

**BRIDGING RESEARCH AND PRACTICE:  
A THEORETICAL AND EMPIRICAL MAPPING OF DESIGN SPACE  
USING SOLO TRAVEL DOMAIN**

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## **Abstract**

Bridging Research and Practice:  
A Theoretical and Empirical Mapping of Design Space using Solo Travel Domain

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Although researchers have developed a myriad of theories, methods, and tools for interactive design, there remains a large divide between scholarly research and design practice. This divide stems from differences in academics' and design practitioners' training, communication, and even the venues in which they choose to present their work.

This dissertation features an empirical investigation to help bridge this divide. I explore new ways of incorporating research and theory into interactive design, through three projects in the context of solo travel. The projects are based on over 65 hours of in-depth interviews with 21 solo travelers, and are complemented by over 100 hours of observation and participation in solo travel-related events and meet-ups.

I used the findings to develop a novel, two-dimensional analytical design process, embodied in a matrix. The matrix dynamically maps theory with qualitative research and creates a design space articulation that provides designers with a way to identify new design ideas, externalize these developments, and share their work with others. I demonstrate the matrix's utility by discussing how it helped 16 designers collaborate to develop new interactive technology opportunities in the solo travel domain. Applications for how this matrix may be used with other theoretical and normative domains are discussed.

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Dedicated to my alter ego,  
who did not need to be present to be there for me,  
from the depth of my soul.

## Chapter 1. Introduction

“I have become convinced that universities are not devoted to the production and distribution of fundamental knowledge in general. They are institutions committed, for the most part, to a particular epistemology, a view of knowledge that fosters selective inattention to practical competence and professional artistry. [...]

It is as though the practitioner says to his academic colleague, “While I do not accept your view of knowledge, I cannot describe my own.” Sometimes, indeed, the practitioners appear to say, “My kind of knowledge is indiscernible,” or even, “I will not attempt to describe it lest I paralyze myself.”

Donald Schön - *The Reflective Practitioner: How Professionals Think in Action*

Rapid expansion of the Human-Computer Interaction (HCI) field has attracted scholars from a wide range of topics, contexts, and approaches. These diverse perspectives inform how interactive design technology can affect an array of life activities, including education, work, sports, and health care, among many others. At the same time, new developments in interactive technology and its influence on our lives have introduced more *wicked* situations for interaction designers.

These changes highlight the importance of understanding and reflecting on these large, complex design practices, which beg the question, *how do we think systematically as interaction designers?* While design practitioners rely on an array of methods and tools, academic researchers have developed various theories, methods, and models that can help inform practical application. For example, the applied psychology of HCI seeks to show how human action, motivation, and experience can impact the usability of interactive systems while supporting the development of new interactive technology (Carroll, 1991). However, practitioners scarcely employ these academic contributions because they have difficulty learning and implementing them, and see their practicality as limited (Rogers, 2004).

Researchers and design practitioners use different venues to share and discuss their work. While researchers submit papers to academic commons, design practitioners “take a more social approach” and participate in discussions, verbal critiques, or design competitions (Zimmerman, Evenson, & Forlizzi, 2005).

In addition, scholars have attempted to bridge the academic-practice divide by introducing a number of established theories from other disciplines, such as cognitive science and psychology. But these attempts have not been successfully adopted by design practitioners, mounting a debate about whether theory is needed or can even contribute to the design of technology (Rogers, 2004).

Rogers calls for the need to focus on “the *process* of design and how different kinds of designers want to be supported” (p. 134) as a way of investigating whether and how theory and scholarly research can be effectively used in interaction design. Design practitioners are assumed to be able wade through the large pool of interdisciplinary theoretical and methodological tools to determine which are best suited to help design. Here, Rogers invites us to rethink the relationship between researchers and design practitioners and to see them more as partners “engaged in an ongoing dialogue” (p. 134).

Design practitioners are not theorists of human nature, so the challenges of incorporating human theories (psychological and sociological) may deter professionals from turning to theory or scholarly research. The gap between theory and design practice has meaningful implications, including making it difficult for design practitioners to employ the outcomes of HCI research. When theories are not connected to practice, they have limited value. And when practice does not conform to theory, it may produce unintended consequences.

Furthermore, relying on a select set of theories limits design practitioners’ ability to discover new applications for interaction design. As technology touches more aspects of the human experience, more diverse and inclusive theoretical perspectives are needed. For example, there is a growing body of design literature that draws on behavioral theories largely grounded in the health and wellness domains, whereas similar work in the domain of travel is limited.

This dissertation is an empirical investigation of the role that theory and scholarly research play in interaction design, particularly in the travel context. It offers a response to Rogers’ call for focusing on the *process* of design such that it encourages a synergy between design practitioners and researchers. As such, this work is guided by two broad research questions, (1) what role can scholarly research and established theories play in navigating between research data on phenomenological experience and design practice?, and (2) how can scholarly research and established theories help navigate between phenomenological experience and design practice?

This dissertation consists of three design projects to explore new ways of incorporating scholarly research and theory into interactive technology design. In design project 1, I employed a *qualitative approach* and analyzed solo travelers' sociotechnical practices and needs. In design project 2, I took a *theoretical approach* and used three identity theories (the saturated self, the protean self, and the presentation of self in everyday life) to analyze the data. Finally, in design project 3, I took a *Research through Design approach* where I worked with 16 designers to create interactive tools for solo travelers.

The three design projects led to the development of a novel, two-dimensional analytical design process embodied in a matrix that maps dimensions from theory with dimensions that emanated from qualitative research. The matrix acts as a design space articulation, such that it provides designers a way to externalize and articulate their design ideas in reference to the matrix and share their work with others. I discuss the utility of the matrix in Chapter 6 by illustrating how it helped 16 designers collaborate to develop interactive technology in the solo travel domain.

I selected solo travel as a novel context to explore some of the untapped and less studied design spaces that captures fundamental human needs such as self-actualization, self-esteem, and transcendence. These design spaces are less prominent in other contexts and, thus, are rarely explored in design communities.

The findings and design recommendations in this dissertation are based on over 65 hours of in-depth interviews with 21 solo travelers, which have been synthesized by over 100 hours of observation and participation in solo travel-related events and meet-ups.

## **Section A. Research Questions**

This dissertation attempts to address three interrelated research questions:

RQ1- What role can research data on phenomenological experience play in guiding interaction design in the domain of solo travel? (Chapter 4)

RQ2- What role can identity theories play in navigating between research data on phenomenological experience and interaction design in the domain of solo travel? (Chapter 5)

RQ3- How can human motivation theory help navigate between phenomenological experience and interaction design in the domain of solo travel? (Chapter 6)

## Section B. Dissertation Structure

This dissertation consists of seven chapters and presents original research that was conducted in three phases. Building on Zimmerman, Evenson, and Forlizzi's (2005) work on, *Discovering and Extracting Knowledge in the Design Project*, I call each phase a design project. The authors note, “[a]lmost all design work conducted today resides within a project; therefore, we feel the best opportunity for increasing the output and significance of design research comes from identifying area[s] in a project where knowledge can be extracted and documented for a larger audience.”

**Chapter 2** consists of two sections. Section A focuses on the relationship between scholarly research and theories, and interaction design in HCI. I also explore the literature to see how established theories manifest in interaction design and provide a scale of specificity of the use of theory in scholarly publications. Section B provides an overview of the solo travel literature, the role of interactive technology in the travel context, and a definition for sociotechnical practices.

**Chapter 3** describes the methods in three sections. Section A is focused on methodologies of collecting and handling data, Section B discusses the data analysis rigor, and Section C is focused on the methods used in 3 design projects to connect scholarly research to design. These three design projects are interrelated such that projects 2 and 3 utilize part of the findings of the prior design projects. Each design project is described in one separate chapter as follows:

**Chapter 4** describes the design project 1 which is a design exploration through *qualitative analysis* of 26 semi-structured, in-depth interviews with solo travelers. I describe the thematic analysis of the interview data through two research perspectives: (a) what are the sociotechnical practices of solo travelers, and (b) what types of activities solo travelers engage in. The findings of design project 1 are twofold; (a) I discuss the sociotechnical practices of solo travelers through four inductively generated themes, and (b) I develop an activity-based framework that represents the types of activities solo travelers engage in.

**Chapter 5** describes the design project 2, which is a design exploration through a *theoretical approach*. To gain a deeper understanding of solo travelers and empathizing with them, I discuss the connections between solo travel and the issues of self and identity through three identity theories; (1) the protean self, (2) the saturated self, (3) the presentation of self. I describe the analysis of the interview data through these three theories and structure the findings around the

activity framework developed in design project 1. I also introduce a 2-dimensional analytical design matrix inspired and developed by combining the theoretical data analysis with the activity framework.

**Chapter 6** describes design project 3, which is a *Research through Design* (RtD) exploration where I worked with 16 designers to create five interactive tools for solo travelers using the 2-dimensional analytical design matrix developed in design project 2.

**Chapter 7** concludes the presentation of the three design projects. I discuss the utility of the matrix and demonstrate how it may be further used with other theories and in other domains. I revisit the study's research questions, summarize the major contributions of the dissertation, and describe directions for future work.



## Chapter 2. Background

Chapter 2 consists of two sections. Section A introduces existing research on the relationship between scholarly research and theories and interaction design in HCI. I also review the literature to see how established theories manifest in interaction design and provide a scale of specificity of the use of theory in scholarly publications. Section B provides an overview of the solo travel literature, the role of interactive technology in the travel context, and a definition of sociotechnical practices.

### Section A - Research and theory-driven interaction design

Human Computer Interaction (HCI) is a broad field that has expanded rapidly since its start in the early 1980s. ACM SIGCHI Curricula for Human-Computer Interaction defines HCI as “a discipline concerned with the design, evaluation, and implementation of interactive computing systems for human use and with the study of the major phenomenon surrounding them” (Hewett et al., 1996). Alan Dix (2009, p. 1327), in his book *Human-Computer Interaction*, similarly defines HCI as “the study of the way in which computer technology influences human work and activities. [...] HCI has an associated design discipline, sometimes called *Interaction Design* or *User-Centered Design*, focused on how to design computer technology so that it is as easy and pleasant to use as possible.” John Carroll (1991, p. 1) put forth a more succinct definition: an “interdisciplinary area of applied research and design practice.”

Although there is not a single, agreed upon definition, the three mentioned above, and others (Card, Moran, & Newell, 1980) consist of three main parts: (1) HCI is concerned with design practice, (2) HCI is concerned with the broader context of the design involving humans and technology, and (3) HCI is concerned with applied research. In other words, HCI is both a *research* and a *design practice* field. The aim of HCI research is to study how technology impacts humans and, like all scholarly fields, to generate new knowledge, and the aim of design practice is to design effective technology to deliver a better user experience. As Carroll (1991, p. 9) notes, “one of the most significant achievements of HCI is its evolving model of the integration of research and practice.”

Understanding the influence of technology on people’s values, thoughts, emotions, and behaviors, and then using this information to inform interactive technology design is one main foci of HCI. Designing interfaces that would enrich human motivation, action, and experience

led to the development of User Experience, or UX. The term User Experience (UX), coined by Don Norman in 1995, is concerned with “all aspects of the person’s experience with the system including industrial design graphics, the interface, the physical interaction and the manual.” Dix (2009, p. 1327) defines UX as “the way people feel about the system as they use it.”<sup>1</sup>

As technology advances, there are more opportunities to design interactive technologies in various domains and activities. Technology is no longer merely a tool it has fundamentally changed the way we communicate, learn, travel, and live. Technological progress impacts us as individuals and as societies. As Mazlish (1995) states, we are not so separate from technology. As technology develops, our expectations of technology evolve. We shape technology, and technology shapes us; this recursive relationship has led us to coevolve over time.

In recent years, interaction design has become a very popular branch of HCI. Winograd (1997, p. 155) defines interaction design as, “the design of spaces for human communication and interaction.” Rogers (2004, p. 90) updated the definition to recognize its prolific presence: “the design of interactive products to support people in their everyday and working lives.”

Design practitioners and researchers have become more attentive to understanding and incorporating affect to help them design interactive technology and deliver a better user experience. Empathy is one example of an affective issue (Wright & McCarthy, 2008; Koskinen et al., 2003); others include aesthetics (Peterson, et al., 2004), and enchantment (McCarthy et al., 2006).

For example, Wright & McCarthy (2008) emphasize incorporating empathic understanding of user experience. The authors highlight the use of empathy “to understand the relationship between user and designer and to reflect on experience-centered design methods with a view to understanding how they mediate that relationship.”

Petersen et al. (2004) build on the idea that to meet the needs and desires of interactive technology users, designers need to go beyond functionality and efficiency, and integrate aesthetic needs. The authors develop a theoretical foundation to incorporate mind, body, and the sociocultural context of people’s everyday lives into the design of Aesthetic Interactions.

HCI researchers have also identified enchantment as another form of affect. McCarthy et al. (2006) argue that enchantment is “a useful concept to facilitate closer relationships between

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<sup>1</sup> Accessed via [https://link.springer.com/referenceworkentry/10.1007%2F978-0-387-39940-9\\_192](https://link.springer.com/referenceworkentry/10.1007%2F978-0-387-39940-9_192), Feb 12, 2017

people and technology.” Building on an anthropological definition (Gell, 1992), which they describe as being carried away by the power behind technology, the authors explore how enchantment has been used in the design of interactive systems like film and cellphones. The authors identify four sensibilities that can produce enchantment, (the specific sensuousness of a thing, senses of play, paradox and openness, and the potential for transformation), and conclude that interactive systems require depth to support lasting enchantment.

These examples, coupled with the significant role of interactive technology in our lives, illustrates the importance of using affect to gain a deeper understanding of social sciences, psychology, and HCI. Understanding affect may help interaction designers achieve more clarity about the relationship between theory and design practice, which in turn can be used to address the complex needs of humans, both as individuals and as a society.

Theory is discussed in two broad ways in HCI. One argument is that the development of foundational theories helps structure and guide HCI as a new discipline and make the field more coherent. These types of theories are meant to play a role similar to those in other disciplines, such as science and sociology. A number of scholars point out to the limited number of theories in HCI. Carroll and Campbell (1989) argue, “explicit theory is currently scarce in HCI.” Also, McCarthy et al. (2006) indicate that, “[o]ne way of working with the richness and complexity of user experience in HCI is to develop conceptual frameworks for design and analysis that attempt to express aspects of it.” Furthermore, Carroll (2003) indicates,

“The phenomena underlying the relationship between people and technology are complex and varied. Understanding these phenomena is a real challenge, especially given that they span perceptual, cognitive, social, organizational, commercial, and cultural factors. Practitioners in HCI disciplines (interaction designers, information architects, usability testers, ethnographic field investigators, etc.) offer skills, methods, and practices to design and evaluate these technologies. Researchers in HCI provide innovations and empirical groundings, as well as theoretical perspectives, which are critical for a robust field. But the theoretical work is scattered across many sources, and practitioners are largely unaware of the range of theoretical work that has been done.”

Yvonne Rogers (2004) argues that the gap between theoretical research and interaction design has divided scholars in the field on whether and how theory can contribute to the design of new

technologies. Rogers (2004, p. 90) highlights that while one group of scholars strongly advocates the need for theoretical foundations to address difficult challenges facing the HCI community, others believe that theory “has never been useful for the practical concerns of HCI and that it should be abandoned in favor of continuing to develop more empirically based methods to deal with the uncertain demands of designing quite different user experiences applying innovative technologies.”

The second approach to theory in HCI involves bringing theories from other disciplines, which has a long tradition in the field. Theories have been brought into HCI from fields such as cognitive science, computer science, as well as psychology and sociology. Examples of these theories are Activity Theory by Leontiev (1978) from soviet psychology, Distributed Cognition by Hutchins (1995) from cognitive science, Situated Action by Suchman (1987) from cultural anthropology.

Although there are merits in theory development, the focus of this dissertation is to import theories from other disciplines to apply to interaction design. A number of theories have been developed in psychology, sociology, and other humanities fields as an attempt to explain various aspects of human emotions, behaviors, and values, which lend a set of guiding principles. Considering the technological interventions in humans’ everyday interactions, these theories can potentially inform the design and evaluation of various technologies especially the design of technology interventions.

It is important for design practitioners to deepen their understanding of the relationship between people, technology, and the phenomena they would like to influence. This issue is particularly important in design of health-related technology. For example, Elwyn et al. (2011) discuss the lack of theory in the design of decision support interventions for patients. The authors argue about the importance of using theory to guide design and call for more work that incorporates theoretical foundations for the design of such intervention technologies.

However, not all attempts of using theories from other disciplines in interaction design have been successful. Yvonne Rogers (2004) presents examples of early attempts for applying cognitive theory to the design of interactive systems, such as text-editing tools, and discusses the theory’s ineffectiveness in the context of designing interactive systems. Rogers argues that incorporating theories from other domains is not as simple as lifting them “out of an established field,” such as cognitive psychology, and then using them to “explain other kinds of seemingly

related phenomena in a different domain,” such as interaction design. Rogers points out the differences between theories that are based on controlled tests in laboratories and other similar settings versus what happens in the “real” world of HCI, which is “messier” and less predictable (p. 91-92)

Rogers provides an analysis of why theories imported from cognitive psychology were not widely used in computer science, arguing the theories are too low level, restricted in scope, and unable to deal with real-world contexts. She adds that while researchers agree that theory plays a valuable role in “helping to conceptualize the field,” they want new theories that are “more encompassing, addressing more directly the issue of interacting with computers in real world contexts” (p. 97)

Rogers further analyses other theories brought to HCI, including Activity Theory, theories of ecological psychology, and various cognitive theories, to show that very few design practitioners use these theories in their interaction design projects. She also presents examples of more successful uses of theory in interaction design, such as the expansive use of Miller’s (1956) memory theory, which posits that short-term memory can hold only five to nine pieces of information at any one time. While most designers are aware of this theory and use it in their designs, Rogers argues that the theory is taken out of the context and often times not used appropriately. Rogers indicates that the seven plus or minus two “has become a catchphrase, open to interpretation in all sorts of ways, often far removed from the original idea underlying the research finding” (p. 96)

However, John Carroll (1991) highlights the important role psychological perspectives can play in HCI because they are focused on human motivation, action, and experience. But Carroll argues, “[t]he most sustained, focused, and sophisticated attempts to develop explicit extension of academic psychology for HCI have had no impact on the design practice.” At the same time, Carroll points out that “some of the most seminal and momentous user interface design work of the past 25 years made no explicit use of psychology at all” (p. 1).

