live in a rural area we made them less affluent than the average.

Internet Use: 20% of this group used the internet - the lowest of any group.

Computer Use: 33% of this group used computers - the lowest of any group. The additional information about the desire for a computer is from the mother from the rural family interview (KG_RF1)

Cable or Satellite TV: 9% of this group had cable or satellite TV. This is statistically significantly lower than any other group.

Home Landline: 2% have home landlines, which makes sense since a lack of a landline is the primary motivation for the group. Not surprisingly, this is statistically significantly lower than any other group.

Mobile Phone:

Length of Use: mean number from the survey data

How acquired: 56% of the replacement motivation received their phones as gifts from family members. This was the most of any group.

Use how often: mean number from survey data

For: 91% of the replacement motivation group used their phones for personal calls.

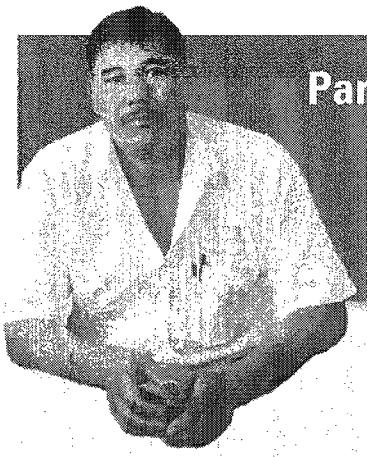
SMS: Only 13% of the replacement group used SMS. This was the lowest of any group.

Feelings and concerns:

70% expressed concerns that one needs to know English to use a mobile phone. This was statistically significantly higher than any other group;

32% were concerned that mobile phones represented a threat to local culture and ways. This was higher than the other two groups;

93% expressed that mobiles allowed access to relevant information. This was the highest of any group.



Parxat Practical

Primary Motivation to acquire phone:
I got my mobile phone to make calls when I am away from work or home

Associated motivations:
I got a good price on my phone and mobile phones are cheaper than landlines

Interactions with the service

Interaction One:

1. When Parxat arrives at his small computer club in the morning, he sees a flyer advertising the MoSoSo directory. The flyer explains that as a small business owner he can add his business to a public information space where users can vote to recommend shops and services.
2. Parxat calls the service and discovers that listing a service requires using text.
3. Navigating the service through a series of text messages, he decides to locate his shop under category called "Computer cafe/club". The entry system allows Parxat to set up two types of advertisements, one for users who utilize text and one for users who do not use text.
4. Later, Parxat asks one of his clients, Ilzat, to call the service and submit a positive vote. Ilzat already belongs to a private shared directory. Izlat offers to not only give Parxat's shop a good vote in the public directory, but to also add it as a recommended computer club in his private shared directory.

Interaction two:

1. Parxat's small computer club is doing well; however, he knows he could do better if he had Internet access for his customers.
2. Parxat has never set-up a network, and he does not even know where to start. He asks around to his friends, customers and family if anyone knows someone who can help. No one in his social network has any ideas.
3. Parxat decides text the MoSoSo directory to find a recommended network technician.
4. While not knowing any of the people who are recommended in the directory, Parxat is skeptical, but he gives a technician, named Dima, a call.
5. Since Dima's business is very new he wants to do everything he can to get a good recommendation from Parxat.
6. One month later, Parxat has an Internet connection in his club, Dima has a recommendation from Parxat in the public directory, and Parxat and Dima start their own private shared directory for computer and Internet club owners.

Parxat represents 55% of survey respondents who own mobile phones

1



Shirin Social

Primary Motivation to acquire phone:
I like people to reach me at all times

Associated motivations:
My friends all have mobile phones

Interactions with the service

Interaction One:

1. As a cofounder of an unregistered student organization, Shirin is always trying to find ways to recruit new members on campus and let existing members know about upcoming events and meetings.
2. After hearing about the MoSoSo directory she decides to set up a private shared directory for her student organization using SMS/text.
3. She also wants to set up the directory so that users can get notices in several different ways. They can (1) call in for new information, (2) ask for a text alert when there is new information and then call in, or (3) sign up for text broadcasts.
4. A few days later, once the shared directory has been set up, she sends out a new message about an upcoming meeting for group members using SMS/text.

Interaction two:

1. Shirin's boyfriend, Talik, works at the same cafe she does.
2. It is common for the workers from their cafe to challenge workers from other cafes to battle on a paintball course.
3. Talik enjoys organizing these events and has set up a MoSoSo shared directory to assist his organizational efforts. Everyone in the group has agreed to accept broadcast messages.
4. On Saturday, their cafe is supposed to fight a local cafe; each agrees to recruit ten workers.
5. However, when Saturday comes around, only seven workers show up. His cafe will have to forfeit if they cannot recruit ten people.
6. Talik broadcasts a message to all group members who are part of the shared private ; he discovers several people in the group forgot about the event, and that his broadcast reminded them. Consequently, the cafe was able to challenge the rival cafe on the paintball course.

Shirin represents 32% of survey respondents who own mobile phones

2



Roza Replacement

Primary Motivation to acquire phone:
I have no home phone

Associated motivations:
It takes too long to get a home phone

Interaction with the service

Interaction One:

1. When Roza's husband, Ermek, left for work this morning he discovered that their car would not start. He called a co-worker who luckily was able to pick up Ermek on his way to the local farm where they both work. Ermek asked Roza to find a mechanic to fix the car as soon as possible.
2. Trusting her social network for answers, Roza began to call friends and family to see if anyone knew of a good mechanic with expertise fixing their make and model of car.
3. Her sister-in-law suggested Roza call the general information line. This suggestion frustrated Roza because it can several hours to get through the information line and then she will have no idea if the mechanic will be up to the task of fixing her car.
4. Rather than calling the information line right away, Roza called a neighbor who tells her about the MoSoSo directory and gives Roza a password for a shared group directory that many in her neighborhood are part of.
5. Since Roza does not use text messaging, Roza is pleased to find she can interact using only her keypad by answering questions that guide her to a list of locally recommended mechanics.
6. After navigating her way through the phone tree, Roza finds a mechanic that the neighborhood group recommended.

Interaction two:

1. No secondary interaction created for Roza due to low representation of the population

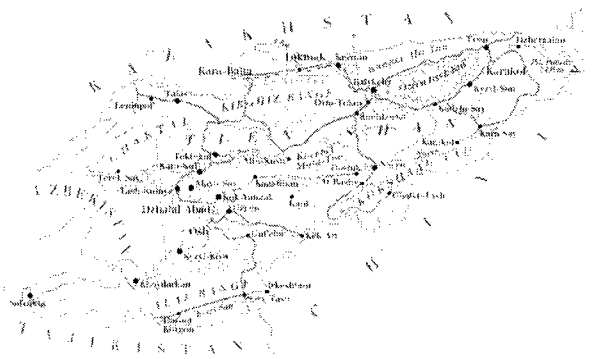
Roza represents 13% of survey respondents who own mobile phones

C.6: Budget (fictional)

Item		Computation	Cost
A. Equipment			
1.	Telephony system	$1500.00 x 1	$1500.00
2.	Server	$2000.00 x 1	$2000.00
3.	1- Computer	$1200.00 x 1	$1200.00
	Subtotal		**$4700.00**
B. Design and Development /Personnel			
1.	Interaction designer x 1	$350.00 a day x 20	$7000.00
2.	Developers x 2	$400.00 a day x 20	$16000.00
3.	Telephony system consultant x 1	$400.00 a day x 1	$400.00
4.	Translation consultant	$300.00 a day x 3	$900.00
5.	Project Manager	$300.00 a day x 30	$9000.00
6.	Tester (needs to know Russian)	$350.00 a day x 10	$3500.00
	Subtotal		**$36800.00**
C. Pilot study (Local)			
1.	Usability consultants x 2	$400.00 a day x 5	$4000.00
2.	Lab rental	$100 per hour	$1000.00
3.	Participant recruitment	$250.00 per part x 5	$1500.00
4.	Participant reimbursement x 5	$200 x 5	$1000.00
	Subtotal		**$7500.00**
D. Pilot study (Kyrgyzstan)			
1.	USA Usability consultants x 1	$400.00 a day x 15	$6000.00
2.	Research group x 3 (include PM + 2 research assistants)	Avg - $200.00 a day x 15	$9000.00
3.	Travel (Airline for four)	$4500.00	$4500.00
4.	Lodging (house rental)	$1000.00	$1000.00
5.	Expenses	$2500.00	$2500.00
6.	Participant recruitment	$50.00 per part x 5	$250.00
7.	Participant reimbursement	$50.00 a day x 5	$250.00
8.	Local Research Assistants (translation) (2)	$75.00 a day x 12	$1800.00
9.	Local Usability consultant	$125.00 a day x 10	$1250.00
	Subtotal		**$26550.00**
	Total		**$75550.00**

C.7: Schedule (fictional)

C.8: Kyrgyzstan Quick Sheet



Kyrgyzstan - quick facts

The country is about 198,500 square kilometers which is slightly larger than South Dakota (196,500 sq. km) and smaller than Minnesota (206,200 sq. km). According to the CIA fact book, its population is of 5,400,000 is about the same as the population of Minnesota. The earliest decedents of the Kyrgyz people are believed to be Turkic who lived in the north-eastern part of Mongolia, settling in the region during the 15th and 16th centuries.

Population

Kyrgyzstan now has a very young and literate population. The median age is 24.2 years, compared to the USA at a median age of 36.7 years. The population is 98.7% literate; literacy is defined by those 15 years and older with the ability to read and write. For comparison, the USA is considered 99% literate. Most Kyrgyz consider themselves Sunni Muslims. Ethnically, the population is largely Kyrgyz 64.9%, followed by Uzbek 13.8%, and Russian at 12.5%

Economy

Kyrgyzstan has had economic difficulties since independence from the Soviet Union which is not surprising considering, that in 1990, 98% of Kyrgyz exports went to parts of the Soviet Union. Unemployment is estimated at 18% compared to 4.6% in the U.S. according to the CIA fact book.

Agriculture is a key sector of the economy; in 2002 agriculture accounted for about a third (35.6%) of the gross national product and about half of the employment. The mountainous terrain lends itself to livestock raising which is the largest agricultural activity. Additionally, Kyrgyzstan is rich in minerals, including gold, mercury and uranium. While it has large deposits in natural gas, it is not rich in petroleum which is has to import. It's largest trading partner is Russia (31%), followed by the U.S. (17.1%), China (11.3%), Kazakhstan (9.1%) and Uzbekistan (3.9%).