Carroll acknowledges that basic science usually does not provide direct support to applied work, yet he calls for more investigation for why there is a “haphazard” and “schismatic” relation between science and application. Carroll emphasizes the importance of understanding “how we do what we do in design, so that we can do it deliberately and repeatedly in diverse and novel situation” (p. 2)

Rogers' (2004) analysis of the use of seven theories in HCI shows a difference between how theory was used in earlier days of HCI versus its use in more recent applications. Previously, theory was used in three different ways:

1. Informative, where theory provides useful research findings.
2. Predictive, where theory provides tools to model user behavior.
3. Prescriptive, where theory provides advice on how to design or evaluate.

Rogers added that the value of these early attempts was very limited, such that these attempts could not match or scale up to “the demands and perceived needs of emerging systems” (p. 96). Discussion around the inefficiency of using theory in design in early 1980s led to a more diverse presence of theory in HCI in recent years:

1. Theory provides descriptive accounts and rich descriptions.
2. Theory is more explanatory and accounts for user behavior.
3. Theory provides analytic frameworks, as high-level conceptual tools for identifying problems and modeling certain kinds of user interactions.
4. Theory is formative and provides a lingua franca, a set of easy-to-use concepts for discussing design.
5. Theory is generative and provides design dimensions and constructs to inform the design and selection of interactive representations.

These newer attempts toward more analytic and generative approaches led to significant contributions in HCI such as providing “more extensive and often illuminating accounts of phenomena in the field” (p. 127). These new approaches also highlighted the importance of considering social context and external environments, as opposed to limited cognitive theories that focused on single users. These contributions provided new ways to examine how technology is being used in different contexts.

It is important to add that Rogers' analysis includes all the ways theory can be used in HCI, encompassing both theoretical approaches that are imported to HCI and theories developed for HCI. As mentioned earlier, the focus of this dissertation is to apply established theories to the process of designing interactive systems.

While the HCI literature discusses the importance of integrating theory into design and although HCI, as a multidisciplinary field, has attracted various theories and practices from other disciplines, my search suggests that very few interaction design projects make explicit use of theory.

To investigate how theory is utilized or discussed in the design of interactive technologies in HCI literature, I took the following strategies:

#### 1- Search the literature.

My goal was to gain a better understanding of the landscape of the literature, something that did not require a comprehensive search of all papers in the HCI domain. Initially, I searched for papers in Google Scholar search engine (<http://scholar.google.com>) for instances of the following terms: design, theory, HCI, technology, role of theory in design, theory driven design, lack of theory in design, lack of theory in user experience, lack of theory in HCI, theory-practice gap, design-practice gap, research-practice gap, and theoretical design. I acknowledge that using a keyword-based search approach can overlook some literature that uses theory. However, this method helped in gaining a better sense of the landscape.

While I found some examples of use of theory in design generally, HCI is not full of such explicit examples. The literature suggests that HCI researchers and practitioners do not necessarily discount theory-based design, but they do not actively employ it. However, if designers who are not familiar with theory try to gain guidance of using theory in design, it is very likely that they will not succeed. I will discuss the different ways that theory manifests in the HCI literature in the upcoming section.

#### 2- Contact scholars

I contacted faculty members in HCI programs, including Human Centered Design & Engineering (HCDE) program at the University of Washington, HCI Institute and School of Design at Carnegie Mellon University, and Human-Centered Computing program at Georgia Tech. Scholars at these institutions explicitly noted the lack of theory in design and stated that most design practitioners do not use theory, so finding literature that discuss what is not happening would be challenging.

### 3- Discussions with design practitioners

I contacted design practitioners regarding their use of theory in the design of interactive technologies. The design practitioners said that they do not take theory into consideration, but likely practice it subconsciously. In other words, they might have studied or read about certain theories and employed them in their designs without realizing it. They also talked about inventing new methods to help understand various human-related issues, such as ideation or various IDEO methods.

I also searched the internet to explore other designers' perspectives on this matter. There are several posts, comments, and forums that mention the connection between theory and design in various ways, including Erik Stolterman's blog (2016), but I found a quote from designer Karim Rashid<sup>2</sup> to conclude the online search. He said, "I was a full-time professor for 10 years in design, and my greatest disappointment was the lack of theory and study of the world's bigger issues," He added, "Design is a political act, a creative act and a social act. The more one is informed of the world, the better one is a designer."

Even though my discussions with design practitioners were not conducted in a formal and systematic way, my observations resonate with Rogers' (2004) survey of 34 practitioners (such as interaction designers and usability practitioners) regarding their thoughts about the need for theory in their work and on the role of theory in HCI. When Rogers asked these practitioners "what they used to interpret their findings [from gathering information and requirements for their projects]," 85 percent of them said, "they relied mainly on their own intuition and experience" (p. 123).

In addition, while the majority of practitioners in Rogers' survey claimed that they were familiar with most of the theories presented in the survey (ecological approach, activity theory, external cognition, distributed cognition, ethnomethodology, situated action, information foraging, and systems of interaction), only a few of them said they used theory, and they did so only "sporadically." Practitioners who did use theory said that they used their own adaptations, distributed cognition, or grounded theory in their design.

Rogers (2004) highlights the "gap between the demands of doing design and the way theory is conceptualized" as part of the reasons for the non-use of theory by these practitioners. One

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<sup>2</sup> International Interior Design Association (IIDA), Accessed via <http://www.iida.org/content.cfm/crossroads> - Article by Ross Foti, Feb 10, 2017

of the practitioners in Rogers' survey said, "most current HCI theory is difficult for designers to use and generally too theoretical to be relevant to a practical human focused solution developed in the timeframe of a design project" (p. 123).

### **Search results and analysis**

As discussed earlier, I conducted a literature search to better understand the role of theory in design in HCI scholarship. My goal was not to be comprehensive by identifying all the papers in HCI domain, but rather to gain a better understanding of the landscape. I will discuss this literature search further in the future direction section of Chapter 7. I looked for papers that involved theory and design of interactive technologies without limiting my search to any particular domains. My goal was to learn whether theory had informed a project's design and how theoretically oriented the design was. I did not aim to be comprehensive, but rather I paid particular attention to the theories used and the relevance of the design project described in the paper. More specifically, I read the papers looking to answer the following questions:

(1) What theory(ies) are considered?

I read and analyzed each paper to determine the scope of use of theory in design. I also used the search function in a standard PDF document reader for the word "theor-". Using the fragment form of the word allowed me to capture all uses of the words relating to theory including; theoretical, theories, theorize.

This search functionality was particularly useful in finding theories in the reference section of the paper. The rationale for the search was that these theories might have been informed the design but not mentioned in the body of the paper. An interesting observation was that there were very few papers that actually used the word theory in the body of the paper even if the theory was used.

(2) Is the theory being applied or merely discussed?

To further broaden my understanding of the way theory was mentioned in the literature, I reviewed whether theory was operationalized in each publication.

(3) How does the theory impact design features or design processes?

A design might be inspired or informed by theory or might be structured around a theory. In each publication, I reviewed whether design features or processes were influenced by theory.

(4) Did the author(s) reflect on using theory in design and its potential benefits?

If the author(s) applied theory to design, did they provide any arguments for or against using theory in design?

My search showed that theory manifests in design in HCI field in various ways. Here, I group the findings into two broad categories and describe what each category entails: (I) Theory mentioned in publications, and (II) Theory not mentioned in publications. I determined the degree to which theory is discussed in each publication and provided examples.

(I) Theory mentioned: This category includes all publications that mention theory in any scale. Below, I describe the scale of specificity in which theory manifests in the publications in HCI.

(1) Theory explicitly named and definitively used. The connection between theory and interaction design is articulated.

The number of publications in this category was very limited, which suggests that this is the least common way of using theory in design in the field of HCI. The rarity of publications in this category supports the discussions I had with the design practitioners regarding their use of theory in design, as well as Carroll and Campbell's (1989) statement on the scarcity of explicit theory in HCI. In addition, very few publications use theory as a basis for planning design strategies or inspiring of specific design ideas. However, the publications extensively discuss theory and its components, in addition to the implications of using theory in design of technologies.

An example of a publication that explicitly names and applies theory in design is Bodker's (1989) use of Activity Theory in the design of user interfaces for computer-based artifacts. Bodker's attempt at using Activity Theory in 1989 was one of the first applications of Activity Theory in the field.

Another more recent example in this category is the design of health technologies for low-income African-American communities by Grimes and Grinter (2007). The authors draw on various aspects of social psychological theories of persuasion and illustrate how they can be incorporated into the development of new technology.

- (2) Theory explicitly named but amorously used. In this category, authors explicitly name a theory, but do not articulate the connection between design and theory. Below are two examples of the publications in this category:

Trace is “a mobile mapping application that generates walking routes based on digital sketches people create and annotate without a map” (Rosner et al., 2015). Rosner and colleagues offer a different perspective on designing for Geographical Information Systems (GIS) by introducing a new digital communication method based on drawing. The authors employ literature from various fields, including art, sociology, social mapping, and algorithmic life to discuss their design rationales and strategies. The authors explicitly name the theory of *Dérive* and provide examples of the projects that extended or built on that or other unnamed theories, but they do not articulate how these theories connect to the design of Trace. However, the authors highlight the theory’s emphasis on “playful-constructive behavior,” which is apparent in the design of Trace.

Theory explicitly named but not used. Publications in this category usually name one or more theories, but they never discuss how the theory was used and perhaps only very knowledgeable readers might be able to discern the connection between the named theory and design.

Pensive is a tool that supports “everyday, spontaneous, individual reminiscing through memory triggers—e-mailed reminders that contain snippets from content one has previously created in social media or generic questions that encourage people to reflect on their past” (Cosley et al., 2012). Multiple conference and journal articles are published about the design and use of Pensive. In this dissertation, I refer to one article that provides a thorough description of the project and the methodologies used to design Pensive. Here, Cosley and his colleagues mention theories of reflection and reminiscence, but they fail to provide details of how these theories were applied to the design of Pensive. The authors point out to an aspect of the reflection theory, “making sense of unstructured content is one way that reflection has been defined.” This aspect of the theory might help knowledgeable readers discern the connection between the theory and the design because Pensive uses unstructured data from sources such as email and social media sites, but this connection is not explicitly articulated.

- (3) Theory implicit or inferred. Readers can discern the connection between the theory and design, even though the connection is not articulated in the publication. There was an abundance of publications that fell into this category, especially pertaining to the topic of behavioral change, such as the design of Eco-Feedback displays for water usage (Grimes, 2008) and EatWell (Froehlich et al., 2012).

One paper by Hallnäs and Redström (2001) discusses the design of Soniture and Informative Art. In this paper, the authors introduce a new design agenda “for technology aimed at reflection and moments of mental rest rather than efficiency in performance.” By introducing Soniture and informative art, the authors discuss how the slow technology design principles can be applied in practice. For readers familiar with reflection theories, the slow technology’s links to the principles of reflection is salient throughout the paper. The use of words such as “reflective technology” and “reflective environments” signal a connection to theory. An interesting observation is that by using the search function, the word “theory” is used only once as a general term, rather than referring to any specific theory, principle, or conceptual framework.

(II) Theory not mentioned in publications:

- (4) Theory not explicit or implicit.

This category includes papers that did not name or refer to any theories that might have been used to design technologies. The publications in this category mainly map with Carroll and Campbell’s (1989) work on “Artifacts as psychological theories.” The authors argue that by looking at a design of an artifact, we can make some inferences about who the users are, what motivates the users, and the users’ capabilities. In other words, an artifact is the instantiation of the designers’ theories, because artifacts incorporate assumptions and their suitability for the tasks users want to do. The authors add that the design and evaluation of artifacts in HCI “inherently and inextricably involve psychological issues”; however, the research issues “are often articulated and systematically studied only *after* they have already been codified in a running system.” Carroll and Campbell consider this way of viewing artifacts and their function “novel” because “[s]cience is not generally viewed as producing artifacts; nor are artifacts regarded as theory-like, as embodying implicit theories or taking over some of the functions of theory.”

This perspective in design of artifacts is particularly important because, as Carroll (2003) indicates, the *rationale* behind designing a computer system, such as the motivation that initiated the design and the reasons for its particular features, can contribute to theory development in HCI. As Carroll mentions, HCI “has served as a laboratory and incubator for theory.”

Based on Carroll and Campbell’s perspective, this category was the most common type of the use of theory in design. In other words, any publication that discusses the design of an artifact falls into this category. An example of one such publication is, “SenseCam: A Retrospective Memory Aid” (Hodges et al., 2006). The paper presents the design of “a sensor augmented wearable stills camera” called Sensecam, which functions as a memory aid that captures and records a series of images from the life of the person wearing it. Even though the authors do not name or imply theories related to cognition, self, reminiscence, or reflection, these notions seem to be used to motivate the design effort and the camera features. For example, the authors stated, “a memory of past experiences is critical to a patient’s ‘self concept’ or “[...] without a memory of shared experiences it is very hard to maintain any kind of relationship, whether it is professional, social or personal. This, in turn frequently affects the patient’s self-esteem, which can have significant knock on effects on their well-being” These statements link to theories, such as cognitive theory, that explain human behavior by understanding subjects’ thought processes or various theories of self-esteem.

According to Rogers (2004), bringing theory into HCI has not had much of an impact on the process of interaction design because (a) “it is foolish to assume or hope that theories do design,” (b) more time is needed to allow a complete theory/design cycle to mature, and (c) considerable time, effort, and skills are required to understand and use the theoretical approaches.

Rogers supports using theories only in relation to current design practices because theory cannot provide prescriptive guidance for designers. Using an example of the amount of time it took for GOMS (Goals, Operators, Methods, and Selection) value to be realized in the design of computerized systems, Rogers encourages case study approaches to help designers see how theoretical approaches can apply to their design practice.

While there is a large body of literature on the importance of theory in HCI, it is not clear where the disconnect between theory and design happens. Is there a need to set standards for the design of certain interactive technology? Are certain steps necessary for developing theoretical foundations for design? What are the reasons for designers to *not* use theories in their work? And how can we obtain the buy-in of designers into using theory? I will discuss theory-design issues in more detail in subsequent chapters.

## **Section B – Travel, solo travel, and technology**

Since the early days of travel industry, travel has been influenced by technological advancement, for example who could travel, where one could travel, and how far and fast one could travel. The railroad, the steamship, and the airplane helped humans overcome the physical limitations to travel, while mobile and networked technologies have assisted to transcend barriers and connect people to the world in ways previous generations never thought possible. As Hannam et al. (2006) indicate, “There is increasing convergence between transport and communication, ‘mobilizing’ the requirements and characteristics of co-presence into a new kind of mobility nexus.”

Network technology plays an important role in the travel industry. Obtaining and retaining access to the internet and mobile technologies has become an essential part of travel and as technologies become increasingly personal and portable, more and more travelers engage with technology in nearly every context and at every moment of their travels.

The travel and tourism industry is one of the largest and most dynamic industries in today’s global economy, and solo travel is the fastest growing segment of this industry, particularly in postindustrial societies (ITB World Travel Trends Report, 2015/2016<sup>3</sup>). The growth in solo travel is in concert with the growing trend of activities such as dining out, theatre performance that are increasingly being enjoyed alone rather than in the company of others (Jordan & Gibson, 2005; Newman, 2010). Solo travel involves various technologically mediated interactions through mobile and networked tools that can keep these individuals connected to home and others. In addition, several solo travelers utilize technology to perform work-related tasks while on the go. Interactive practices and collaborations with a diverse group of people through networked technologies demonstrate solo travel is embedded in a more complex

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<sup>3</sup> Accessed via [www.messe-berlin.de](http://www.messe-berlin.de), Feb 28, 2017

context. It also raises the question of whether these individuals are really solo while being connected to and interacting with family and others.

Travel and tourism is a significant economic activity in many countries including the U.S. According to the World Travel & Tourism Council (WTTC), the total contribution of Travel & Tourism to GDP in the U.S. in 2015 was USD1,469.9bn (8.2% of GDP), and is forecast to rise by 3.0% in 2016, and to rise by 3.4% pa to USD2,118.6bn (9.3% of GDP) in 2026.

Among American first time travelers, the popularity of solo travel grew from 16% in 2013 to 37% in 2015 (Visa study, 2015) and among affluent travelers (Brown, 2015), (also see Appendix L), it was 32% up from 14%. Among American individuals 45 years and older, 18% traveled solo in 2015; up from 16% in 2013 (AARP).

In a 2015 travel intentions study conducted in 25 countries across the world including the US, 1-in-5 participants have traveled solo on their most recent leisure trip and the percentage of solo travelers increased from 15% in 2013 to 24% in 2015 (Brown, 2015).

Additionally, long-haul leisure travel is growing faster than short-haul travel, with the US being the largest long-haul source market where the number of trips longer than four nights increased by 8% in 2014 (IPK International, Travel Monitor Reports, 2015<sup>4</sup>).

This upward trend in leisure travel is particularly interesting because the world travel has faced many challenges in recent years such as war, violence, and political unrest in various destinations, as well as Ebola outbreak in several West African countries. The fact that these political and economic highs-and-lows and other issues have not led to a breakdown in global travel suggest that the urge to travel and explore is strong within many and, given the opportunity, people will enthusiastically embark on adventures and new experiences.

While the concept of solo travel has been around for many years, the accessibility of solo travel appears to be new. Solo travel is accessible to a wide range of individuals; men and women, people of all ages, those married and single, and those with and without children (Brown, 2015; Google Travel, 2015; AARP, 2015).

Although there is little research available on how solo travelers use technology, statistics confirm American travelers' heavy reliance on the use of technology. Travel aspirants read blog posts and

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<sup>4</sup> Accessed via <http://www.ipkinternational.com/en/world-travel-monitorrr/travel-monitor-reports>, Jan, 12<sup>th</sup>, 2016

comments, ask questions in various online travel forums, and watch online videos before committing to a trip. However, it is unclear how having access to vast amount of information and reading other travelers' experiences impacts one's motivation for those traveling solo or their overall travel experience. Travelers reflect on their trip and share their takeaways with others through weblogs or on social media and they seem to enjoy receiving validation and feedback regarding their adventures. These responses may potentially lead to a desire to travel more or a desire to travel to more interesting destinations and having authentic experiences to receive even stronger positive reactions.

The increased accessibility of solo travel may be a development of shifts in social structures and lifestyle pattern especially in postmodern or postindustrial societies. Despite the potentially intriguing nature of this situation, there is limited research on solo travel (and travel in general) in design-oriented communities. Experience related research in travel is under-represented in the literature (Ritchie et al., 2011) and there is little known about (a) the sociotechnical practices of solo travelers and possible influences of these practices on the emergence of solo travelers, and (b) the affordances of technologies that support solo travel experience.

Understanding how travelers adapt to technological changes is essential because technological development is driven by travelers' needs and wants. As Xiang et al. (2015) indicate, there is a "dialectic relationship within and between the sociotechnical systems wherein actors in these systems influence each other, which ultimately lead to changes in the structure of the system itself."

In addition, solo travel is a practice that has many of the characteristics of postmodernity such as high mobility, globalization, abrupt social relationships, and appraising visuals. Postmodern individuals employ practices such as reflexivity, identity making, and meaning making in order to better understand and justify their existence (Giddens, 2002; Gergen, 1991). The growth in solo travel indicates broader social changes and my attempt at understanding solo travel sociality may lead to a better understanding of our present and future, and open up new ways of designing for the future of work.

By understanding the sociotechnical practices of solo travelers and their specific challenges and needs as an emerging sociality, we can incorporate solutions in their products and tools to support their experiences. Focusing on the convergence of solo travel and sociotechnical

practices may also provide insights into new ways of performing certain forms of complex collaboration or sociality.

Also, as people become more mobile, especially in post industrial and modern societies, designing for people on the go becomes more important. Daily commutes, weekend getaways, and short-and-long term travels have become more accessible as a result of technological advancements and thus there is more demand for designing for on the go.

Despite the plethora of tools to help travelers gather information, choose destination, book and purchase different services and products, and share photos and travel stories, there are few tools to support their travel experience beyond the necessities. Technology has moved on from being just a tool in our lives and has impacted and shaped travel in various ways. Social interactions mediated by technologies are intertwined with everyday travel practices and I believe designers can create experiences that offer greater value for travelers.

### **The Solo traveler**

Travelers are grouped into various categories by different sources. They are called tourists, individual mass-tourists and organized mass-tourists, explorers, drifters (Cohen, 1960), backpackers, flashpackers, free spirit, experiencer, and more. Likewise, there are various definitions for each of these terms and, often times, the definitions change as the travel industry evolves. For example, flashpacker is a relatively new term created to describe backpackers that carry electronic devices such as laptops, tablets, and smartphones in their backpacks while traveling. The term also means to describe the wealthier group of young travelers that travel with style.<sup>5</sup> The emergence of this term is mostly to differentiate between budget backpackers and more affluent backpackers. A search for flashpacker in Google returns over 370,000 results (Dec 20, 2016) that indicate the wide adoption of the term.

Even though there is not an agreed upon and a standard set of definitions for various types of travelers, some scholars who have studied travel and tourism as a social phenomenon, created typologies for travelers based on different concepts (Cohen, 1960).

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<sup>5</sup> Hannam, K., & Diekmann, A. (2010). From backpacking to flashpacking: Developments in backpacker tourism research. *Beyond backpacker tourism: Mobilities and experiences*, 1-7.

To help understand the definition of solo traveler and provide some context, I use Erik Cohen's (1960) typology of tourist roles as one of the more adopted categories. According to him, there are four types of tourist roles:

1- The organized mass tourist, is "the least adventurous and remains largely confined to his "environmental bubble" throughout his trip. [...] This tourist type buys a package-tour as if it were just another commodity in the modern mass market. The itinerary of his trip is fixed in advance, and [...] and stays almost exclusively in the microenvironment of his home country. Familiarity is at a maximum, novelty at a minimum.

2- The individual mass tourist, is similar to the previous group except that the tourist has a little flexibility and control over his time and itinerary. While he also experiences the travel within his "environmental bubble," he ventures out into "into well-charted territory." Familiarity is less dominant than previous type and the experience of novelty is somewhat greater.

Cohen called the first two types of tourists roles institutionalized tourist roles.

3- The explorer, who plans his trip alone and tries to get off the beaten track, "but he looks for comfortable accommodations and reliable means of transportation. He tries to associate with the people he visits and to speak their language. The explorer dares to leave his "environmental bubble" much more than the previous two types, but he is still careful to be able to step back into it when the going becomes too rough. Though novelty dominates, the tourist does not immerse himself completely in his host society, but retains some of the basic routines and comforts of his native way of life."

4- The drifter, ventures furthest away from the beaten track and from the accustomed ways of life of his home country. He shuns any kind of connection with the tourist establishment, and considers the ordinary tourist experience phony. He tends to make it wholly on his own, living with the people and often taking odd jobs to keep himself going. He tries to live the way the people he visits live, and to share their shelter, foods, and habits, keeping only the most basic and essential of his old customs. The drifter has no fixed itinerary or timetable and no well-defined goals of travel. He is almost wholly immersed in his host culture. Novelty is at its highest and familiarity is not important.

Cohen called the second two types of tourist roles, non-institutionalized roles. He later develops the fourth type of tourist role even further because of how it grew from a small number of tourists to a growing mass.

Backpackers are mostly defined as long-haul independent pleasure travelers who plan their entire trip and tend to keep a flexible itinerary (O'Reilly, 2006—from drifter to gap year; Sørensen, 2003—backpacker ethnography, Bhattacharyya 1997; Cohen 1989 Primitive and Remote & Nomads from Affluence; Smith 1994; Turner and Ash 1975; Uriely and Reichel 2000)

In this dissertation, solo travel simply means traveling alone. It is very likely for solo travelers to meet locals or other travelers and enjoy part of their trips with their company. It is important to differentiate between solo travelers and backpackers, flashpackers, budget travelers, drifters and explorers. Several studies agree that backpackers and budget travelers consist of young individuals in their 20s or early 30s, they are mainly single and have no children, they do not have specific intentions to travel solo and in many cases seek companionship. Backpackers and budget travelers stay in hostels and enjoy traveling in groups. They do not necessarily travel for an extended period and they think of travel more as a temporary get away (e.g., Anderskov, 2002; Molz & Paris, 2015). Solo travelers, on the other hand, have specific intentions to go alone, they range in age from early 20s to early 70s (all ages), many are married and have children, they enjoy long-haul travel and some of them has given up their permanent housing to live a nomadic life.

In a 2015 travel intentions study conducted in 25 countries across the world including the US, 1-in-5 participants have traveled solo on their most recent leisure trip and the percentage of solo travelers increased from 15% in 2013 to 24% in 2015 (Brown, 2015).

Among American first time travelers, the popularity of solo travel grew from 16% in 2013 to 37% in 2015 and among affluent travelers, it was 32% up from 14%. Among American individuals 45 and above, 18% traveled solo in 2015; up from 16% in 2013 and among these individuals, 53% were married while 39% are single or divorced (AARP, 2015).

### **Sociotechnical Practices**

In this work, I use Sawyer and Jarrahi's (2014) definition of sociotechnical, which they conceptualize as, "the mutual constitution of people and technology" (p. 1), a phenomena that

emerges when social systems and technological systems emerge. The authors situate the sociotechnical premise in the study of information systems and offer the following articulation:

1. The mutual constitution of people and technologies, specifically digital technologies. Mutual constitution implies that (a) both humans and technologies may have agency in a given situation, and (b) these actions are not independent of surrounding events. The principle of mutual constitution speaks directly to the complex and dynamic interactions among technological capacities, social histories, situated context, human choices and action rather than looking for simplified causal agency.
2. The contextual embeddedness of this mutuality. This means all technologies are socially situated and embedded into a social context that both adapt to and shapes social world.
3. The importance of collective action - refers to pursuit of goals by two or more actors.

The internet and digital technologies play different roles throughout travel. Here, I divide the use of technology and internet into three separate but interrelated stages. Together, they build a framework that illustrates travelers' sociotechnical practices.

**a. Pre-travel (inspiration and research)**

Google travel study (2015) shows that 74% of US travelers begin researching online prior to making any travel decisions. Among these individuals, 83% rely on social networking, video, or photo sites for inspiration and 94% booked with an Online Travel Agency (OTA). There are limited statistics available on US solo travelers. However, among world solo travelers, 64% used their mobile devices for trip planning in 2015 compared to 42% in 2013 (Visa, 2015).

Social networks, video, or photo sites play a key role in the travel-planning phase. Travel aspirants read comments and blog posts; and post their questions in various online travel forums such as TripAdvisor and Reddit, and weblogs before they decide where or how they want to travel. Sixty two percent of US travel aspirants ask friends, family, and colleagues, either offline or online, for travel planning.

**b. During Travel (experiencing, traveling)**

The rapidly growing adoption of the internet and mobile technologies globally enables travelers to stay connected with home through social media, email, blogs, or services such as Skype. Studies show that the increased use of the internet has profoundly impacted the way travelers

search for information because travelers now look for information about a particular destination during their trip rather than in pre-travel planning stage (Brown, 2015; Google Travel, 2015).

Research shows that because of the ubiquity of the internet and access to the social world, the traditional views of a rigid trip planning process has become much more open, fluid, and fragmented (Zins, 2009). Ninety one percent of the U.S. travelers rely on smartphones and 46% use laptops once they are on their trips and at their destinations to gain information about the destination they are at and to decide on activities. Also, 70% of US travelers share their experiences with others on social media and post or read reviews.

### **c. Post Travel**

Sociotechnical practices at this stage include processing and sharing photos, posting blogs and reviews, sharing travel stories, and reflecting on their travel experience. Travelers also seem to enjoy receiving validation and feedback regarding their adventures. Instagram and Facebook “likes” combined with congratulatory notice or comments could enhance self-image and may actually provide an impetus to travel more often.



## Chapter 3. Methodology & Methods

This dissertation undertook an empirical investigation to explore the role of theory and scholarly research in the design of interactive systems. This chapter describes the methods in three sections. Section A is focused on methodologies of collecting and handling data, Section B is focused on the data analysis rigor, and Section C is focused on the methods used in 3 design projects to connect scholarly research to design.

### Section A - Data Collection Methodology

In this section, I provide a detailed description of the research methods for exploring solo travelers' sociotechnical practices, participants' demographics, data collection techniques, and data analysis methods.

Solo travel involves various technologically mediated interactions through mobile and networked tools. Solo travelers employ various sociotechnical practices, such as blogging, watching and uploading travel videos, taking and sharing photos, connecting to social networking sites, and connecting to people via services such as Couchsurfing and Airbnb. However, as discussed in Chapter 2, there is limited research available on solo travel, especially in the design-oriented communities. Exploring the technological and social affordances of solo travel could potentially lead to identifying design patterns that can be applied in the design of novel, interactive technology.

According to Corbin and Strauss (1990), methodology is a way of thinking about studying social phenomena. I chose a qualitative methodology to (a) understand solo travel experience as perceived by the individual travelers who have gone on a long-term travel, (b) examine their motivations for traveling solo, (c) investigate solo travelers' use of technology, and (d) study the role of digital tools in their travel. In this research, I draw on Corbin and Strauss' (1990) definition of qualitative analysis as a process of examining and interpreting data in order to elicit meaning, gain understanding, and develop empirical knowledge. A qualitative approach is useful to gain insight into behaviors, concerns, and attitudes that may not be obtainable by other methodologies—such as quantitative analysis (Riley & Love, 2000). This research included several qualitative research methods that are described in detail below.

I conducted 26 formal, in-depth, and non-structured interviews, which form the basis of this analysis. I have also observed and followed 38 solo travelers' weblogs, including weblogs of the

participants in the study. In addition, in July 2015, I participated and volunteered in a major annual gathering of travel enthusiasts in Portland, Oregon. This event is called World Domination Summit (WDS) and attracted around 5000 people in their fifth year. Volunteering for the event allowed me to have several informal interviews, which manifested as extended conversations, with travelers. I also participated in several meet ups that were organized around the topics of travel and technology during this event.

Finally, I participated in travel events organized by the Wide World Books and Maps in Seattle. At these events, travelers share their travel experiences and have casual conversations with others and share wisdom on the road. The Wide World Books and Maps organizes specific events for solo travelers once a month. Attending these gatherings provided me with a deeper understanding of the solo travel subculture that complemented my online interactions and my own personal experiences as a solo traveler.

### **Participant<sup>6</sup> recruitment and demographics**

My goal in recruiting participants was to “develop a wide-ranging panel of *knowledgeable informants*” (Weiss, 1995, p. 17), so I searched for solo travelers who could significantly instruct my study. Initially, I looked for participants based on two broad criteria: (a) individuals who traveled solo for three or more days since 2009 or had a definite plan to travel solo for three or more days by July 2015, and (b) individuals whose purpose of travel was personal reasons, such as recreation and leisure—not work or school related. The rationale for recruiting participants who traveled since 2009 was because of rapid changes in technology, especially mobile technologies. Several new technology developments, both hardware and software, did not exist prior to 2009. For example, the online mobile photo sharing service, Instagram, widely used by travelers, started in 2010, and at the same time, smartphones were new to the market; the first iPhone was introduced in late 2007. Recruiting from the pool of recent solo travelers provided a way to study individuals with comparable experience in terms of technology use, which is the focus of this research. Participants were all English-speaking Americans.

Within these two criteria, I employed a purposeful sampling method (Patton, 1990) to achieve “representativeness or typicality” (Maxwell, 2012, p. 89) of the individuals and activities in this

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<sup>6</sup> I use the word “participants” for solo travelers in this study to reflect the active stance they took in reconstructing their solo travel experience. The word captures both the sense of active involvement that occurs in an in-depth interview and the sense of equity that I’d tried to build in the interviews.

study. The purposeful sampling method provided a structure to select participants. Between the summer of 2014 and the fall of 2015, I recruited two groups of solo travelers:

(1) Students who won a highly regarded travel fellowship that required them to travel solo for an extended period. The fellowship required the winners not to undertake in any school-related projects during the travel.

(2) Self-funded solo travelers who traveled alone for personal reasons.

For the fellowship group, I was first introduced to a fellowship recipient through someone I met for the first time at a technical meet-up event. After contacting the winner, I conducted a pilot interview to learn more about the fellowship program and the winner's goals. This pilot interview helped clarify the aims and focus of my study such that I could modify them as needed before interviewing the primary participants (Weiss, 1995). As described in the Chapter 2, young Americans and students comprise the largest group of solo travelers in the U.S. Thus, recruiting from a pool of recent college graduates or current students provided the opportunity to include participants from this major group of solo travelers.

The next step was to contact the fellowship administration office describing my IRB-approved project. The administration staff sent an email to the recent fellowship winners via their mailing list to introduce my research and me. The initial introduction email resulted in multiple responses from the winners who expressed interest in participating in the study. I did not use a screening survey for this group because the fellowship program requirements matched my two initial recruiting criteria. In other words, all of the recent fellowship winners had gone to a solo trip for a minimum of three days or were planning to embark on such trip by July 2015.

Of the eight selected participants in the fellowship group, five were interviewed prior to their departure and again a few months after return. The other three had already returned from their solo trips at the time of their interviews.

The fellowship group was comprised of inexperienced travelers because the fellowship required that recipients have had no prior solo travel experience.

In addition, I recruited from the general public to meet my goal of interviewing a wide range of solo travelers. This criterion provided the opportunity to establish and study particular comparisons between the fellowship winners and the general public.

In the self-funded group, I initially looked for participants through a snowball sampling procedure. This procedure included talking to solo travelers at the airports, on the streets, contacting solo travel bloggers, and asking for referrals. I posted a screening questionnaire (See Appendix A) to multiple mailing lists, including travel forums and meet-ups. The mailing lists were not affiliated with any schools because my goal for this group was to recruit from the general public.

As I describe in detail below, I started the analysis of the interview data as soon as data was collected. Early data analysis of the themes and patterns that emerged led to changes in recruiting participants who could provide additional insights on particular themes. For example, I originally did not consider recruiting solo travelers who engaged in work-related activities during their trip. However, as I heard in the interviews and read solo travelers blogs, I learned that several solo travelers work while traveling. So I opened up the study to include solo travelers who spent part of their time working as they traveled. For more details, read the data analysis section in this chapter.

In the self-funded group, I interviewed 13 solo travelers ranging from inexperienced, first-time travelers to very experienced solo travelers. I eliminated two of the interviews because one of them was not solo at the destination but rather was meeting her family, and the other person's most recent solo travel was prior to 2009, even though he had traveled with companions many times after 2009.

The average length of travel for the fellowship group was about nine months; for self-funded group the average was three months. These averages do not include individuals who were traveling at the time of the interview with no definite plan to return.

While solo travelers are certainly not a homogenous group, and my sample may be small, it is representative of traveler demographics noted in other studies, such as backpacker demographics in Sørensen's (2003) and O'Reilly's (2006) research, and flashpacker demographics (Molz & Paris, 2015; White & White, 2007). These participant samples are comparable in features such as participants' geographic location, age range, education level, and gender ratio (equal number of female and male).

The solo travel sample included 11 women and 10 men, who ranged in age from 23 to late 60s, with an average age of 39. I did not screen solo travelers for using technology and kept the study

open to solo travelers who chose not to use technology. However, all participants were active on social media sites, weblog platforms, or photography websites.

The resulting sample captured a multifaceted spectrum of travelers, with a wide range of ages and backgrounds, such as academics, students, engineers, self-employed, and retired. All participants had traveled solo within the past two years to different destinations, both within the U.S and abroad. Participants were volunteers and did not receive incentives for participation.

<b>Participant</b>	<b>Gender</b>	<b>Age</b>	<b>Marital Status</b>	<b>Education</b>	<b>Most recent solo trip duration</b>
P1	F	23	Single	College student	7+ weeks
P2	F	38	Single	BS Degree	2 yrs - No definite plan to return. Interviewed during trip.
P3	F	33	Married	BA Degree	2+ months
P4	F	47	Divorced	BS Degree	3+ weeks
P5	F	30	Single	BS Degree	5+ years
P6	F	38	Married	BS Degree	4 weeks
P7	F	20's	Single	BS Degree	4+ years
P8	M	50s	Divorced	BS Degree	3+ weeks
P9	M	40s	Single	PhD	3 weeks
P10	M	40s	Married	PhD dropout	10 weeks
P11	M	64	Divorced	BS Degree	4 weeks - Interviewed during trip
P12	F	26	Single	MS Degree	8+ months
P13	M	38	Single	MS Degree	9 months
P14	M	27	Single	PhD student	8 months
P15	M	30	Single	MS Degree	8 months
P16	M	20s	In relationship	MS Degree	9 months
P17	M	20s	In relationship	BA Degree	9 months

P18	F	20s	In relationship	BS Degree	8+ months
P19	F	20s	Single	BS Degree	8+ months
P20	M	50s	Married	BS degree	14 weeks
P21	F	40s	Married	BS Degree	4 weeks

**Table 1.** The demographics of solo travelers participated in the study

### Interviews

As previously described, my goals for recruiting solo travelers were (a) to understand solo travel experience as perceived by the individual travelers who have gone on a long-term travel, (b) examine their motivations for traveling solo, (c) investigate solo travelers’ use of technology, and (d) study the role of digital tools in their travel.