Brief Political History

The region has seen many political ups and downs over the last century, but especially in the last 20 years. Soviet power began sometime around 1918, but it was not until 1936 that the Kirghiz Soviet Socialist Republic was established as part of the Soviet Union. In August of 1991, Kyrgyzstan claimed independence from the Soviet Union and joined the United Nations (UN) and the Organization for Security and Co-operation in Europe (OSCE) shortly thereafter. President Akayev was elected the first president; however, he left office in turmoil.

President Akayev was accused of election fraud in the February 2005 elections; the accusations spurred major protests throughout the country, now referred to as the "Tulip Revolution". Protesters seized the presidential administration building in March 2005 causing Akayev to flee to Kazakhstan and then later to Russia. In July 2005 opposition leader Bakiyev won the presidency with over 88% of the vote.

After Bakiyev won the presidency with the promise of reform, he found himself under pressure from demonstrations to sign an amended constitution to limit the powers of the president and increase the role of parliament. The referendum was considered flawed and Bakiyev subsequently dissolved parliament, and called for early elections. He gained control of the new parliament through his newly-created political party, Ak Jol, in December 2007 and much of the political powers of the president were restored. The current political concerns in Kyrgyzstan include: negative trends in democracy and political freedoms, reduction of corruption, and privatization of state-owned enterprises.

Current Concerns and conditions

The people of Kyrgyzstan are relatively poor. The average income is 4775 soms, which translates to $137.00 (source). This information is based on August 2008 exchange rate.

There are many current environmental and political concerns. Environmental concerns include water pollution. Much of the population gets their water directly from contaminated streams and wells, and as a result, water-borne diseases are prevalent. Additionally, increasing soil salinity has increased from faulty irrigation practices. Future political concerns include corruption, further restructuring of domestic industry and success in attracting foreign investment.

C.9: Map of Central Asia



Appendix D: Follow-up survey

This is survey 1a. The surveys used a branching format. This survey went to screening survey respondents who claimed to be 'users' of personas. See Chapter 5 for more detail about the branching design.

You received a link to this survey in email because on a previous screening survey (1) you agreed to be contacted for a follow-up survey; (2) you stated that you are 18 years or older; and (3) you stated that you are professionally involved in the creation or evaluation of software technology.

As a reminder, the screening survey was part of a study investigating how design/development teams leverage user experience research. This survey explores this subject in greater depth.

This survey contains two parts: Part one should take no more than 15 minutes to complete and Part two should take no more than 10 minutes to complete. We will be offering a $10.00 gift certificate as compensation for completion of each part ($20.00 total). You are not obligated to complete part two to receive the gift certificate for part one completion. Additionally, you can save the link for part two and take it at a later date.

Your survey information will be completely confidential.

You can withdraw from the study at any time by closing your browser window. Participating in this study should cause no more discomfort than reading any general information you might find on the Web and answering questions about it.
Use the next and previous buttons provided in the survey interface since the back and next buttons in your browser may not allow the survey tools to save your results.

If you have any questions, concerns or suggestions, feel free to contact us through Cynthia Putnam at cyputnam@u.washington.edu. Thank you for your contribution to this research.

I have read the above information and I consent to participate in the study.

Required.

- (•) No
- ( ) Yes

Please describe you level of agreement to each of the statements below.
I spend a lot of time understanding the problem and the problem constraints of a design/project before I begin designing/coding.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I spend a lot of time focused on gathering information about the what the design/project will need from external sources. (By external sources we mean those sources other than what is already in your head).

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I like to get to designing/coding quickly, where I try work through solutions right away.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I rely primarily on my prior knowledge to develop solutions and less on external sources.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Tell us the first three things that come to mind when you think about personas.

Approximately over the last ten years how many projects were you given personas to use?

- 1 project
- 2 projects
- 3 projects
- 4-5 projects
- 6-7 projects
- 8-9 projects
- 10-11 projects
- Over 12 projects

Describe the last time you utilized personas. What was the project, how were they presented to you e.g. posters, fact sheets, how did you feel about them...etc.?

The last time you were given personas, how effective do you think they were at communicating user research to you?

- Very ineffective
- Somewhat ineffective
- Neutral
- Somewhat effective
- Very effective

What reasons would you give for the answer above? In other words, what made the personas effective or non effective conduits for communicating user research?

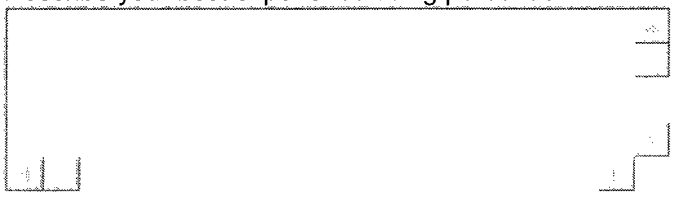
Please describe the type of information contained in the personas that you felt was most useful to helping you with your work the LAST time you utilized personas. What was included that was not useful?



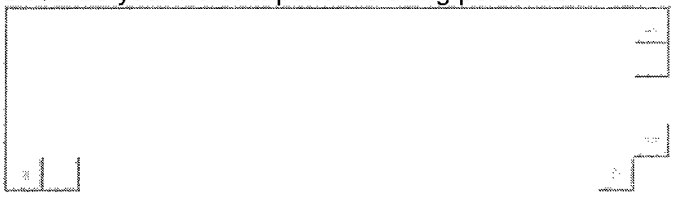
How supportive was your company of the use of personas the last time you utilized personas?