To achieve these goals, I conducted qualitative in-depth and semi-structured interviews, which comprise the basis of this analysis. In-depth qualitative interviews provide a fuller understanding of the lived experiences of participants, and are better suited for my study than other methods, such as surveys (Weiss, 1995). Ethnographic techniques, such as field studies and ongoing participation, are also appropriate for understanding lived practice as it occurs (Molz, 2012). But observation is mainly useful for describing behavior and events and making inferences (Maxwell, 2012), which is not the purpose of this study. A combination of interview and observation could provide “a more complete and accurate account” (p. 94). However, shadowing or observing solo travelers throughout their long-haul trip was not a suitable for this study. I instead chose a non-structured interview method to allow participants freedom in telling their travel stories.

I developed two interview protocols to guide the interview sessions (See Appendix B). The first set of questions were for individuals who were planning to go on a solo trip, and the second protocol was for individuals who had returned from their trips or were traveling at the time of the interview. I designed the interview protocol to allow topical trajectories in the conversation that may stray from the protocol when it seemed appropriate. This flexibility allowed both me and the participants to go into detail, when needed. Both sets of questions were revisited and modified over the course of 15 months as new themes emerged or if specific questions needed greater clarification. Revisiting and modifying interview protocol is important in qualitative analysis and as Guest and Namey (2012) note, “It is easy to gain momentum on a track of

inquiry, only to find out near the end of the line that the track is destined for, or has already ended at, a dead end” (p. 28).

The total number of interviews, including pre- and post-travel interviews, was 26. Four participants were interviewed over Skype; two were traveling overseas, one participant lived in a central state, and another participant was in Canada visiting family. The rest of the interviews, 18 in total, were conducted in person in the states of Washington, Oregon, and California.

Participants were recruited over the course of about 15 months between the summer of 2014 and the fall of 2015. This window of time allowed me to modify my interview protocol and the frame of my research as I learned more about the topic.

Each interview took between 120-180 minutes (See Table 2). In order to provide a quiet and convenient place for the participants during such long interviews, I conducted the interviews in offices or conference rooms at public libraries. I would also ask the participants if they wanted to take a break during the interview.

Number of participants	Number of Interviews	Female/Male	Average age	Avg. interview length
21	26	11/10	39	2h 35min

**Table 2.** Summary of interviews

Participants were asked to think about their most recent solo travel and to mention its date, locations, and length. I also asked them about their motivations for traveling solo and the main advantages and disadvantages of traveling alone from their perspective.

In post-travel interviews, I employed the Critical Incident Technique (CIT) (Edvardsson & Roos, 2001) as an analytical method to elicit detailed information using narratives and self-reported stories, when appropriate. CIT provides a way to classify specific events, phenomena or occurrences, referred to as “incidents.” In CIT, participants are asked to tell a story about their experiences, allowing them to determine the most relevant incidents, providing a rich source of data of human behavior (Flanagan, 1954). For pre-travel interviews, I employed a semi-structured interview method and asked open-ended questions. (See Appendix B)

Participants were asked a range of questions including (a) technologies and information sources they used before, during, and after travel, (b) methods of communicating with others, including friends and family back home during travel, (c) whether they traveled to places without internet

coverage and if that impacted their travel experience, and (d) the activities they've participated in (e.g., hiking, sightseeing) at various destinations.

I asked for details about the digital tools they carried, their reasons for taking those tools, and examples of using those tools. I also asked each participant to think about a time that they did not have access to the internet or if their technology broke, for example running out of battery or memory full, and describe the incident and tell whether it impacted their trip. Participants described in detail the circumstances surrounding specific critical incidents, when these events took place. The final questions focused on whether they have any future plans to travel solo, and if so, would they do anything different in terms of planning, use of technology, or the places they would like to visit.

I ended the recruiting process when I reached conceptual saturation and was not getting new information from the participants. All interviews were tape-recorded with participants' consent and then transcribed. Participants were asked to leave an email address when signing the consent form in case a follow-up was needed. No compensations were offered for participation in this study.

### **Travel meet-ups and events**

While the empirical research findings described in design project 1 are primarily based on the interview data, in order to assure the rigor and validity of the data collection, I used two other sources of data: (1) participation in travel meet-ups and travel events, and (2) reading and following 40 solo travel blogs. Collecting data from various sources is called triangulation (Fielding & Fielding, 1986) and is used to reduce “the risk that your conclusions will reflect only the systematic biases or limitations of a specific source or method, and allows you to gain a broader and more secure understanding of the issues you are investigating” (Maxwell, 2012, p. 93). These two sources of data provided corroborating evidence.

### **Travel blogs**

I followed 40 travel blogs written by solo travelers. Eighteen of those blogs were owned by the solo traveler I interviewed, which were shared with me during interviews. However, not all of those solo travelers were actively posting and updating their blogs. They were most active during travel and immediately after return, although some of them had decided to create their blogs before they left. Other blogs were found by searching online using keywords such as “solo travel

blog” or more generally, “travel blogs. Most solo travelers had a list of other solo travelers in their blogs that I used to find more blog posts. To protect the privacy of study participants, I do not share their weblogs in this dissertation. However, I have listed the 22 other solo travel blogs in the Appendix C.

### **Data Analysis process**

After data was collected, I conducted a multidisciplinary exploration of the data through different theoretical and design perspectives with the goal of connecting scholarly research to design of interactive technology.

As previously described, I took a qualitative methodological approach to examining and interpreting data in order to elicit meaning, gain understanding, and develop empirical knowledge (Strauss & Corbin, 1990). According to Maxwell (2012), data analysis in qualitative research must be designed and decisions about how the analysis will be done in relation to the other parts of the study should be articulated. I draw on Maxwell’s methods for qualitative analysis to organize this section as follows.

*Reading, thinking, and observing:* The qualitative data analysis in this phase started with listening to and transcribing the interview data. This allowed me to revisit the questions and think about participants’ answers, such that I could reframe the study design or the interview protocol and questions if necessary. I also read the rough notes taken during or immediately after each interview. The purposeful, long gaps between interviews provided time to analyze data before conducting the next interview.

*Memoing:* The process of listening to the interviews was combined with reading the rough interview notes and writing new memos for future uses. Maxwell (2012) recommends this strategy for developing “tentative ideas about categories and relationships” (p. 96).

Memos, or analytic memos, are a versatile tool that refers to “any writing that a researcher does in relationship to the research other than actual field notes.” (Maxwell, p. 19) My memos mostly included notes of regularities and patterns observed in the interview data. Memos are versatile tools that can be used for different purposes such as capturing the analytic thinking about data, facilitating reflection on data, and stimulating analytic insights. In this study, I used my memos as a means to reflect on research methods, brainstorm possible theories to use, and develop coding strategies. In particular, the memos played an important role in selecting the theories that I used

for analyzing the data as described in design project 1. A sample of my memos is included in Appendix D.

*Conceptualizing the data through open coding.* Guest, Namey, and Mitchell (2012) and Shenton (2004) suggest that good qualitative research starts by developing an early familiarity with the topic of investigation. I employed an open coding approach to develop an intimate familiarity with the data while generating as many codes as possible. According to Strauss and Corbin (1990b, p. 61), open coding is the “process of breaking down, examining, comparing, conceptualizing, and categorizing data.” In open coding, conceptualized labels are ascribed to discrete events and instances of a phenomenon.

The code development process was concurrent with data transcription. In other words, I was making data and handling them iteratively. The interplay between making data and handling data was helpful in shaping the design of my research and revising my research questions (Guest, Namey & Mitchell, 2012; Walther et al., 2013). I read and analyzed the data line by line, and codes were refined through discussions with my advisor and committee members. This approach ensured high-quality data collection and analysis methods.

The iterative process of analyzing data led to modifications of my interview protocol at the early stages of conducting interviews. One such modification was the use of the word “reflection” in the protocol. Some participants were not comfortable explicitly using the word reflection, which resulted in using alternatives, usually borrowed from the participants’ own words. Another modification of the interview protocol was that some solo travelers did not identify themselves as “solo travelers” because they associate the word “solo” with loneliness and isolation. In their solo travel experiences, they would meet people and were not isolated. In my further communications, I considered using alternative terms, such as “independent traveler,” or limit use of the word solo except when it was absolutely necessary.

*Categorizing.* After conceptualizing the data and identifying particular phenomena, I compared them against one another in order to group them into categories. These categories were provisional and shifted as I coded more data, read the literature, and learned more about the topic. The categories were also discussed with and adjudicated through meetings with my advisor and committee members. Categories created at this step were descriptive or substantive categories. See Appendix E for the categories generated in this step.

*Understanding the data.* To identify the relationship among the different elements of the text (Maxwell, 2012), I used thematic analysis (Boyatzis, 1998). When employing this method, each theme “captures something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set” (Braun & Clark, 2006, p. 224). Thematic analysis provided the flexibility to analyze the data to gain “a rich and detailed, yet complex account of data.”

As discussed in Chapter 2, some researchers point out the importance of using theory and research in informing design practice, but they argue that most of the attempts to do so have not been successful. Rogers calls for case studies to help designers see how theoretical approaches apply to the *process* of interaction design, and my dissertation is a response to this call.

## **Section B - Data analysis rigor**

In this section, I describe the steps I took to ensure this research was conducted rigorously and systematically.

To ensure my research procedures were methodologically sound, I combined Shenton’s (2004) framework with Walther et al.’s (2013) quality strategies model. Shenton’s indicators of high research quality are Credibility, Transferability, Dependability, and Confirmability. Walther et al, built on the engineering metaphor of quality management to develop a systematic, process-oriented model that consists of two dimensions: making the data and handling the data. (See Appendix F for Shenton’s (2004) strategy and Walther et al.’s (2013) typology of quality strategies.)

Integrating these two approaches allows for more precise assessments about the quality of one’s research. For example, when discussing a research procedure’s credibility, we can evaluate credibility in terms of making the data as well as handling the data. Thus, if data collection is rigorous, but data analysis is not, efforts can be made to improve that stage without critiquing the entire research.

Walther et al. (2013) argue that quality is a hard-to-define variable, yet researchers should continuously strive to enhance their research at each step in the process. The authors suggest that quality should be monitored and controlled over time. The Walther et al model guided this research by encouraging me to confront important questions, like: does the method I am taking *make* the kind of data needed for my study? Is my *data handling* method credible? This process

was particularly important in my research because, like in most qualitative research, I did not make all the data first and then handle them second; there was an interplay between the making and the handling of data.

In addition, Walther et al.'s (2013) method offers quality control validation at five stages of the research process: theoretical, procedural, communicative, pragmatic, process validation. This allows for more precise discussions of quality at each of these stages. This differentiation is not easily discerned from Shenton's (2004) framework, but Shenton's criteria provide a checklist that helps the discussions around the *overall* credibility, transferability, dependability, and confirmability of the research.

I use Shenton's quality criteria as a framework to discuss the rigor of data analysis in this dissertation while integrating Walther's steps along the way.

**Credibility:** deals with the question of "how congruent are the findings with reality?" I took the following steps to ensure the credibility of the analysis:

1. I employed well-established research methods (as described in this chapter), which Walther refers to as procedural validation in the data making process.
2. I developed an early familiarity with the culture of participants before I started recruiting and collecting data. This was done through reading the literature, visiting various travel blogs, meeting with the fellowship administrators, conversing with a solo traveler prior to developing my interview protocol, and reflecting on my own personal solo travel experiences. This meets communicative validation at the "Handling the data" level in Walther's strategy.
3. Sampling of participants: I employed different sampling methods as described above. This method introduced some randomness to my dataset, which helped ensure that possible unknown influences are distributed evenly within the sample. This maps to Walter's theoretical validation for making the data.
4. I used techniques to ensure participants communicated their ideas honestly. For example, participants in my study were not incentivized. This ensured that data collection involved only those who were genuinely willing to take part and prepared to share their stories without expectations. They had the option to refuse to answer any questions or withdraw from the study if they liked. I attempted to establish a rapport with the participants and be a

good listener. Keeping their information confidential was another way to encourage open and honest responses. These tactics augment procedural validity in making the data in Walther's model.

5. I asked iterative questions through probing to elicit detailed data and took thorough notes so I could return to those issues further in the interview process. This is also procedural validation for making the data.
6. I had frequent debriefing sessions with my advisor and committee members. These meetings were very helpful in guiding the research direction, learning about new literature, and eliminating potential biases. Additionally, I discussed my research with scholars and other individuals inside and outside the University of Washington. Talking to people helped me gain fresh perspectives and, at times, challenged my assumptions. In addition, I talked to professors outside my committee and those who are experienced but not too close to my project, so they it could be assessed with detachment. This also improves communicative validity for handling the data in Walther's model.
7. I used reflective commentary to evaluate my progress and kept an analytical memo (see Appendix D for an example). This helped monitoring the research direction, which maps onto procedural validation in handling the data in Walther's model.
8. I also shared the interview transcript with participants who were willing to read it and asked them to let me know if that was an accurate representation of the interview. This was particularly helpful for one of the participants who backtracked frequently as he talked. This ensures communicative validation for making the data in Walther's model.

**Transferability:** According to Shenton, the procedure for documenting data and establishing a study context helps assess its transferability. Walther et al. also talks about the need to collect and record data in a dependable way at the process reliability step. As can be seen in this dissertation, I have documented the steps and provided supplemental documents, when necessary.

**Dependability:** In this dissertation, I described the research design and its implementation, the operational detail of data gathering, and reflected on each design project to evaluate the effectiveness of the process. In Walther's model, this maps to the process of reliability in

handling the data. This included procedures for generating and representing knowledge were established and documented.

**Confirmability:** This criterion discusses the need to provide an in-depth methodological description so the research can be replicable. It also requires the researcher to discuss her assumptions and biases, and to recognize the study's shortcomings. I've discussed my assumptions and biases in Chapter 7. This would also map closely to Walther et al.'s (2013) process reliability in handling the data.

## Section C - Design Projects

Data analysis proceeded in three phases, or design projects. Building on Zimmerman, Evenson, and Forlizzi's (2005) work, I call each phase a design project. The authors note, "[a]lmost all design work conducted today resides within a project; therefore, we feel the best opportunity for increasing the output and significance of design research comes from identifying area[s] in a project where knowledge can be extracted and documented for a larger audience."

All design projects analyzed interview data and synthesized with other sources (solo travel blogs, meet-ups, and events) through different approaches with the goal of systematically connecting research to interaction design in order to develop technology that fits the needs of solo travelers.

Design project 1, presented in Chapter 4, is a design exploration through qualitative analysis of 26 semi-structured, in-depth interviews with solo travelers. I describe the thematic analysis of the interview data through two research perspectives: (a) what are the sociotechnical practices of solo travelers, and (b) what types of activities solo travelers engage in. The findings of design project 1 are twofold; (a) I discuss the sociotechnical practices of solo travelers through four emerged themes, and (b) I develop an activity-based framework that represents the types of activities solo travelers engage in.

Design project 2, presented in Chapter 5, is a design exploration through *theoretical approach*. I discuss the connections between solo travel and the issues of self and identity through three identity theories; (1) the protean self, (2) the saturated self, (3) the presentation of self. I describe the analysis of the interview data through these three theories and structure the findings around the activity framework developed in design project 1. I also introduce a 2-dimensional analytical design process inspired and developed through the act of combining the theoretical data analysis with the activity framework.

Design project 3, presented in Chapter 6, is a Research through Design (RtD) exploration where I work with 16 designers to create 5 interactive tools for solo travelers using the 2-dimensional analytical design process developed in design project 2.

### **Human-Centered Design (HCD)**

In each of the design projects, I take a HCD approach to use and synthesize the findings with the goal of designing interactive technology for solo travelers. Human-centered Design is a widely used design approach in HCI that Norman and Draper introduced in 1986. The International Standard Organization (ISO) defines Human-centered design as,

“a creative approach to interactive systems development that aims to make systems usable and useful by focusing on the users, designing around their needs and requirements at all stages, and by applying human factors/ergonomics, usability knowledge, and techniques. This approach enhances effectiveness and efficiency, improves human well-being, user satisfaction, accessibility and sustainability; and counteracts possible adverse effects of use on human health, safety and performance.”<sup>7</sup>

The focus of HCD is to understand and explore the needs and desires of users and their intended uses of the product. HCD was initially termed User-Centered Design or UCD, but Norman later switched from “user” to “human” because he thought the former was a “bit degrading” (Norman, 2016). User-centered design and its abbreviation, UCD, are still widely used, but it is synonymous with HCD (Earthy, Jones, & Bevan, 2001).

A traditional HCD approach involves six steps: (1) Define the project, form the team, and develop a hypothesis, (2) Discover users’ needs and the context, (3) Synthesize findings from the discovery step, create personas and scenarios if needed, (4) Construct features and functions, a design language, interactions and flows, (5) Refine and evaluate iteratively evaluate to improve the design and finalize the specifications, and finally (6) Reflect on the process and assess gaps and opportunities for future designs (Zimmerman, Evenson, & Forlizzi, 2005).

There are several methods that follow HCD principles; some consult users about their needs at specific times during the design process—typically during requirements gathering and usability testing— while others partner with users and involve them throughout the design process

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<sup>7</sup> Accessed via <https://www.iso.org/obp/ui/#iso:std:iso:9241:-210:ed-1:v1:en>, Feb 20, 2017

(Abrás, Maloney-Krichmar, & Preece, 2004). While these steps may manifest differently across projects, they all operate using the same iterative model that prioritizes the needs of the user.

In the three design projects outlined in subsequent chapters, I comprehensively discuss how each approach contributes to design interactive technology for solo travelers along with the limitations of each approach.

## Chapter 4. Design Project 1: Research-driven design

Design project 1 seeks to answer the first research question, *What role can research data on phenomenological experience play in guiding interaction design in the domain of solo travel?* To address this question, I conduct a thematic analysis to analyze 26 semi-structured, in-depth interviews with solo travelers. I discuss the findings of the this thematic analysis using:

- (a) A description of sociotechnical practices of solo travelers and their relationship to technology through four inductively generated themes.
- (b) An activity-based framework that represents the types of activities solo travelers engage in.

I approach the analysis using a Human-Centered Design (HCD) perspective, where I connect these initial findings to design interactive technology for solo travelers. I describe the design ideas and close this chapter by discussing this approach and its limitations.

### Section A - Solo Travel through sociotechnical perspective

As described in Chapter 2, solo travelers rely heavily on various technologies throughout travel, but there is limited research on their use of technology, especially in the design-oriented communities. Little is known about the sociotechnical practices of solo travel and possible influences of these practices on the increase in solo travel and the affordances of technologies that support solo travel experiences. Solo travel is embedded in a complex context that involves various technologically mediated interactions, yet these interactive practices are under-studied.

Understanding how travelers adapt to technological changes is essential because technological development is driven by travelers' needs and wants. As Xiang et al. (2015) argue, there is a dialectic relationship within and between the sociotechnical systems, wherein actors in these systems influence each other, which ultimately lead to changes in the structure of the system itself.

After initial open coding of the interview data, it became clear that sociotechnical practices was a broad lens, and there were various factors related to solo travelers' use of technology (e.g., social

factors, technical factors). Using a broad lens like sociotechnical practices made it difficult to group and generalize the findings in a meaningful way.

To address the broadness and complexity of solo travelers sociotechnical needs, I coded the interview data using two perspectives:

- (a) I narrowed my focus and coded the data based on the relationship between solo travelers and the technology they carried and used while traveling. This decision was influenced by the patterns I saw in the data on how solo travelers viewed and talked about technology.
- (b) Since travel is an activity, and technology is used differently based on the activity the solo travelers engage in, I coded the data through an activity lens and developed an activity framework that helped organize and guide the design exploration.

I inductively generated four themes from the interview data with respect to solo travelers' sociotechnical practices. These themes were selected with the specific intention to help inform design, rather than generating exhaustive list of the themes. I begin my analysis by first describing the solo travelers views and desires regardless of the role of technology. Next, I illustrate in what ways technology supports solo travelers' desires by focusing on the sociotechnical practices. Framing my analysis this way helped highlighting the needs of solo travelers that are not currently supported or satisfied by technology, which was important in applying these finding to the designs.

**Theme 1- Solo travelers see technology as an undemanding, unintrusive, proxy travel companion.**

Participants often viewed technology as the best of both worlds. They could travel solo but rely on technology to alleviate many hassles without needing to engage in human "messiness." In general, freedom was the most important feature of traveling solo regardless of using technology. For example, P17, a young male in his mid 20's from the fellowship group who had traveled over 8 months, said,

"I mean just the freedom to do whatever you want. [...] Sometimes I may be in a big city, with many interesting things, but sometimes I just want to sit in a park for an hour. Most people I travel with do not want to do that (mimics). "We have to go here, and we have to go here, and we have to see this". Sometimes I

just want to sit in a park and people watch, do something that is not touristy, and people are not always down with that. The biggest thing I like about it is complete and total freedom and do whatever I want without having to coordinate with anyone. If you want to actually meet up with someone, usually you can find someone to chat with, or go somewhere with, and then they go on their way and you go on your way. I don't see any disadvantage to traveling alone. You do get lonely, but it is not hard to find some other traveler to hang out with for a bit.”

P7 explained that when he gets lonely, he knows that he can use technology, and more specifically social media, to connect to friends and family. He also talked about the various times he called his family over VoIP (Voice over IP) services. It was through these online interactions with his parents that he was able to get their buy-in to let him travel to South Pole. In addition, participants did not believe technology would diminish or hamper travel flexibility. They mentioned the undemanding nature of technology, noting that as long as they kept devices charged and don't break them, technology is there for them. Technology allows solo travelers to have all of the benefits of traveling solo, while also having many of the advantages of traveling with a companion. For many participants, solo became their preferred traveling method, while for others, it was their first time journeying alone. Participants discussed the advantages and disadvantages of traveling solo, and below I synthesized their sentiments with similar conversations on solo travel blogs.

Participant statements about the advantages of solo traveling:

- Sense of freedom
- Limitless possibilities
- Not having to please someone else
- Higher chances of making new friends
- Have complete control over my itinerary
- Higher chances of having spontaneous interactions with locals and strangers
- Easier exploration as companies with separate travel interests can make traveling together difficult
- Not being distracted by a companion helps immersing myself fully while being more cognizant of my surroundings
- Easier to get outside of my comfort zone /testing my mettle – a motivator for many solo travelers to travel solo.

Participants noted using different tools throughout their travel experiences when they felt lonely, distressed, happy, excited, or unsafe – times where a travel companion would be advantageous. Examples included: reading books on Kindle at bed time, listening to music in transit, taking photos while exploring, browsing photos, sharing moments via social media or VoIP tools, GPS tracking tools to let family know where they are. Technology can allow for greater flexibility and autonomy, but also provide human interaction and connectedness. Technology available on the road is a benevolent companion that brings peace of mind.

For P18, the ability to read books on her Kindle was very important, especially before bedtime and when she felt lonely. P18 is a young female solo traveler in her mid 20's from the fellowship group who had traveled for over 8 months. As she was traveling through different countries, her friends on social media would recommend relevant or interesting books or articles. One of her goals was to finish reading all those books by the end of her trip. She said,

“I had my Kindle, that was a- that was such a huge deal. It was fantastic to have the Kindle there. [...] I downloaded a lot of books and it was great. And now that I'm back home, I can- I like to fall asleep with it. But I don't really like using it here. It kind of robs me of this tactile sensation I didn't realized I liked to the degree that I did. But it was fantastic to have the Kindle there. [...] I feel real well-rounded now. And also like, I knew that I wouldn't have read those books in the United States; <laughs> I wouldn't have got that bored.”

Similarly, P19, a young female in her 20's from the fellowship group, enjoyed listening to the songs recommended by her friends in her downtime as a nice way for escaping from noise and falling asleep.

“I brought an old iPod with me on my trip, too. [...] So I would listen to music, even while I was sleeping; it drowned out the sounds of other people. I think that's all I used in my, like, downtime.”

Participants also discussed advantages of traveling with a companion. These included:

- Safer and less stressful
- Taking photos of myself
- Convenient because help carrying the gear
- Lower chance of feeling lonely and homesick
- Less expensive trip if the companion can pay his/her share
- Look after things when needed like when using the restrooms, etc.

Participants said the advantages of traveling solo outweigh the benefits of traveling with a companion and described various scenarios where technology replaces the need for having a companion. One example was using selfie sticks to take photos.

Despite the advantages of having a human travel companion, P11 said,

“Even if I am with a travel companion, I still sometimes just want to go somewhere or do something by myself.”

P11 is a 64-year-old divorced male solo traveler from the self-funded group. He said the same things about traveling with others, she said,

“My travel buddy should be somewhat independent and happy to go off by themselves for awhile, so we can have alone time.”

Digital devices often became the extended part of these solo travelers “selves” (Belk, 2013). They helped solo travelers get cope with fears and insecurities, helped actualize their fantasies (as Mazlish (1995) notes, fantasy is part of human reality), actualize daydreams (e.g., wishing to be somewhere else, having wealth, status), and facilitate experimentation (through reading other people’s stories, watching videos, etc.).

With all the technology travelers carry with them and their connections to family and others, it might be safe to say that these travelers were not really solo. As they seek balance between novelty and stability (Iso-Ahola, 1983), these personal digital devices might make the best travel companion because they can provide stability while travel itself offers the novelty they are after.

Smartphones, in particular, have become an essential travel companion. Mazlish (1995) discusses the relationship between technology and humans in Western societies and notes, “humans are not as privileged in regard to machines as has been unthinkingly assumed.” To Mazlish (1995, p. 4), “the same conceptual schemes that help explain the working of the brain also explain the working of a thinking machine.” Humans’ refusal to acknowledge this continuity is the reason people distrust technology and do not accept it as an extension of themselves. In light of this information, perceiving a smartphone, as a real travel companion is not as strange as one might think.

Considering that many travelers to go solo because they want to be free of the social obligations of travel companions, these personal technologies make a perfect travel companion without introducing any social obligations or other constraints.

## **Theme 2– Solo travelers actively sought a balance between staying connected and disconnecting**

Participants talked extensively about minimizing the use of internet or unplugging all together in favor of being in the moment and enjoying their trip. They wanted to soak in the full experience of traveling and connect and engage while traveling, not just be tethered to their device. They actively sought to achieve a balance with the utility of the device versus feeling hamstrung by it. Participants had varying, and sometimes conflicting, needs when it came to deciding between being connected to the internet or disconnecting. For example,

- Need to be left alone
- Need to limit access to new people
- At the same time, there is a need to connect and keep in touch with family and friends back home. Balancing their current connections while seeking new ones
- Need to meet many new people to find the ones that will be lifetime friends or travel companions for part of their travel.
- Need to be part of a social support system of like-minded travelers Need to try new activities to find the ones that will make them happy
- Need to focus on a single activity in order to be more focused, connect with their souls, and for personal growth.
- Need to be disconnected from others, including family and friends to immerse themselves in their travel experience. It was nice to check in, but they also needed to disengage from home to truly be a traveler

Participants talked about the challenge of how much time they'd like to spend online. Participants said that they felt spending time online would take away from the experience of travel. Some decided to stop blogging because they wanted to spend more time outside exploring. A few decided to completely disconnect from social media in order to immerse themselves in travel, but later came back to using social media in a more balanced way. In other words, they first found social media and connectednesses disrupt their travel flow and experience, so they decided to unplug completely to address the problem. P14, a 27-year-old male PhD student from the fellowship group, said,

“[using technology] is like an escape, it is a thing you go to a lot of times when you need to distract yourself from something else. And for me that's what it would be, when I would have these adventures in day time, and they would be fantastic, and then I would come home and would feel a lack of, or a sense of

not being fulfilled even though I had an amazing day um and I can look objectively and say this is fantastic but something would kind of be there, and since I'm not moving anymore or doing an activity, I'm like what can I do, what can I do to take my mind off that insecurity. I would go to my technology and send an email. Or I would surf the web or find someone to distract myself with. [...] I am definitely trying to get over it. Um, it's definitely something I paid attention to, and I definitely tried to get over. Um, I did not want to use my stuff as much as I did. There were times that I became better about purposely setting aside and going out, walking around the city, or exploring or something.”

For him (P14) using social media and email was a way of connecting to his old life, which was desired to him at certain points during his travels, mainly as he was trying to get over his insecurities. The period of disconnectedness provided a great opportunity for solo travelers to reflect on their travel, on themselves, their past, and also thinking about their futures and what they wanted to do when they returned. A desire to disconnect was, at times, triggered by passing through areas that did not have internet access or areas where it was not easily available. For example, if travelers needed to get certain types of SIM cards or mobile services, they expressed more desire to disconnect. During these times, some solo travelers started to see the benefits of unplugging and connecting to the immediate environments instead of far reaching places, like their homes.

After a period of abstaining, participants expressed their appreciation for connectedness in a different way and decided to use the internet in a more balanced and responsible manner. But obtaining balance was different for each participant. For example, one participant decided that she did not want to hear anything about sports anymore, while others decided that it was time to disconnect from certain friends or coworkers. This was also the time that travelers started to reflect on and evaluate their relationships.

P18, a young female in her mid 20's from the fellowship group who had travelled for about 8 months, said she initially wanted to disconnect completely from home and not hear about the events happening there. She said,

“I feel like that's the purpose of leaving your country, is to- is to not be as connected to everything going on there, and to just see stuff through the eyes of someone not from your country.”

However, when she got close to returning home, she started to realize and appreciate how technology facilitates connecting to family and friends, and said:

“I felt kind of shitty; I was like, <sighs> I haven’t been the greatest to my parents, but like ... in the past [people] had to tell the phone company that [they were] going to be placing the international phone call to the United States several days in advance, and that it was going- how much money it was going to cost and all this. [...] everything had to be planned so innately in advance. And ah, to me, I knew [calling my parents over wifi for free] was an option, and I just decided to be obstinate, and pretend like it wasn’t, because I didn’t want to be contacted, I didn’t want to hear about what was happening [back home].”

Some participants seemed to obsess over their devices and began to look forward to spending more time with technology at the end of the day, rather than engaging more with others. When there was no technology, they reported feeling a void. This actually increased their isolation and turned them into a solo observer instead of a solo traveler, dampening whatever immersive experience they hoped to have. P14, a 27-year-old male PhD student from the fellowship group, shared his experience of complete abstinence during his time at a monastery as below,

“When you enter the monastery, you give them all of your stuff. So you are there for ten days. But yeah, I think during that period you are meditating 12 hours a day, and you sleep, and you have your meals, but you have 2 hours, 2.5 hours of free time, which ends up being nap time or just kind of walk around the area and I think those were the times when I was becoming anxious. it was like, the downtime, when I'm not doing something was when I was thinking more about technology, when I'd start going towards technology as an escape.”

This participant found the rules in the monastery so restrictive that not having access to technology, especially to connect to friends and family, made him anxious mainly during his downtime when he was not occupied by the monastery activities.

### **Theme 3- Solo travelers used technology as a pretense to break social ties and social norms**

Participants talked about solo travel as a way of reflecting on their relationships with friends, family members, colleagues, and others. While the act of traveling solo provided these participants with the space they needed from the social ties they did not like, they used technology to establish a break from those individuals. Participants felt that it was at odds with social norms to break social ties, especially family members in real life, yet they found that

unfriending, unfollowing, and removing those individuals from their Facebook, Twitter, Instagram, and other social media accounts was not as challenging.

Participants perceived the act of unfriending people through social media as a gentle way of saying “we are no longer related,” or as P4 said, no longer “buddy-buddy.” Participants thought solo travel makes cutting off the relationships socially and culturally acceptable as they depart from home and were no longer obligated to remain in touch with social ties. However, it was the technology that not only facilitated the break with social ties but also subtly made it known in a way that doesn’t violate social norms. Thus, travel supported by technology enabled solo travelers to manage their relationship challenges from home.

For participants who expressed a desire to cut ties, doing it via technology avoided social fallout and the need to deal with another person's emotions. Here is how technology helped P18, a young female solo traveler in her mid 20’s from the fellowship group, to resolve an issue with a relative,

“my [family member’s] mother is just unbelievably irritating on Facebook. And I never had deleted anybody for any reason before. <laughs> [...] So first, I was just making different lists, and be like- and there was one that’s called everybody *but...* and so I could upload everything to that, and then she wouldn’t see it. And then, like after *other* people have gone through, and liked, and left *regular* comments, then I can change the setting. And then um... and then it got to be too irritating. [...] And I was like, I don’t want to be... I just deleted her. I couldn’t deal with it any longer.”

And P14, a 27-year-old male PhD student from the fellowship group, used limited internet access as an excuse to break up with his girlfriend,

“For me I was at a transition point in my life, I felt like I was coming from a [...] program, from a particular part of my life, dating this girl, I was kind of like moving into something different. I wasn't sure quite what I wanted that to look like. [...] So I saw this [solo travel] as the perfect break to go abroad and explore different aspects of myself as well as reflect on my relationship with my girlfriend. [...] I was kind of insecure inside, I was going back to like emails and Skype a lot, every day, a few hours a day sit in my hostel a lot of time on the internet talking to her. [...] then I started like uh, you know filtering it off, using internet less, and doing more day adventures. Be gone the whole day. Um, you know I would come home to hostel and use internet for 30-60 minutes [...]. Then, in [country’s name], when I first got there, there was no internet, there was

no power and you would go back n forth with power, no Wifi so I kinda used that to, you know, cut my relationship. [...] she was more of the mind that we should break up that way you can have your travel experience. And I was like "No!" "No!" I want to keep this going. [...] She was probably happier when I was not contacting her actually.”

This participant used intermittent access to the internet during travel as an acceptable excuse to slowly end his relationship with his girlfriend back home.

#### **Theme 4 - Solo travelers found that technology helped them have more spontaneous experiences.**

Spontaneity and serendipity are important to solo travelers. Participants reported connecting with like-minded travelers, including foodies, hikers, luxury travelers, hostel residents, and individuals who identify as gay. For example, P13, a 38-year-old single male from the fellowship group, described his joy and desire in meeting new people quickly and easily as one of the main features of travelling solo:

“I got on a tram and met this guy. I said, "Hey, I'm new. I've never been anywhere before. Can you help me with my map and find my hostel?" And he looks at me and says: "Yeah, that's a couple blocks down from my flat." So he walks me to my hostel and I'm standing outside the hostel trying to figure out how to get inside. [...] I was like I want to get a drink! So, I ended up going to a gay bar that turned out to be right around from my hostel and met some guy and ended up spending the whole weekend with him. And left [the city] and then came back to visit him. Was friends for awhile but we have not talked in almost a year. We kind of parted ways abruptly. I found that I made friends very quickly.”

Participants noted how technology contributed to spontaneity and serendipity. Using technology, individuals can announce on social media platforms where they are traveling and instantly connect with other travelers or locals. Individuals can also announce in advance where one is traveling and make connections ahead of time, schedule “meet-ups,” find “local only” information and “know” an area, long before the traveler arrives in the area.

Many solo traveler Instagrammers update their profile anytime they change an area and/or update their information to share where they are going. They also cross promote with blogs, Facebook pages, and Tumblr and Twitter pages. They can connect with their followers and fan bases on multiple platforms and have native or traveler-vetted information anytime they need it.

In this fashion, technology accelerates solo travelers ability to have spontaneous experiences. The ability to find people “on demand” allows individuals to travel solo, but also travel socially, whether it is finding a roommate through AirBnB, meeting a local to go to a party, or finding social venues to have immediate companionship.

Technology’s ability to facilitate such unique and spontaneous moments is one reason why people travel solo; it gives the traveler some control over his or her own “serendipity.” With this information at their fingertips, travelers can choose which encounters to pursue and which to ignore. P19, a young female in her 20’s from the fellowship group, felt it was liberating to be able to change plans as many times as she liked throughout her travel. She was in touch with other solo travelers over social media during her travel and she would arrange to meet with them in certain places. However, as described earlier, solo travelers wanted to be free and be able to change plans as they wished. This means that occasionally, her friends (or herself) would cancel the plan because they had changed their minds and wanted to stay in that place longer or visit somewhere else. Technology and social media facilitated their desire to be spontaneous and change plans last minute. She (P19) said,

“It was spontaneous, I thought maybe I could fit in Madagascar. Because I had heard- I mean, I’ve always heard good things about Madagascar, and another fellow was going to go there. She was telling me about all this cool stuff she had planned, and I was like, “I want to go there,” then I decided, okay, I’m not going to go. It’s too expensive. But then we had this month, I had this whole month pretty much open up, and Botswana got canceled, it’s like, “Okay, I’m just going to go.” So I bought a flight, and went. And it wasn’t that- you know, if it also happened to not be that expensive at the time, so it was helpful. So that added Madagascar. And then Europe was just kind of an add-on, on the end of my trip, so that’s also added quite a few countries, yeah”

In quote after quote, participants revealed that solo travel might be more social than we are inclined to think, even compared to traveling with groups. A sentiment reflected in many interviews as well as solo travel blogs was that when one travels solo, she/he is perceived as more approachable, and people feel more comfortable starting conversations. These spontaneous conversations seem to happen less often when one travels with companions.