- Very non-supportive
- Somewhat non-supportive
- Neutral
- Somewhat supportive
- Very supportive

Describe your best experience using personas.



Describe your worst experience using personas.



Personas help me have more empathy with the perspective of a user.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I have never been surprised by the depiction of a user described by a persona.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Personas help me focus on specific users.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Personas help me communicate better about users to other members of the design and development team.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Often, I find that personas describe users that are exactly like I had imagined even before I was given any user research.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Please tell us what kinds of factors you think effect the quality of personas.



About how many users do you think one should consult/survey/interview before creating personas?

- ○ Less than 5
- ○ More than 5 but less than 15
- ○ More than 15 but less than 50
- ○ More than 50 but less than 100
- ○ As many as possible
- ○ I do not know
- ○ It depends on many variables. Those variables include:

Is there a minimum number of users you think one should consult/survey/interview before creating personas?

- ○ No
- ○ I do not know
- ○ Yes, and that number is

Please describe how you think a researcher/research team should gather and analyze information to create personas.



How important is it for you to understand how the personas were created?

In other words, do you care about the research methods and/or analysis methods used to create personas?

Examples of research methods might include online surveys, door to door surveys, and interviews. Examples of analysis methods might include statistical analysis and interview transcript analysis.

- ○ Very unimportant
- ○ Unimportant
- ○ Neutral
- ○ Important
- ○ Very important
- ○ I have never thought about it before, but now that you mention it, I guess I would say:

Use this space to add any thoughts you have about the importance of the transparency of research methods used to create personas.

How have personas been presented to you in the past? Examples might include posters, fact sheets, keychains....etc.

Describe how effective you feel the presentation methods you listed above were to your understanding of the personas?

How do you think personas should be presented to design team members to maximize their effectiveness?

When given personas, how important is it for you to know the researcher or research group's credentials, experience and/or education?

- Very unimportant
- Unimportant
- Neutral
- Important
- Very Important
- I have never thought about it before, but now that you mention it, I guess I would say:

Use this space to add any thoughts you have about the importance of knowing the researcher or research team's background when considering the use of personas.

Do you think the effectiveness of personas is dependant on who they are describing? Please answer for the examples listed below.

Example 1: Do you feel personas would be more or less effective at conveying user research when they describe mobile phone users in Kyrgyzstan compared to office workers in Seattle.

Assume that all the personas were of equal quality.

- Much less effective, the personas of office workers in Seattle would be more effective.
- Less effective
- There is no difference
- More effective
- Much more effective, the personas of mobile mobile phone users in Kyrgyzstan would be more effective.
- Other:

Example 2: Do you feel personas would be more or less effective at conveying user research when they describe computer users with autism compared to office workers in Seattle.

Assume that all the personas were of equal quality.

- Much less effective, the personas of office workers in Seattle would be more effective.
- Less effective
- There is no difference
- More effective
- Much more effective, the personas of computer users with autism would be more effective.
- Other:

Use this space to add any thoughts you have about the importance of who the personas are describing relative to their effectiveness as conduits of user research.

What city, state, country do you work in?



Thanks for completing part one of the follow-up survey. Please fill out your email address so we can send you a $10.00 Amazon.com gift certificate for your time.



Your responses have been submitted. Your confirmation code is XXXXXXX

Please follow the link below to complete part two of the survey.

We will send you an additional $10 Amazon gift certificate for completion of part two.

Appendix E: Debriefing interview script

Interview Protocol – Name:

A. Introduction – not recorded

a. Consent form – give the participant the consent form – See Appendix B – The consent form identifies me as a researcher looking for designer and developer feedback on a university research group's project.

START VIDEOTAPE – after consent

B. Preamble – 20 minutes

a. Discuss job responsibilities (get initial information from screening survey sent by the participant)

b. Tell me what you know about Kyrgyzstan, culture, people, technology profile...etc. Expand on my role as helping a group of local researchers who are planning on developing technology products for people in Kyrgyzstan.

C. Instructions

a. Explain think-aloud protocol for introduction only (TaP)– give participant TaP instructions – See Appendix D – demonstrate instructions using a flashlight, have the participant demonstrate using a different flashlight (bring flashlight and batteries)

D. Introduce materials

a. Give materials and ask them to describe –
   i. Materials to include:
      1. Task
      2. Telephony sheet
         a. Profiles
         b. Interactions

   ii. As you look at the materials, tell me your impressions of the background materials. Practice your TaP as you look over the materials.

   iii. Show the participant that there is more background information available if they would like to see it. Tell them this information includes:
      1. Details
      2. Budget

3. Timeline
4. A fact sheet about Kyrgyzstan
5. A map of Central Asia
6. Access to the Lab computer to search for anything they would like on the internet

b. Ask the participant if they need anything clarified about the problem. Ask them to repeat back what they think the task is in their own words.

E. **Design Task –up to 90 minutes.**

a. Once given the task, I will move to the other side of the wall in the Lab. They will be told that I can answer questions about process, but not pertaining to information. I will encourage them to speak the question out loud, and if I can answer questions I will.