### **Discussion of findings: Solo travel through sociotechnical perspective**

Based on this inductive, qualitative investigation that explored solo travelers’ relationship with technology, solo travelers turn to their devices as a travel companion that (a) facilitates

autonomy, (b) supports one's desire for freedom, (c) enables breaking away from undesired social norms and social ties, and (d) allows for spontaneous connections with other travelers and locals.

Solo travelers welcomed technology in all aspects of their travel, including photography, meeting people, navigating, information seeking, entertainments, and planning, etc., Many said they are not sure if they would travel solo without their devices. Participants' main concern was keeping their technology charged and secure. But these minor challenges would not keep them from bringing technology on their trips; instead they reported taking precautionary steps, such as carrying extra batteries or using safety locks.

Technology seems to be indivisible to solo travel, a finding does not seem to be limited to young, affluent travelers as some other studies show (Molz & Paris, 2015; Cohen, 1973; Pierce & Gretzel, 2012; White & White, 2007) but rather my results show it is used widely by solo travelers of all ages.

As solo travelers became more attached to various technology, the question becomes whether they are really solo? Using technology to seek like-minded individuals and communities suggests that it might be hard, if not impossible, to travel completely alone. These individuals are very dependent not only on open infrastructures, such as parks and campsites to pitch their tents, but they are also dependent on technological infrastructure, such as internet and electricity. The popularity of solo travel seems to be augmented by the availability of necessary technical infrastructure is available. Solo travelers embark on their trips entirely dependent on such infrastructures.

As mentioned earlier, this chapter sought to understand solo travelers' sociotechnical practices. Even narrowing down the analysis scope to focus on the relationship between solo travelers and technology, the themes discussed here and this discussion merely scratches the surface. For example, I touched on the possible differences between affluent and budget travelers in terms of their technology use, but a more systematic analysis is required to really unravel how wealth and social status impact one's sociotechnical practices. I also mentioned briefly that solo travelers use precautions to keep their technology secure, a practice not seen as burdensome to these individuals. However, this topic also deserves further investigation to understand how keeping technology secure impacts their decisions on which technology to bring with them.

## **Section B - Solo travel through activity perspective**

As previously discussed, sociotechnical practices were a very broad lens to analyze the interview data. In the process of coding and synthesizing the study's findings, it became clear that solo travelers use of technology evolves from the time they start thinking about a trip until after they return. This made it difficult to identify generalities that would serve as a central focus for how travelers use technology, and further highlighted the complexity of individuals' sociotechnical needs.

These interviews also revealed that society and technology play different roles throughout the process. To help understand these differences, I initially divided individuals' travel experiences into three phases: pre-travel (planning), during travel, and post travel. My initial goal was to analyze each interview using these parameters, and this framework was generally helpful in classifying activities. But some stages of the travel process proved problematic. The framework implies sequence, and many travel activities do not necessarily occur sequentially. For instance, individuals who choose to travel indefinitely—aka nomads— may not “return” in the traditional sense after a trip. These travelers move from place to place, meaning they are always both pre-travel and post-travel. As such, they may perform practices pertaining to pre-travel phase for their upcoming trip while at the same time reflecting on their previous trips. For established nomads, pre-travel was a distant memory and was not regarded as a significant phase. For these nomads, the boundaries between these three phases are poorly defined.

Additionally, non-nomads and regular travelers spend more time in the pre- and post-phases of travel than the trip itself. Post-travel can be an especially long stage because individuals share many stories, photos, blog posts, and social media updates long after travel has ended. Therefore, the amount of time solo travelers spend in each state varies significantly, which can their perceptions of those activities.

At a more existential level, travelers who return home after a long trip may not find it to be the same place they left. As the denouement of Thomas Wolfe's book (2011, p731) poignantly argues:

“You can't go back home to your family, back home to your childhood [...], back home to the ivory tower, back home to places in the country, to the cottage in Bermuda, away from all the strife and conflict of the world, back home to the father you have

lost and have been looking for, back home to someone who can help you, save you, ease the burden for you, back home to the old forms and systems of things which once seemed everlasting but which are changing all the time—back home to the escapes of 'Time and Memory.'”

Furthermore, solo travelers engaged in different activities throughout these phases. For example, during the pre-travel phase, individuals are mainly information seekers looking for inspiration. During travel, the activities were more about tasks such as moving their body from one location to another, feeding and sheltering themselves, or interacting with locals. Once they arrived at a location, they explored the area in different ways.

Considering that travel is activity-based, I shifted my framework from one that was defined temporally (pre-during-post) to one that was defined by types of travel activity. These activities could be long-lived (like photography or engaging in social media) or transient (like purchasing a ticket), and in some cases would highlight their relationships with others. I coded the interviews based solo travelers' activities (e.g., photography, sightseeing, hiking, wandering around, lodging) and after a few rounds of coding and refining, I inductively generated four types of activities:

### **1- Preparation activities**

Preparing for travel is a form of detaching from an earlier fixed point in travel, in social structure, from a set of cultural conditions (a state), or all. Travelers start to develop a strong sense of anticipation when thinking about upcoming travel. They discuss travel with others in person or on social media, research the places they'd like to visit, assess the possibilities of traveling to those places, estimate the budget, generate a rough plan, as well as a contingency plan for emergency cases – like where to spend the night if a hotel is not available.

Solo travelers also start thinking about and researching technology that would best support their travel. For example, P18, a young female in her mid 20's from the fellowship group, said,

“I told my dad that- I was like, “Do you think I should get a GoPro, ‘cause I know that I’m gonna treat all my stuff like crap, and it’s gonna get beat up, and smashed, and might get water on it.” And he was like, “Let me research this for you, and I’ll get back to you.” And um- and then he just got me like, a Panasonic camera, that’s... kind of like the whole point of it, is to be like, waterproof, and smash proof, and drop-proof, and all this stuff. And it was perfect, because I don’t think- and I’m- I’m not a very good video editor and I think it would have

been a big waste for me to have a GoPro, 'cause I don't- I wouldn't have been able to work with a point-and-shoot very well, and I don't even really like videos. So it was just perfect.”

It was important for P18 to have a camera to share photos with her friends and family – as she had promised them to do so and that was the way her mom would know she was safe. P18 later said that she had taken thousands of photos during her extended travel and the extensive research she conducted in choosing a camera was well worth it. For P15, a 30 year-old, single male from the fellowship group, it was important to carry a device that would let him blog. He talked about the challenges of bringing a laptop with him and said,

“I am in the process of figuring out what am I going to bring as a computer or tablet, I am going to try to keep a blog throughout the trip, so I'd like to have something that is easy to type a blog post. But I also want to have something that if it's broken and stolen that it won't be a really expensive thing to replace. Like a cheap tablet or the Acer or small thing (Netbooks), something cheap that I can type on it and get on the internet. So I have not quite decided, but I am pretty close.”

This participant, like many others, spent time prior to his extended solo travel researching devices that would be inexpensive, lightweight, and easy to use for blogging during travel.

## **2- Acclimatization (and re-acclimatization) activities**

Solo travelers described a second set of activities, mostly after arriving at a destination, when they determined how to fulfill their basic needs, such as shelter, food, transportation, and communication and interaction with locals. For inexperienced solo travelers and those not familiar with that location, it took longer to acclimate to the area, compared to more experienced travelers or those who have been there before. Another important aspect related to acclimatization was familiarity with the local language. Solo travelers visiting non-English speaking destinations needed more time to navigate the unfamiliar context. Some solo travelers described their experiences with culture shock and ways to cope with it.

P16, a young male in his 20's from the fellowship group, reflected on his experience visiting a holy city in India and how it was different than life in the US in various aspects. He said,

“I went to this holy city, it's Varanasi, it's in India, and it's on the Ganges River, which is like this huge, gigantic river that hundreds of thousands people go per day. [...] essentially, if you die, and you're put into the river, you skip

reincarnation in the Hindu faith. And so... I don't want to say it's a city of dying, but it is. They have this eternal flame, and they basically just cremate bodies all day long. And they put them in the river. [...] And you get on a boat with hundreds of other boats, and you watch this ceremony every night. And it's really hard to describe, being on a boat, and then watching this eternal fire. You can't take pictures, you're not allowed to. But just... I've never seen bodies burn, I've never... Here, if you burn a body, it's usually done in a funeral home, and you're not part of it. You just get the ashes. But seeing a body burns in front of you burn, and it just... The big sections of bones, like the skull, it takes too long to burn, so they're... throw it in the river and so there's pieces of bodies floating past you. It's just a surreal experience that... it's almost like watching a movie, and you wait until the director says cut, and then all the actors... it's just all playing. It's so different than being here, where everything is very sterile, and you go to the bathroom and it's completely silent, and you cough and you feel you're being rude. And there, it's just a different world. It's chaos, but then after a while it starts make sense, in a very strange way.”

He (P16) explained that he had heard about Varanasi from other travelers whom he had met during travel and had read about it on the internet. Being curious, he initially traveled to Varanasi alone but he found it too disturbing that he decided to leave the town immediately. Later, he received a message from those travelers, who had told him about Varanasi, on Facebook that they are in Varanasi and asked him if he'd like to join them. P13, who was about to leave India, mainly because he was disturbed, decided to change plans and go back to Varanasi to visit it with other travelers. He (P16) said,

“I went there by myself, and I hated it. It was just... It was just too much. And I was going to leave, but then I met these seven other individuals [whom he had met in a hostel in South America before], and we traveled for a month and half together.”

Using social media to gather information about the place, referring to print guides such as the Lonely Planet, talking to locals, wandering around, and reflecting on travel and life experiences all were classified as activities that helped travelers acclimate to their new destination.

For long-haul travelers, acclimatization could also occur when they return home and find it difficult to adjust to their old social and cultural norms. I refer to this as re-acclimatizing because long-haul solo travelers discussed the difficulties of adjusting back to their old way of living and the fact that now they were expected to behave in accordance with certain customary norms and

ethical standards. A participant actually referred to his return experience as culture shock. After an extended travel, P19, a young female in her 20's, from the fellowship group, realized the importance of having someone to talk to who can understand the experience of being gone for an extended period. She said,

“I think finally my culture shock was starting to happen, three weeks after I got home. And I don't know how much other people can relate to that, and I also don't know how much they want to hear it, but with her [a friend who had also gone to an extended trip], she's going through it as well, so... That's been really nice [to be able to talk about this culture shock to her].”

She (P19) talked about the challenges of adjusting to the old social and cultural norms in her hometown and appreciated having a friend who has also experienced similar extended travel, so they could share their experiences and understand each other. She talked about using social media to stay in touch with other long-haul solo travelers who she had met over the 8 months of travels.

P18, a young female in her mid 20's, from the fellowship group, also talked about her experience returning home after an extended travel. She did not want her family know her return date and used social media to pretend she was still traveling. She said,

“I lied to my mom and got egg on my face for it, because I told her that my flight was getting in on the 19<sup>th</sup>, when it was actually getting on in the 17<sup>th</sup>. Because I just didn't- I felt like it would be- if she knew my flight was getting in, she would want to meet me at the airport, she would want to immediately take me back to my home town, and I didn't want to go; I wanted to hang out with my friends. And I thought that there's- there's no good way to tell her this, so I just say that my flight's coming in two days later. And I can't even remember how I screwed this whole thing up. But of course she wanted to pick me up from it, and um... and I eventually- I eventually- I never told her that I was actually in town two days before I claimed I was, but I eventually just told her like, “I- I don't want you picking me up from the airport, because I want to go see my friends.” So it was to the same effect anyway, but I should have known that, initially. That meant that for like, the first three days I was in the country, but I didn't want anybody to acknowledge I was here.”

The thought of returning home and living in the old social and cultural norms was not pleasant to P18, and as such, she kept her return date from her family. P18 later talked about difficulties

living with her family and that she ultimately decided to break ties with some of her old friends because she didn't have much in common with them anymore.

### **3- Exploration activities**

Once acclimated, solo travelers described various activities to explore the area such as photography, hiking, food tours, shopping, engaging with locals, and visiting museums. Exploration includes all activities solo travelers engaged in that were not bound by unfamiliarities that could take time and energy from exploring.

While exploring, solo travelers became less concerned about the unknown or uncomfortable aspects of the travel, such as safety issues or a city's cleanliness. At this point, locals and panhandlers became viewed more as conversation partners and informants rather than as threats to one's security. Exploration is the fun and memorable part of the travel experience. And naturally, solo travelers were happy to share these activities on social media and with other people who asked them about their travel. For example, P11, a 64-year-old divorced male solo traveler from the self-funded group, was excited to share his cooking experiences on the road. He said that he would message his friends over social media to let them know when he'll be in their "neck of the woods" and they would plan to meet to cook together. He said,

"I have a backpacking type stove. I have a good one you know, weight isn't much of a problem, space is a problem. Weight isn't so I have a good cookware, a small pot you know and a non stick frying pan so I don't have to pack ten things so I can make things work pretty well with those. I keep a little, I have a meat thermometer, I have a barbecue brush, I got a few little other utensils, wine openers and blah, blah, blah. [...] I'm pretty handy on the grill and I do grilled vegetables."

Contrary to beliefs that backpackers only pack essentials, this solo traveler carries several cooking tools and ingredients with him as he found cooking a great way of socializing with people and making new friends. Other solo travelers shared similar experiences; P15 (a 30 year-old, single male from the fellowship group) took a regular size skateboard, and P6 (a 38-year-old married woman from the self-funded group), carried a large camera bag with a professional camera and multiple lenses.

#### 4- Reflection activities

The final set of activities that solo travelers described was revisiting their experiences and their life in general. Solo travelers each approached this stage differently and recounted many activities to externalize their reflective thoughts, such as blogging or journaling, browsing photos, having reflective and intimate conversations with others, savoring sense of freedom and solitude, collecting and carrying small or intangible memorabilia. Buying souvenir is another example of a reflection activity even though it occurs during the travel experience itself, because it serves as a reminder of the experience (Merriam-Webster, 2017). Even though it is possible to purchase the same items online, travelers still prefer to buy it from those places and carry it in their limited space.

Some solo travelers decided to re-read their favorite books on e-readers because they found the act of reading familiar stories very therapeutic, as the books brought back good memories from home, and from those who were not around anymore such as lost grandparents or late friends and family members.

While reflection can happen at any point of travel, it was more pronounced after solo travelers returned home, when they were in a relatively stable state. Solo travelers also talked about reflecting when they were not able to connect to the internet or during long commutes or waits at the airports. Reflecting on travel experiences and sharing it with others in different forms was an important activity to most of the participants. Some participants blogged to share their insights and some used Facebook while others used various social media for different aspects of their travel. For example, deeper thoughts and scenic photos would be devoted to public blog posts, whereas selfies and fun photos and short comments would be posted to Facebook and be shared with close family and friends, while artistic photos would go to Instagram to get more likes. Participants also talked about reflecting on their experience such that they could use in their resumes or portfolio. P19, a young female in her 20's, from the fellowship group, said,

“... it was like, right when I got home. And I was like: What did I do... How do I summarize this? And then, how do I make it relevant? And so it was cool to have to write that in like, two or three sentences [in my resume]. And I do think [my travel experience] is relevant, pretty much to every job I'm applying for, just cultural- a lot of the jobs I'm applying for deal with different cultures.”

For P19, it was important to be able to present her extended travel experience on her resume and customize it to relevant jobs. She found herself using her social media accounts to track her journey as a reminder of her achievements and thought the process of reflecting on her long trip and distilling it down into a few summary sentences was rewarding.

Participants also talked about the interview process as a way to reflect on their travel. P17, a young male solo traveler in his mid 20's from the fellowship group, said, "To be honest, part of my reflection was in the last five minutes. Your question made me think about this." And P19, who I interviewed both before and after her extended solo trip said, "Yeah, I've been actively thinking about it ever since you asked me, that, when we talked before I left. I reflected on your questions."

### **Discussion of findings: Travel as Activity**

Because solo travelers decidedly manage all activities themselves, focusing on the type of their activities provided a helpful lens to understand their travel experience. This activity-based framework grouped solo travelers' technology needs such that it is a designerly problem, to be solved by designers. Classifying the travel experience by activities revealed more about what constitutes sociotechnical practices and how they could be supported by technology. This process helps direct the conversation on what is motivating individuals' activities versus the point at which they happen. Transition points emerge in these four activities when there is a change in goals or a change in activities that indicate a change in goals. For example, when an individual searches the internet to find a local place to eat authentic food, this activity is considered exploration. However, if an individual searches the internet to find a place that offers a safe food to eat because she is starving, not knowing what she can eat in a non-familiar environment, that act is considered acclimating. In these examples, the goals for searching the internet to find food are different even though the activity is similar.

Activities that indicate change of goals also occurs when solo travelers decide to stay in hostels or other shared facilities as opposed to a private hotel room. This change could indicate that they are inclined to meet new people and possibly share part of their trips with them.

Finally, this framework is designed to extend beyond the travel context because people who are stationary would also engage in those types of activities. Analyzing the data through an activity

perspective could reveal broader trends about technology usage within communities, because they happen when people don't travel too.

This framework is not intended to represent a typology of solo travel activities, or to develop a definition. Instead, my goal was to understand solo travelers' sociotechnical needs in relation to technology with the goal of exploring opportunities to design interactive technology for them. These four activities may take place while traveling with a companion or in various other contexts, such as moving to a new city for work or school, becoming a parent, changing jobs, and so on. I urge further studies to examine the utility of this framework and adapt it for use in other contexts.

### **Connecting research findings to design**

At this point in the study, my goal was to use these findings—the four themes and the activity framework, to design interactive technologies for solo travelers. As discussed in the methodology (Chapter 3), a traditional human-centered design (HCD aka UCD) design project normally consists of six steps: define, discover, synthesize, construct, refine, and reflect. Up to this point, I've defined the design project, discovered user needs through interviews, solo travel weblogs, meet-ups, and my own solo travel experience. I've also synthesized the data through coding and thematic analysis. The next step was to create personas and scenarios. It is worth noting that creating personas for a project that has only one designer and one stakeholder is not required because persona is a design technique developed to solve the problem of the *elastic user*, which usually results from having a larger design team or multiple stakeholders (Cooper, Reimann & Cronin, 2007). However, I opted to create sample persona and scenarios to guide the design process (see sample personas and scenarios in Appendix G).