F. Debrief on design – 15 minutes

a. On a scale of 1 to 10, how happy are you with the design?

b. What might you do differently if you had more time?

c. Talk about the research materials, what was helpful, what wasn't and/or what would have you liked to have seen?

d. Do you have any experience designing interactions like this? With telephony systems?

e. What was the most difficult thing about this task?

STOP VIDEOTAPE – audiotape only for remaining

G. Probe on personas and scenarios– 45 minutes – audiotape

1. Probe for experience with personas and scenarios (ask only of those participants with past experience).
   a. Tell me the first three things that come to mind when you think about personas?

   b. Tell me the first three things that come to mind when you think about scenarios?

   c. Do you recognize the personas and scenarios? (This may be obvious if the participant talks about the documentation as personas and scenarios).

d. If they have persona and /or scenario experience:

i. If yes, approximately over the last ten years how many projects were you given personas and/or scenarios?
   1. Personas
   2. Scenarios

ii. If yes, tell me about the last time.
   1. Personas
   2. Scenarios

iii. If yes, tell me about your best experience.
   1. Personas
   2. Scenarios

iv. If yes, tell me about your worst experience.
   1. Personas
   2. Scenarios

v. If yes, did personas and/or scenario information ever surprise you?

vi. Last time you used them, was your company supportive?

vii. Last time you used them, how were they presented to you? How did you feel about the presentation?

e. Ask questions based on a five point likert where five is strong agreement and one is strong disagreement:

i. Personas help me have more empathy with the perspective of a user.

ii. Scenarios help me have more empathy with the perspective of a user.

iii. Personas help me focus on specific users.

iv. Scenarios help me focus on specific users in specific situations).

v. Personas help me communicate better about users to other members of the design and development team.

vi. Scenarios help me communicate better about users to other members of the design and development team.

vii. Often time, I find that personas describe users that are exactly like I had imagined before I ever saw any user research.

viii. Often time, I find that scenarios describe interactions that are exactly like I had imagined before I ever saw any user research.

Asked of all participants

2. Open ended: Can you tell me, what kinds of factors you think affect the quality of personas and scenarios?

Once asked the open-ended question it is possible they will have independently brought up some of the factors below:

3. Probe for items that contribute to the success or failure of personas and scenarios
    a. *Sample size:* I would like to know if sample size used to create the personas and scenarios is important to you? About how many users do you think one should consult/survey/interview before creating documents like the personas and scenarios you just used?

       Is there a minimum number?

    b. *Methods:* I would like to know if the methods used in creating personas and scenarios matter to you.
        i. Tell me what type of research you think one should perform before creating persona and scenario documents. For example, surveys, interviews, focus groups…all of the above?

ii. Do you think there is a difference between the type of research someone should do to create personas versus scenarios?

1. If I were to say:
    a. These personas and scenarios were created using multivariate statistical analysis and the results were statistically significant. What do you think?

    b. These persona and scenarios were created by analyzing interview protocol and probing for patterns in the responses. The patterns were independently verified by two researchers. What do you think?

c. *Presentation:* I would like to know if the presentation was effective.
    i. In this case you were given single sheets with personas, scenarios and had access to supplemental sheets explaining the data points. How did you feel about this presentation?

    ii. Do you have any ideas on effective ways to present personas? What about scenarios?

    iii. If instead, I were to present the personas:
        1. Through a dramatic short play

        2. Through life size posters

        3. Action figures
    iv. If instead, I were to present the scenarios
        1. Through visual storyboards

        2. Through a video with actors

d. *Author/Creator:* I would like to know if the profile of a group or individuals within that group who created the personas and scenario matters to you.
    i. How much do you think the research group members who created these documents knew about design and designers? Explain.

ii. Do you want to know their background?

iii. Does knowing their background make the personas and scenarios more or less credible? For example:
    1. If I were to say, that these personas and scenarios were created by a group led by a cognitive psychologist with a PhD and 20 years of experience in UX research.

    2. If I were to say, that these personas and scenarios were created by a single interaction designer with 10 years experience in design and a PhD.

    3. If I were to say, that these personas and scenarios were created by a group of Masters Students.

4. Probe for whether the personas/scenarios met their claims.
    a. Ask several questions based on a 5 point likert where 5 is strong agreement and 1 is strong disagreement:

        i. Stereotype avoidance: Remind them first of their original assumptions
            1. Were your initial assumptions about people from Kyrgyzstan confirmed by the personas and scenarios?

            2. Were you at all surprised about what you learned about mobile phone users from Kyrgyzstan – which documents surprised you more?

            3. Discuss how your initial assumptions changed or were confirmed.

        ii. Increased empathy- does the participant bridge the gap with the Kyrgyz user? Look for participants getting inside of the persona's head, their motivations, feelings and ideas, i.e emotional model of each.

            1. Roza does not drive, and relies on a network of local mini-buses. There is no published bus schedule and often times, if a bus is full, it will not even stop. Can you talk about what challenges she might face getting to town for a scheduled meeting?

a. What kinds of solutions do you think could help Roza?

2. Do you think that Parxat, Shirin or Roza would enjoy travel? If so, where do you think they would like to go?

a. On a scale of 1-5 (5 being the most confident), how confident do you feel about your answer?

iii. Increased Communication- does the participant have an understanding of the persona – enough to discuss (communicate about) facts about the personas; i.e., mental model of each.

1. Without referring back to the personas, can you tell me how often each of them use text.
   a. On a scale of 1-5 (5 being the most confident), how confident do you feel about your answer?

2. Without referring back to the personas, how often does each use the internet?
   a. On a scale of 1-5 (5 being the most confident), how confident do you feel about your answer?

3. Which documents helped you more in understanding these technical facts about the personas – the personas themselves or the scenarios?

iv. Increased focus:

1. What considerations did you make specifically for Parxat in your design? Shirin?

5. Distant audience affect:
   a. Talk about the differences in using these personas/scenarios (and specifically about the fact they describe a geographically and culturally distant audience) from those you have used previously. –

b. Do you feel personas/scenarios would be more or less effective at conveying user research when they describe mobile phone users in Kyrgyzstan compared to office workers in Seattle.

- ○ Much less effective, the personas of office workers in Seattle would be more effective.
- ○ Less effective
- ○ There is no difference
- ○ More effective
- ○ Much more effective, the personas of mobile phone users in Kyrgyzstan would be more effective.

What about teens with autism – same?

6. Closing – **15 minutes – audio taped ONLY**
   a. I am to giving you four cards with statements, tell me which bests describes how your approach to design problems: (Printed on four cards):
      i. I spend a lot of time understanding the problem constraints of the design before I begin. (This represented a problem based strategy)
      ii. I spend a lot of time focused on gathering information about what the design will need from external sources. (This corresponded to information driven strategy, the sub-variant of problem-based)
      iii. I like to get to designing quickly, where I try work through solutions right away. (This characterized a solution-based strategy)
      iv. I rely primarily on my prior knowledge to develop a solution and less on external sources. (This represented a knowledge driven strategy, the sub variant of solution-based).

IRI test on computer

Appendix F: Follow-up survey emails

For those who utilized user research:

You are receiving this email because of your answers on a screening survey you completed on <date>. As a reminder, the screening survey was part of a study investigating how design/development teams leverage user experience research.

You stated in the screening survey that (1) you have at some point in your career utilized user research and (2) that you would be willing to complete a follow-up survey.

Use the link below to complete the survey. The survey contains two parts: Part one should take no more than 20 minutes to complete and Part two should take no more than 10 minutes to complete. We will be offering a $10.00 gift certificate as compensation for completion of each part ($20.00 total). You are not obligated to complete part two to receive the gift certificate for part one completion.

If you have any questions or concerns, contact us through Cynthia Putnam, at cyputnam@u.washington.edu.

For those who conducted user research:

You are receiving this email because of your answers on a screening survey you completed on <date>. As a reminder, the screening survey was part of a study investigating how design/development teams leverage user experience research.

You stated in the screening survey that (1) you have at some point in your career conducted user research and (2) that you would be willing to complete a follow-up survey.

Use the link below to complete the survey. The survey is in two parts: Part one should take no more than 20 minutes to complete and Part two should take no more than 10 minutes to complete. We will be offering a $10.00 gift certificate as compensation for completion of each part ($20.00 total). You are not obligated to complete part two to receive the gift certificate for part one completion.

If you have any questions or concerns, contact us through Cynthia Putnam, at cyputnam@u.washington.edu.

For those who conducted and utilized user research:

You are receiving this email because of your answers on a screening survey you completed on <date>. As a reminder, the screening survey was part of a study investigating how design/development teams leverage user experience research.

You stated in the screening survey that (1) you have at some point in your career both conducted and utilized user research and (2) that you would be willing to complete a follow-up survey.

Use the link below to complete the survey. The survey is in two parts: part one should take no more than 20 minutes to complete and part two should take no more than 10 minutes to complete. We will be offering a $10.00 gift certificate as compensation for completion of each part ($20.00 total). You are not obligated to complete part two to receive the gift certificate for part one completion.

If you have any questions or concerns, contact us through Cynthia Putnam, at cyputnam@u.washington.edu.

Appendix G: IRI

The respondents and study participants completed an online version of this survey.

Statements	Statement describes me Not well Very well				
	A	**B**	**C**	**D**	**E**
1. I daydream and fantasize, with some regularity, about things that might happen to me. (FS) – FS1Pos	0	1	2	3	4
2. I often have tender, concerned feelings for people less fortunate than me. (EC) EC1 Pos	0	1	2	3	4
3. I sometimes find it difficult to see things from the "other guy's" point of view. (PT) (-) PT1 Neg	4	3	2	1	0
4. Sometimes I don't feel very sorry for other people when they are having problems. (EC) (-) EC2 Neg	4	3	2	1	0
5. I really get involved with the feelings of the characters in a novel. (FS) FS2Pos	0	1	2	3	4
6. In emergency situations, I feel apprehensive and ill-at-ease. (PD) PD1 Pos	0	1	2	3	4
7. I am usually objective when I watch a movie or play, and I don't often get completely caught up in it. (FS) (-) FS3Neg	4	3	2	1	0
8. I try to look at everybody's side of a disagreement before I make a decision. (PT) PT2 Pos	0	1	2	3	4
9. When I see someone being taken advantage of, I feel kind of protective towards them. (EC) EC3Pos	0	1	2	3	4
10. I sometimes feel helpless when I am in the middle of a very emotional situation. (PD) PD 2 Pos	0	1	2	3	4
11. I sometimes try to understand my friends better by imagining how things look from their perspective. (PT) PT3 Pos	0	1	2	3	4
12. Becoming extremely involved in a good book or	4	3	2	1	0