Then, I began to connect the synthesized findings to the design of interactive technologies that could support solo travelers. Coupling the interview data along with my personal experience as a long term solo traveler and my participation in solo travel events and meetups inspired a myriad of design ideas. These ideas are classified in two groups, and I provide illustrative examples of how qualitative analysis in design project 1 inspired and guided them.

**Design ideas Group 1-** Interactive technologies to support solo travelers throughout their travel and act as their travel companion focusing on enhancing and enriching solo travelers experience. The qualitative analysis findings showed that solo travelers perceive digital

technology as a companion that helps maintain their autonomy and facilitates spontaneous experiences. Participants also described the challenges of finding a balance between connectedness and disconnectedness while perceiving technology as a great tool to break up with social ties and social norms. This is how the idea of Travel Sidekick was born.

### **Design example 1. Travel Sidekick app**

The Travel Sidekick app will contain several features, each based on the findings mentioned above. They include:

**Social side:** This feature connects solo travelers to other solo travelers or like-minded individuals. Social side can search for solo travelers based on location, type of activity, and other specific details important to travelers such as date and time, number of people in groups, etc. The social side feature turns Travel Sidekick into a social network of adventurous individuals all over the world. This feature was inspired by the themes 1 and 4 and is more focused, but not limited to the exploration activities. Themes 1 and 4 describe solo travelers' desire for a travel companion while at the same time, maintaining their spontaneity. The social side has an incognito feature to facilitate the desire to be disconnected when needed.

**Adventurous side:** Using gamification principles, Travel Sidekick would allow solo travelers to propose a challenge to other fellow travelers using the app only if that have gone through the same experience. For example, they can challenge someone to take a photo on top of a mountain in a remote area. The system would keep track of the users scores and rewards them accordingly. This feature is mostly for exploration activities, but it also satisfies travelers who have returned home and want to relive their experiences. Solo travelers discussed the kinds of activities that helped them relive experiences, such as browsing the photos, posting blogs, and talking to others. For solo travelers who are exploring, this feature will help satisfy their desire for serendipitous and spontaneous encounters (Theme 4).

**Journey side:** Travel Sidekick uses the photos taken by the solo travelers camera or the Geotagged photos downloaded on the individuals laptop or cloud account to create a story. It also draws content from the user's social media accounts and blogs to provide a more complete picture of the journey. Journey side would allow solo travelers to take notes on the app if they desire. It also keeps track of the songs played during the trip or books read on ebook readers. Journey side will present this information in a timeline format, where the users can touch/tap on

the timeline to see what they did on a specific time and day, whether they met anyone, their related notes, musics listened and books read. Journey side is meant to illustrate a condensed version of the travel and present it to users such that they can relive those moments.

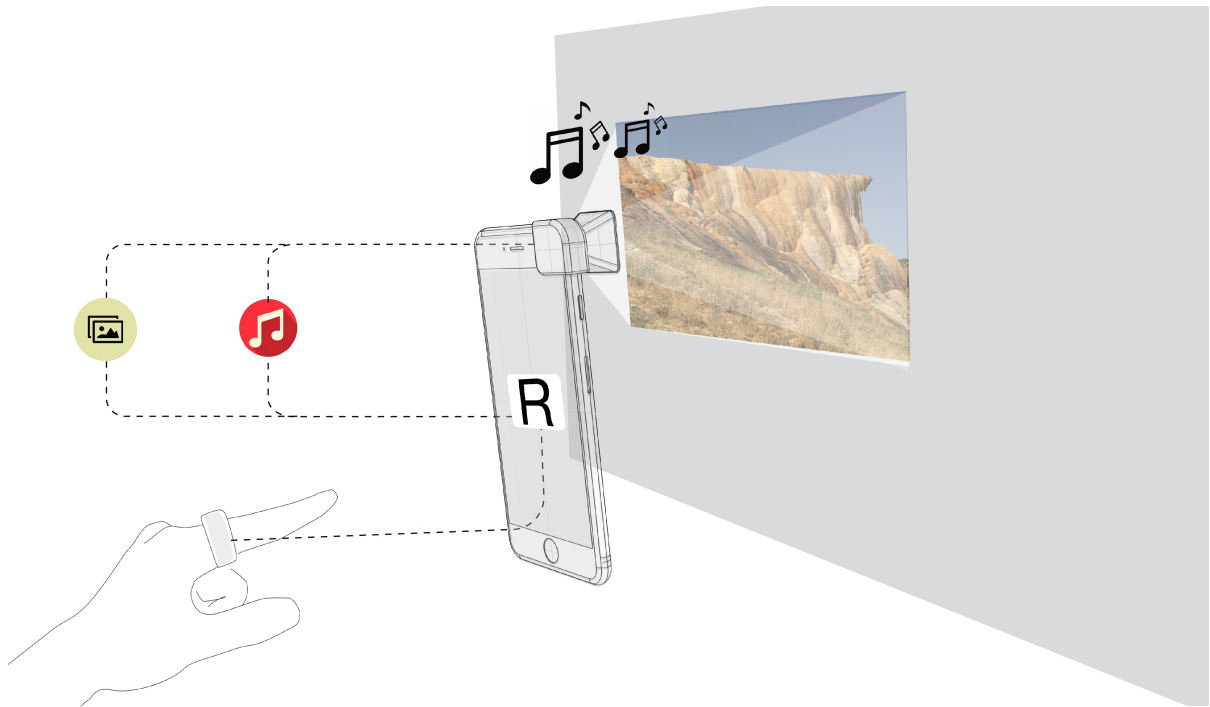
This feature caters mostly to the reflection and exploration activities, and it is particularly designed for long-haul solo travelers or those who travel very frequently so that the details of their trips would not be easy to remember. This feature also creates customized video clips from the journey that can be shared via social media (Theme 1).

**Watchdog:** Scans certain weather and news websites and social media accounts to keep solo travelers up-to-date with the events happening in the area or the path of travel. For example, if the changes in flights due to weather conditions or natural disasters such as earthquakes, floods, or storm, as well as political issues, that could impact the itinerary. This feature facilitates preparation, acclimatization, and exploration activities and helps solo travelers be spontaneous in their travel plans (Theme 4).

**Design ideas - group 2:** Interactive technologies that would help travelers with a specific type of activity, for example tools that would help travelers reflect or tools to help them explore. The primary objective for this type of tools was to support a specific group of activities as opposed to group one that was all-inclusive.

### **Design Example 2. Reflector**

As described earlier, solo travelers find reflecting on travel and life to be a valuable aspect of travel. They used various ways to reflect such as journaling, talking to others, thinking quietly, and browsing their photos. Reflector (Figure 1) is designed to help solo travelers engage in this activity. Reflector is a Bluetooth enabled smart ring that can activate the accompanying smartphone app and pico projector. The app then randomly browses through the photos while playing music from the user's music albums. Photos can be projected on the wall or ceiling using a special magnifier attached to the phone camera. This tool can be used throughout the travel and after one returns, especially for storytelling (Theme 1 and 4).



**Figure 1-** Reflector – Early sketch.

## **Design Project 1 Limitations**

While the process of coding and analysis interview data, followed by synthesizing the data with other sources (solo travel weblogs, meet-ups, and events) provided me with a deeper understanding about the solo travel experience, it was long and laborious. The interview process that took an additional year to complete, and then a few extra months were spent transcribing them. As discussed in the methodology chapter (Chapter 3), I conducted all the interviews sequentially, as opposed to simultaneously, so I could reflect on the interview data and, if needed, improve the interview protocol before the next interview. I also interviewed four solo travelers both prior and after travel, which took up to a year to await their returns.

A limitation of this approach is that design practitioners are not trained to conduct scholarly research, and as such lack the skills necessary to implement them, despite evident benefits. In addition, the extended design process goes against the principles of HCD approach, which is supposed to reduce the design time and rework for new versions, reduce training, and documentation (Earthy, Jones, & Bevan, 2001). Thus, the lengthy process I undertook in this study would not be viable in a real design project.

Another limitation of this approach is that it would require designers to read scholarly work to inform and support their processes. As discussed in Chapter 2, there is a divide between design practitioners and researchers in terms of the venues in which they share their work. While researchers submit papers to academic commons, design practitioners participate in discussions, verbal critiques, or design competitions. I also discussed the problems associated with applying scholarly research findings to design in a practical way. For designers, research findings are “too difficult to learn, too abstract and theoretical, or that they do not lead to desired results when used in practice” (Stolterman, 2008).

In the real world, this design project would be tackled as a team, and ideally, the tasks would be divided between the team members with different skills. While some larger design firms, such as IDEO and Frog, include researchers from disciplines such as psychology and sociology, the required skills change from one project to another, so finding team members who have the required skills for a specific project and can collaborate as one team introduce another challenge and complexity.

## **Design Project 1 Discussion**

Travel sidekick and Reflector were two examples of the kinds of interactive technology I had in mind while working and also after finishing design project 1. Other examples were, (1) a smart watch app that would collect Geodata and the duration of time spent in any given area and then visualize the data through the accompanying smartphone app. The app would make different customizable visualizations, for example based on the longest stay in a town, shortest stay, name, number, and location, of airports visited, borders passed, miles, etc., (2) a plugin to one of the current music apps such as Spotify and Pandora or potentially a new music streaming app that would surprise the solo travelers by playing local and folklore songs based on the Geodata as travelers visit different locations. Because this plugin collects Geodata, it could also inform the travelers if there were local music events at the time of visit.

The two data analysis perspectives (sociotechnical lens and activity framework) augmented one another to deliver insights into the solo travel domain. They provided insights into the activities of solo travelers and guided me in designing interactive technology for them. These two coding perspectives guided my ideas in two ways:

(1) I was able to think about a specific activity (exploration, preparation, etc.), reflect on how technology can support that activity, and also whether and what kinds of technology are currently available to address it. For example, thinking about how can technology support researching a new place to visit and the types of information that are needed for researching a place. This example would mostly support the preparation activities, but also would be useful for acclimating and exploring (Themes 1, 4).

(2) Design ideas generated in the previous step could be tested and validated against the four generated themes. For example, in what ways can tools help with researching an area and support solo travelers? Does it act as a travel companion, help one be spontaneous, or help one be in the moment and disconnect from the virtual world? This helped me further focus the design and make it more meaningful.

The four activities and the generated themes were useful to set priorities or the affordances that I wanted to design for. Because I started thinking about what to design prior to the analysis process, I realized that qualitative coding was particularly helpful in informing my design ideas. This did not omit the need to validate them through usability testing methods, but it meant that each design idea was initially substantiated with abundant quotes that help facilitate design idea brainstorming. Overall, the process of coding and analyzing the interview data through these two perspectives brought clarity to discovery of solo travelers' needs, synthesizing the findings, creating personas and scenarios, refining the design ideas, and reflecting on the whole design process. This approach needed extensive documentation at each step, which might be perceived as a limitation. However, as Zimmerman, et al. argue (2005), the "Knowledge generated by interaction designers is needed not only by other designers, but also by researchers and practitioners from other disciplines." The authors add that there is a need for "more refined models of design research and design research dissemination."

Analyzing the interview data through sociotechnical and activity perspectives shed light on certain aspects of solo travel, but as Strauss and Corbin (1990, p. 75) discuss, researchers code only what they see and "come to analytic sessions wearing blinders, composed of assumptions, experience, and immersion in the literature." They encourage researchers to challenge their assumptions, delve beneath their experience, and look beyond the literature to uncover a phenomenon. In Chapter 5, I further analyze the interview data using a theoretical approach, and discuss how this process led to the development of a new design model.

## Chapter 5. Design Project 2: Theory-driven design

Design project 2 focuses on the second research question, *What role can identity theories play in navigating between research data on phenomenological experience and interaction design in the domain of solo travel?* I built on the patterns observed in design project 1 to select theories that would help further interpret the data to address this research question and further examine the domain of solo travel. These new patterns and themes were discussed with knowledgeable scholars to ensure my selection of theories was rigorous.

Similar to Chapter 4, I discuss the theoretical analysis in detail and connect the findings to design through the HCD approach, after which I reflect on this approach's limitations. I close the chapter by describing how connecting the analysis of data through identity theories organized by the activity framework developed in Chapter 4, led to the development of a new design model.

### Section A - Selection of Identity theories

Connections between the issues of self, identity, and travel are long, extensive, and date back to the earliest surviving works of literature (e.g. Homer's poem the *Odyssey*). However, more systematic studies of these topics began in the 1960s when anthropologists took an interest in tourism. Several of these scholars talk about humans' desire for change and mobility, travel's impact on individuals' sense of self and identity, and how the stability of a place such as home may impede personal growth (Lean & Staiff, 2016).

In addition, Desforges' (2000) study of extended travel shows that this kind of trip is closely linked to questions that individuals have about their identities. This is particularly important because the travel industry has seen a shift to long-haul travel (WTO, 2014) as well as independent travel (US Travel, 2012), which as I discuss in this chapter, might be what Gergen (1991) describes as features of postmodern period.

There is another large body of literature that connects travel to personal transformation (e.g., Ross, 2010; Gardner, 1995; Van Leeuwen, 2007; Morgan, 2010), which includes stories of "individuals heading off on 'heroic' quests that would strip them of their worldly possessions, status and relationships, bringing them to the bare essentials of being and, consequently, transforming their thinking and behaviours." (Lean & Staiff, 2016, p. 11)

Based on a review of the travel and identity literatures, and discussions with knowledgeable scholars, I selected the following three theories to apply to this work.

### **Theory one. The Protean Self**

The protean self is a theory by psychiatrist Dr. Robert Lifton (1999) that focuses on how people develop new attitudes and endeavors in response to the constant change and instability of modern—especially Western—life. He argues that historical threats and pulls (historical dislocation, the mass media revolution, and threat of extinction) in this fragmented, contemporary world have resulted in the emergence of a new fluid individual self that he calls protean self. In Lifton's terms, instead of collapsing under these threats, the self reveals itself to be surprisingly resilient.

Lifton argues that the protean self “emerges out of confusion from the widespread feeling that we are losing our psychological mooring” (p. 1). In other words, modern man has been torn from his spiritual moorings. Confusion is due to unmanageable historical forces, societal and economic changes, and social uncertainties. Lifton highlights that frequent changes in jobs, residences, ideas, and partners have resulted in us becoming ‘fluid and many-sided.’

Proteanism is about individuals' ability to re-create themselves when exterior conditions demand it. The term itself is derived from the Greek God of sea, Proteus, who would change shape to respond to external threats. Protean individuals are shape-shifters because they try different identities and adapt to various context when they feel the need for it. Shapeshifting, trying out different identities, and adapting to different contexts are all key features of a protean self. In Lifton's words, proteanism is, “a balancing act between responsive shapeshifting, on the one hand, and efforts to consolidate and cohere, on the other” (p. 9).

Lifton (1999) argues optimistically that despite the turbulence and disarray in the world, people can embrace change for good and to save our species. Lifton is hopeful that we can transform and assert our organic relationships to each other and to nature. However, such transformation involves personal choice and effort, and the protean path is taken only when we're open to change and respond positively to the lack of bearings in our world.

### **Theory two. The Saturated Self**

Saturated self is a theory by Dr. Kenneth Gergen (2001), an established postmodern theorist in the field of psychology. Gergen analyzes how the social construction of self has developed and

changed from the Romantic period through Modernism to Postmodernism. He discusses the views of the essential self held in the Romantic and Modern periods and contrasts them to the views of dissolution of the self in Postmodernism.

Gergen believes the long period of individualism in Western culture stands in contrast to the more collectivist Eastern systems and argues that it is hard for Westerners to imagine a different perspective in their lives. However, Gergen's observation is that the boundaries that separate the self from others seem to be increasingly challenged due to the advances in technology and the internet. Social media and virtual connections have led people to find themselves in groups, institutions, and identities of people all over the world. Gergen believes that these social relationships play an important role in creating a sense of self in postmodern life, but he cautions that that these relationships can overburden individuals with multiple selves because one can have multiple types of relationships. This social saturation is changing the way we understand the self, and Gergen argues that the social saturation and immersion in multiple selves has led to social exhaustion, which is a prime factor in the development of the postmodern movement.

In postmodern world, individuals play many different roles and find themselves in many different identities. As a result, Westerners find themselves talking more about different roles they play and less about a consistent self. Gergen argues that postmodernism is partially a result of advances in technology because it has dramatically accelerated our social connectedness. Gergen makes a case for the dissolution of the self in postmodern times and notes that postmodern persons "exist in a state of continuous construction and reconstruction." Postmodern individuals live in a world where anything can be negotiated and each reality of self gives way to reflexive questioning, irony, and probing another reality. Individuals may inscribe, erase, and rewrite their identities as the ever-shifting, ever-expanding, and incoherent network of relationships invites or permits.

In the modernist perspective, as the world becomes more fragmented due to changes in employment, urbanization, partnerships, etc., White & White (2004) indicate that individuals start to feel alienated from society and try to overcome this sensation through travel. Individuals hope that they can *discover* themselves while seeing a bigger picture of the world and that there is more to life than the repetitive routines of everyday life.

However, in postmodern time, self is less something to be discovered than it is something to be actively constructed through practices, such as traveling. Many scholars discuss this shift from a

static, discoverable self to a self that is fluid and constructed. For example, Giddens (1991) writes that self-identity is not a distinctive trait or even a collection of traits possessed by the individual. It is the self as reflexively understood by the person in terms of his or her biography (Giddens, 1991). In other words, the individual faces multiple possible selves. This openness to multiplicity has much in common with Lifton's concept of protean self. Lifton notes that the image of Proteus is reflected increasingly in contemporary life-style. The protean style is characterized by a continuous flow of being, without obvious coherence through time. Experimentation with being, risk, and absurdity are all characteristic of the protean style. This emerging pattern is "a matter of the radical experience of equally real, but mutually exclusive aspects of the self. Personal identity cannot seem to be fixed. The person experiences himself as many selves, each of which is felt to have a life of its own, coming and going without regard to the centered will of a single ego" (p. 249).

Gergen (2001) further discusses the role of technology in relationships and states, "through an array of newly emerging technologies the world of relationships becomes increasingly saturated." Gergen points to the variety of forms and intensities in current world relationships compared to pre-internet era. He argues that the increased attraction to Eastern mystical philosophies of quietness and reflection, and nostalgia for simpler past is characteristic of postmodern time. He believes that the process of social saturation is producing a profound change in our ways of understanding the self.