movie is somewhat rare for me. (FS) (-)FS4Neg					
13. When I see someone get hurt, I tend to remain calm. (PD) (-) PD 3 Neg	4	3	2	1	0
14. Other people's misfortunes do not usually disturb me a great deal. (EC) (-) EC4 Neg	4	3	2	1	0
15. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments. (PT) (-) PT 4 Neg	4	3	2	1	0
16. After seeing a play or movie, I have felt as though I were one of the characters. (FS) FS5POS	0	1	2	3	4
17. Being in a tense emotional situation scares me. (PD) PD4 Pos	0	1	2	3	4
18. When I see someone being treated unfairly, I sometimes don't feel very much pity for them. (EC) (-) EC5 Neg	4	3	2	1	0
19. I am usually pretty effective in dealing with emergencies. (PD) (-)PD5 Neg	4	3	2	1	0
20. I am often quite touched by things that I see happen. (EC) EC6 Pos	0	1	2	3	4
21. I believe that there are two sides to every question and try to look at them both. (PT) PT5 Pos					
22. I would describe myself as a pretty soft-hearted person. (EC) EC7 Pos	0	1	2	3	4
23. When I watch a good movie, I can very easily put myself in the place of a leading character. (FS) FS6 POS	0	1	2	3	4
24. I tend to lose control during emergencies. (PD) PD 6 Pos	0	1	2	3	4
25. When I'm upset at someone, I usually try to "put myself in his shoes" for a while. (PT) PT6 Pos	0	1	2	3	4
26. When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me. (FS) FS7POS	0	1	2	3	4

27. When I see someone who badly needs help in an emergency, I go to pieces. (PD) PD 7 Pos		0	1	2	3	4
28. Before criticizing somebody, I try to imagine how I would feel if I were in their place. (PT) PT 7 Pos		0	1	2	3	4
Compute Subscores	List sub-scores below after adding	Add up scores for each subscale				
PT = perspective-taking scale						
FS = fantasy scale						
EC = empathic concern scale						
PD = personal distress scale						
Total Score (add all subscores						

Appendix H: Key differences between Design & UX centric job titles

In this appendix, I summarize key differences that I found between study participants and survey respondents with Designer job titles (Designer, Information Architect, Interaction Designer, Developer and Writer) and survey respondents with UX Centric job titles (Usability Specialist, UX Researcher and UX Architect). Throughout the study, I compared the two groups; however, the research primary questions were focused on the Design audience. As such, I chose to present the key difference findings in this appendix versus incorporating the findings in the chapter and dissertation summaries.

The differences between the job title types supported the assumption that UX research is more often conducted by one group and then communicated to another. In other words, this finding supports assertions by others (Pruitt & Adlin, 2006) that very few professionals are tasked with both user research and creation of technology. This suggests that the need for communication between the groups, whether it is facilitated by personas and context scenarios or some other tool, is critical to how end users are included in the design and development process.

In the following sections I present key difference only from the screening survey (section H.1), empathy IRI tests (section H.2), past experiences (section H.3), salience of perception-related and exogenous variables (section H.4) and agreement to claims (section H.5).

H.1: Screening survey

There were three major areas of difference between the UX Centric and Designer groups in the screening survey data: (1) how the user was described in an open-ended query about job responsibilities (section H.1.1); (2) respondent's self

identified role relative to UX research (section H.1.2); and (3) the degree of alignment to the principles outlined by Gould and Lewis (section H.1.3).

H.1.1: How the user was included

There were 127 coded responses about user inclusion in the open ended question about job responsibilities from the Designer ($N = 92$) and UX Centric ($N = 35$) job title groups. Whereas a high percentage, 57%, of responders in the three UX Centric jobs mentioned end users as part of their job responsibilities, only 4% of those with Designer job titles included end users. The difference between the two groups was significant, χ^2 (1, $N = 127$) = 46.11, $p < .001$.

H.1.2: Role relative to UX research

There were 159 responses in which respondents identified their role relative to UX research from the Designer ($N = 122$) and UX Centric ($N = 37$) job title groups. While 23% of Designers claimed they were 'users' of UX research, only 8% of those with UX Centric job titles claimed to be 'users'. A large majority (76%) of UX Centric job responders reported their role as 'user + conductor/creator', while a minority (40%) of Designers reported the same role. The difference between the two groups was significant, χ^2 (3, $N = 159$) = 18.18, $p < .001$.

H.1.3: Alignment to the Gould & Lewis principles

There were 128 coded responses to the Gould and Lewis probe from the Designer ($N = 94$) and UX Centric ($N = 34$) job title groups. There were significant differences between the groups, t (126) = -3.068, $p < .05$, $d = .73$. Respondents with UX Centric jobs ($N = 34$) recorded the highest scores ($M = 1.88$, $SD = 1.50$), while respondents in Designer job titles ($N = 94$) scored the lowest, ($M = 1.20$, $SD = 1.09$).

H.2: Empathy

Comparing job title types and overall empathy dimension scores provides additional illumination concerning empathy. Respondent and study participants with Designer job titles ($N = 33$) had higher overall scores in all empathy dimensions compared to those with UX Centric job titles ($N = 18$). The differences were significant at the .10 level for empathetic concern, t (48) = 1.95, p = .057 and personal distress, t (48) = 1.71, p = .093. Note that these are two most emotional dimensions.

H.3: Past experiences

There were question areas in which I found differences between the UX Centric and Designer job title groups: (1) when asked about the first three things that came to mind about personas (section H.3.1); (2) in the discussion about the last experience with personas; and (3) in the discussion about the best and worst experiences using personas.

H.3.1: First three things

Designers were more likely to support the focus claim and had more positive things to say; whereas, UX Centric responders were much more likely to concentrate on the importance of research. A summative description of three personas qualities from Designers could read, "*Personas (1) help focus on representations of the targeted people/users/roles that are expected to use the product, (2) describe user abilities and how users will interact with the product and (3) are helpful summarizations that act as a reference.*" Conversely, a statement from those with UX Centric job might read, "*Personas (1) need to include user goals, needs, and desires, (2) can be useful for communication and narrowing the user audience, and (3) are not convincing if they are not based on research data.*"

H.3.2: Last experience

UX Centric responders were much more likely to include the types of research used and the sample size when commenting on their last persona experience. Conversely, Designers focused more on presentation. There was one mention of budget issues negatively affecting persona creation in each group.

Most respondents rated their last experience with personas between the neutral and effective levels; 63% of Designers ($N = 16$) have a favorable opinion compared to 50% of UX Centric responders ($N = 16$); however, the differences were not statistically significant. The average rating for the last use of personas, (success ranked from one to five) for Designers was slightly below effective ($M = 3.63$, $SD = .86$), and about at neutral for UX Centric job title responders, ($M = 3.25$, $SD = 1.18$).

H.3.3: Best and worst experience

Most respondents reported a positive best experience: 81% of Designers reported a positive best experience (the remaining did not complete the question); 87% of UX Centric responders reported a positive best experience, 13% claimed to never have had a positive experience.

The differences between the groups in the worst experience report were more notable. While most respondents also reported a negative worst experience, 56% of Designers reported a negative worst experience and 88% of UX Centric responders reported a negative worst experience.

H.4: Perception

In following sections I summarize the major differences between the groups from each major coded category: (1) presentation of personas/scenarios (section H.4.1); (2) the research used (section H.4.2); (3) distant audience perception (section H.4.3); and (4) exogenous independent variables (section section H.4.4).

H.4.1: Presentation

The importance of presentation on the quality of personas and scenarios was brought up more often by Designers than the UX Centric group; this difference was not significant. Additionally, the groups focused on different aspects of the presentation; whereas Designers were more concerned with the display, the UX Centric groups were more concerned with the actual content and writing quality contained in the documents.

The importance of research regarding the quality of personas and scenarios was much more salient to UX Centric responders when compared to the Designer group; this difference was significant, χ^2 (1, N = 42) = 4.07, p <. 05. The only research area in which Designers mentioned more often was in types of methods.

H.4.3: Methods and research transparency

Salient considerations differed between the two groups in two major ways. First, the UX Centric responders were much more likely to mention any type of additional consideration, presumably because they are more likely to have been responsible for the research and have therefore encountered more items of consideration. Second, almost a third of the UX Centric group was concerned with data analysis while only one in the Designer group expressed this as a consideration. Again, this was probably because the Designer group is rarely tasked with the data analysis.

H.4.3.1: Transparency

When asked directly about research transparency, it was considered 'very important' or 'important' by most (69%) of Designers survey responders. Half of the UX Centric group (50%) also considered research transparency as 'very important' or 'important' for persona/scenario believability. Most of the UX Centric respondents rated transparency of the research as less important suggesting a belief that Designers did not care about the underlying research in a follow-up query. This belief was not consistent with the Designer response.

H.4.4: Distant audience

There were differences among the ratings between two job title types (Designers versus UX Centric).When comparing the Kyrgyz audience to the Seattle audience, the UX Centric group was much more likely to see no difference. However, when considering the autism audience, Designers were much more likely to note differences. In this case the findings between the groups was significant, $\chi^2(2, N = 30) = 6.31, p < .05$.

H.4.5 Exogenous variables

Exogenous variables were a greater concern to the UX Centric group than they were to Designers. The difference was significant χ^2 $(1, N = 42) = 3.97, p <. 05$. A key difference was the consideration of organizational support at the team level; only the UX Centric responders mentioned this.

H.5: Claims

There was only one major difference between the UX Centric and Designer job tile groups relative to the four beneficial claims. When asked if they had ever been surprised (avoiding ill-informed assumption), 60% of Designers claimed that they had *never* been surprised by a depiction of a user described by a persona versus 43% percent of UX Centric responders. Additionally 41% of Designers felt that personas had described users *exactly* like the users they had imagined versus 29% of UX Centric responders. This divide made sense, since UX Centric responders would be reticent to think that the personas they had created were exactly like users Designers already imagined, or that the personas had never surprised Designers.

Vita

Cynthia Putnam began her career as a designer after earning her Bachelor of Science in Industrial Design from Western Washington University in 1984. She returned to school to earn a Master of Science in Technical Communication at the University of Washington in 2006. In 2010, she earned a Doctor of Philosophy at the University of Washington in Human Centered Design & Engineering.