### **Theory 3. The presentation of self**

Building on a metaphor of theatrical performance, Erving Goffman (1978) resembles our lives to actors' performance on a theatre stage. In his book, *The Presentation of Self in Everyday Life*, Goffman argues that we put on different masks or performances for different audiences because we would like to leave specific impressions on those audiences. So, we wear different masks and present ourselves differently to our superiors or coworkers than to our family members or in intimate relationships. Based on Goffman's dramaturgical analysis, the way we talk, dress, act, decorate our homes, drive, and all other acts that involve one or more people, are attempts to guide and control the impression we'd like others to form about us.

Goffman highlights the importance of maintaining the appearance one has created over the course of years, which seems to undermine other traditional views of self. In other words, our internal feelings and thoughts are less consequential because they do not play a part in our

interaction with others. Goffman (1978, p. 56) writes, “the expressive coherence that is required in performances points out a crucial discrepancy between our all-too-human selves and our socialized selves.”

While the Goffman’s theory originally seems to connect with the protean self—as we constantly change who we are, and who we present our self to be depending on the social interaction—Goffman’s theory differs from Proteanism in terms of “performance” versus “real self,” especially when it comes to people without an established “self.” In the course of molding the creation of self, what part of an individual is the mask and what part is real? Is being aware of different types of audience and acting accordingly based on their needs and expectations making us dishonest or disingenuous?

Goffman’s book was written in the 1950s when societal norms in America were in complete upheaval. Within that context, theorizing that people were all playing parts because underneath was the strong undercurrents of change are understandable. Similarly, in today’s world, social networks have a strong performance motif where everyone plays a certain part designed for maximum acceptance by his or her “audience.” This view matches Gergen’s observation that as individuals continue to be exposed to different cultures and diverse ideas, especially with the help of the internet and new technologies, the boundaries that separate self from others are increasingly challenged. Gergen argues that in current world, the self has become more complex and the views of a core or essential self are challenged.

## **Section B - Solo Travel through identity theories**

In this section, I used these three theories to analyze the interviews. The initial open coding process and design project 1 showed that analytical lenses could play different roles for different activities (preparation, acclimatization, exploration, reflection). Therefore, I decided to organize the analysis of data in this chapter based on the grounded activities generated in DP1. This way, I could see, for example, what do identity theories mean when solo travelers are preparing for their travel and how is that different than exploring or acclimating, or reflecting. Within each group of activities, I began my analysis by first considering how solo travelers engage in these activities without using technology. Next, I illustrate the role of technology in supporting these activities. Finally, because not all solo travelers experienced identity theories the same way, I describe the differences between individual solo travelers at the end of each activity, if

applicable. Framing my analysis this way helped highlighting the needs of solo travelers that are not currently supported or satisfied by technology, which played an important role in applying these findings to the designs.

### **1- Identity theories and preparation activities**

Travel starts in one's mind before the physical travel takes place. Traveling has changed in many ways since Arnold van Gennep (2011) studied rites of passage in early 1990s. He stated: "Except in the few countries where a passport is still in use, a person in these days may pass freely from one civilized region to another. The imaginary lines connecting milestones in an exaggerated fashion is visible only on maps. But not so long ago the passage from one country to another was accompanied by various formalities" (p. 15).

Twenty-first century travel, especially with recent political upheaval, travel bans, and strictly enforced borders, has been accompanied by a wave of formalities. Now, traveling abroad is a privilege, and "only people who circulate close to the top of the global power pyramid can freely use international flight paths and freedom to move and freedom to choose is unevenly distributed" (Bauman, 2013, p. 2).

Crossing a border is a liminal act and may be considered the first step toward physical detachment (separation) from one's homeland. It is a detachment from current social structures (e.g. student, employee), from a set of cultural conditions (color, ethnicity, religion), from family and friends, and perhaps a mental detachment from all one would like to leave behind.

As described in Chapter 3, participants in this study are American travelers, and they use sources such as US Travel state to determine whether political, legal, or economic formalities are used at their destinations to prevent them from passage. Travelers would situate themselves in contexts other than their own country, thought about how to navigate limits and constraints, considered models of citizenship, decided whether to apply for travel visas, and thought about how they would be treated in other places. Travelers think about their identity and what it means to be an American in a foreign country. This new personal identity brings other aspects of travelers' identity to the fore, which that can influence their decisions on places to visit. For example, would they like to go to a country that has political issues with the USA, are they welcomed in those countries? Are they going to be safe? Should they conceal their identity when talk with locals? P13, a 38-year-old single male from the fellowship group, said,

“I’ve heard some Canadians wear red maple leaf [shirts] or sew their flag on their backpack so not to be mistaken for Americans, umm, because you know, some countries think Americans are rude and disrespectful or, you know, we are obnoxious. I’ve seen blogs offer tips on how to pretend you’re Canadian. [laughs] Should I be worried about being American in certain countries umm because of our reputation?”

For many participants, especially those less experienced in travel, seriously considered the way they’d present themselves to the rest of the world as they were planning their trips. Goffman’s (1978) dramaturgical view of the world as frontstage and backstage focuses on such situation. The travelers see themselves as actors playing for a foreign, and mostly unknown audience, and while in the backstage (preparation), they design their clothing, write the scripts, and think about their body language. In other words, these travelers figure out a way to present an “idealized” version of themselves rather than being authentic, and in Goffman’s words, “the impression fostered by the performance is knowingly contradicted as a matter of course” (1978, p. 112). The quote mentioned above from P13 shows that (solo)travelers use the internet to learn about presenting themselves under a Canadian “mask,” and other travelers or news media have posted tips and tricks for American travelers on how to identify themselves while abroad—for example, CNN (Cripps, 2013), and *The Atlantic* (Nyce, 2016).

From Lifton’s (1999) perspective, finding a way to resolve an unfavorable issue, as opposed to letting that stop them from traveling to various countries, is a protean attitude. For the quote above, the individuals change “shape” and become Canadian in order to diffuse perceived threats in foreign lands. This shapeshifting includes self-directed behaviors enacted by these travelers to maintain their idealized identity. Goffman (1978) highlighted the importance of maintaining the appearance to create a coherent sense of self. For American travelers who identify as Canadians, they find it difficult to maintain their idealized identity when they meet someone from Canada or when others can spot their American accent.

Participants also talked extensively about being perceived as a “clueless tourist” in foreign countries and trying to find ways to camouflage and blend in those countries. For example, P18, a young female in her mid 20’s, from the fellowship group, said,

“In areas that are heavily touristy, people... they see someone who looks like me, and they really see me as more of a financial opportunity, than someone who like, wants to get to know them. [...] Like “Here, let’s show you a thing that’s

special to us.” It’s like, “Oh, you’ll love this, because you’re a tourist, you’ll want to go lay on this beach.” You’re just- that’s going to be your favorite thing, and it usually wasn’t so... it was frustrating.”

And P16, a young male in his 20’s from the fellowship group, said,

“I don’t want to look too much like an outsider and I am a visitor of course and I can’t hide that, but I don’t want to be the typical American tourist. I want to actually be a part of the culture and you know go to the local pubs and eat at the local places and not do the touristy things and so I think like the big backpack and the big maps and everything kind of gives off that stereotype of I don’t know, a traveler that goes somewhere and says this is really cool and then they leave and they don’t soak in any of the culture, and I want to be someone who is there learning about the history and I want to know more.”

In addition to the political and geographical issues mentioned above, participants discussed internal conditions for their decisions to travel solo. Several scholars consider recreational travel to be a psychological experience that resides in an individual’s mind (for example, Iso-Ahola, 1981; Kaplan, 1984; Mayo & Jarvis, 1981; Pearce, 1982). As a psychological experience, variables such as personality, interests, activities, and opinions are important in the deciding such as travel destination, direction, distance, frequency, and of products and services. Therefore, it is important to discuss travelers’ motivation as an important determinant of recreational travel that impacts travel plans, such as direction, distance, and frequency.

Participants described personal issues, such as breaking up with their partner, being in transition from graduation to work, surviving a long battle with health issues, having more freedom after children left home, dissatisfaction with current jobs, getting retired as their motivations to travel solo. These built upon other motivations such as relaxation, and change of pace, climate, or environment. Chon (supported by other scholars such as Hudman, 1980, Tocher, 1971; Kaplan, 1984) encapsulates all travel motivations into two factors:

- Push factors: mostly derived from Maslow’s hierarchy of needs and are motivations such as need for self-esteem, need for recognition and status, and need for belonging.
- Pull factors: the attractiveness of the destination or the journey in general.

While these factors apply to all recreational travelers; solo or groups, some studies show that the tendency to go on a solo trip is greater following personal failures than successes (Cialdini et al.,

1976; White & White 2004). This suggests that individuals may be more likely to embark on recreational travel after a personal experience such as ending a relationship (Lean, 2014), death of a partner (White & White, 2004), or the end or anticipated end of good health (White & White 2004). This research matches solo travelers' interview disclosures. Additionally, they also view travel experiences as an opportunity to improve one's intra- and interpersonal esteem (Cialdini et al., 1976; White & White 2004).

Taking an active role in managing life's hardships, especially due to sudden and unexpected incidents, like the death of a loved one is a protean attitude, where individuals take attempt to transform the situation into something more favorable. According to Lifton (1999), making such decisions to manage life incidents stems from individuals' clear sense of personal identity that guides decision-making.

For long-haul travelers, the White and White 2004 study shows that the degree to which people felt disengaged from meaningful social networks (e.g., family, friends, or community network) positively influences their decisions to undertake long-term travel. Some solo travelers find long-haul travel as a way of grieving and distancing from a way of life that had ended, or other changes in family circumstances.

These studies suggest that individuals are more likely to travel solo after hardships than to travel in groups, but it does not mean that all solo travels are because of personal failures and hardships. Individuals also pursue solo travel to get through their problems, boost their self-esteem, and reconstruct their sense of self.

Travel, either solo or with others, takes place in a social context from the very beginning. As Iso-Ahola (1983) notes, "people function in social environments, which they influence; and which influence them. Since this social influence process implies change, the effects of social factors have to be analyzed as a function of time as well."

The thoughts of searching for a "core self" by disconnecting from the social ties and escaping the "social saturation" through solo travel provide an option to these individuals to construct selves away from the "cacophony" of competing relational selves (Gergen, 2001).

For many (solo) travelers, the first step is to decide where to go, which primarily stems from their motivation, as discussed above. Word-of-mouth has traditionally played a significant information source for travel and tourism (several sources such as Yoo & Gretzel, 2012). Iso-

Ahola (1983) discusses the importance of one's immediate social environment on a decision to travel. In one of his studies, he found out that "persons who are regularly exposed in their communities to the park-going travel of neighbors are more motivated to personally initiate similar activity than those residing in places where park-going is relatively infrequent."

As P13, a 38-year-old single male from the fellowship group, said:

"I had a couple of friends who had, fairly well traveled, not as much as I have been now [laughs]. But a couple who had been well traveled, one is very wealthy because his dad flies into Asia so he has been all over to Southeast Asia. But he would tease me all the time because I did not even have a passport. So part of the desire to go off and do this trip was ... to rub [my passport] in my friend's faces, 'Remember when I did not have a passport. Well, look at the stamps that I have now. Let's compare.'"

This example reveals how this participant's motivations to travel (push factor), have been influenced by his friends, as part of his social network. It illustrates how social competency (how one is regarded by his peers) can impact travel decisions. This speaks to Iso-Ahola's finding wherein this participant is exposed to some friends who are well traveled, thus sparking his desire to do the same.

International travel also reflects an individual's social environments. Traveling to a foreign country is considered to be a successful behavior, because it reflects a person's capacity (money, language skills, courage, and good judgment of priorities in life) (Iso-Ahola, 1983). This participant, perceived international travel to be expensive and after he traveled extensively, he sees himself as superior to his wealthy friend who needed financial support from family to travel. It also elevates this participant's status in his social setting (Goffman, 1978).

This leads to two more important dimensions, (a) how one is seen by others (especially by one's social networks), and (b) aspiring to higher social status. As Cooley (1992) indicates, the role of others' opinions of is important in shaping the self-concept through social interaction. In Cooley's terms, significant others constitute a social mirror into which the individual gazes in order to detect their opinions toward the self. These opinions in turn, are incorporated into one's sense of self. The self becomes what we imagine others think of us, including our appearance, motives, deeds, character, etc. The quote from P13 highlights the importance of his imagined appearance to his well-traveled friends or as Cooley calls it, his looking-glass self.

Attention to one's appearance also conforms to Goffman's model of human interaction. Goffman delves into the interaction within tightly knit social fabrics and is particularly attentive to the performative characteristic structure of society and writes, "Life is a stage and we all play our part." P13 aspired to a higher status, and that motivated him to take travel—even more extensively now than his friends. He traveled in order to enhance his esteem in the eyes of his peers (Cialdini et al., 1976). This is what Goffman (and Veblen's theory) describe as "aspiring to a higher social status, eventually becomes an emblem for that status."

### **Role of social media in preparation**

Travelers not only share their experiences with close friends, they also post content on social media. Several reports and studies show the impact of social media on travel decision-making. For example a compilation of statistics for the Tours & Activities Sector shows that 92% of consumers trust earned media, such as social media, word of mouth, recommendations from friends and family, above all forms of advertising. Also, one out of three U.S. travelers reference social media as the main source of travel ideas and inspiration. In a 2013 poll by Travel Weekly, 80% of respondents reported that they have Facebook accounts, and 52% said seeing a friend's travel pictures on Facebook (or other online social media) inspired them to book a trip. Only eleven percent of the respondents reported not using social media. This confirms Iso-Ahola's (1983) study discussed above regarding the impacts of being exposed to other travelers in making travel plans. The influence of social media on travel decisions was apparent in my interviews as well.

As P9, a single male in his 40's with a PhD degree from the self-funded group, said:

"I go to Tripadvisor and WikiTravel guides and I read blogs, and I asked people who have been to Brazil, I asked Brazilians, and people who just traveled to Brazil. I sort of asked around. This is what I do for big trips like this. And I sort of get in my head an itinerary, and then I think about the feasibility of it. ... I check all kinds of sources and I also read a lot of places you can visit, specific sites, hotels, airlines. Reading reviews of these kinds of things can get you sent in to all sorts of different directions and other sources. It is now so easy to do with the internet I mean I remember, I don't know how old you are, but I remember pre-internet it was more difficult to really have an informed trip."

Also, P12, a single 26-year-old female from the fellowship group relied on TripAdvisor, especially the forums where she could ask questions or read other travelers' questions and reviews. She said,

“I used the internet a lot. I read travel reviews. I used Lonely Planet and TripAdvisor. You know when I was trying to find places to stay and the internet you know for a lot of like email introductions and then some of those were done also on social media so I met people there, introduced me to others on Facebook so those were my main pool.”

And when I asked why reading travel reviews on Reddit, she (P12) responded:

“The posts on Reddit are more honest. I feel like maybe they just seem like more emotional and personal as opposed to I feel like the Lonely Planet is more of like advertisements, not actual advertisements but people soliciting direct advice or help. The Reddit stuff is this is my experience and I want to tell people whereas the Lonely Planet is like looking for travel partners or we took this company and it sucked or where can I rent a four by four you know, whereas Reddit feels more like at least some stories or more personal I guess.”

These three quotes illustrate how solo travelers utilized social media and consumer-generated media (CGM) for travel planning and that their decisions were influenced by others both in their social networks and strangers on the internet. Access to online information and social networks shapes travel destinations, but also impacts the early stages of constructing and defining selves. As Gergen argues, these social networks highly influence how they understand themselves. (Gergen, 1991)

### **Travel & Transformation**

In addition to the issues of self and identity as described above, participants described their desire to change and escape from mundane daily routines in a quest for finding new meaning in life. P5, a 30-year old single female from the self-funded group who had traveled solo for over 5 years, said,

“When I was 24 and thinking about travel, there was this adrift feeling, this feeling that I was not entirely sure of my place in greater context in the world in my everyday life. I'm from like a super poor family so we were definitely lower socioeconomic status and [travel] wasn't something that I was ever told that I could do, that I should do, that people like me could do and so I wanted to be a little adrift to provide some of the inspiration ...”

She (P5) expressed a desire to break away from her social norms and to “be a little adrift” in a way that could inspire other women from same background to consider travel as a way of realizing their place in the world. She blogged extensively, used various social media tools such as Facebook, Twitter, and Instagram, and actively participated in travel events as means to help other women see the benefits of travel and to inspire them to travel solo. She also used online publishing services to self-publish a book as a guide for other solo travelers and especially women. Her book was available to buy on Amazon and crowd-funding websites. P13, a 38-year-old single male from the fellowship group, said,

“I was always doing different stuff and I felt like I did not have a place in [city’s name]. I was always daydreaming about what it would be like if I lived in London, or what it would be like if I was from Paris or Amsterdam. [...] All I really wanted to do was I wanted to separate anything attached to my childhood, anything attached to my adolescence. I stopped talking to my friends in High School; I stopped spending time with my family. [...] I did not want to have to do anything with my past. [...] Part of the desire to go off and do this trip was to realize a childhood dream and to restart my life and kick start my life.”

P13 had reflective thoughts throughout the interview process and asked me to share the interview transcript with him because he was actively thinking about writing a book to share his travel experience with others. He had started posting snippets of his 8+ months solo travel on social media to get a sense of what his readers would be more interested in. Using Instagram, he would post the snippets along with a photo taken from that particular place on his trip. Participants explicitly talked about their desire to change, a search for a new meaning in life, and the notion that the world is bigger than what they experience everyday.

An expression of detachment from an earlier life strongly appears in both quotes. Both participants question their current social and family traditions and talk about their desire to break away from their “given” statuses and move toward an unknown future. This is an important step in reversing or temporarily dissolving social institutions, where continuing traditions may become uncertain. For Gergen, this desire to change “demands a new orientation toward self, one that removes traditional goal of “stability of self” (self as object) and replaces it with “change of self (self as process).” This attitude is also known as “mutable self” where the individual “possesses an openness to the widest possible experience,” characterized by tolerance and flexibility. (Gergen, p. 153-4)

Feelings of uncertainty during periods of transition before and after a trip has been described as “betwixt and between,” the status of being not here, not there. The dissolution of order during this phase creates a fluid, malleable situation that enables new institutions and customs to be established (Turner, 1987).

These interviews reveal feelings of unbelonging and the desire to leave home, but they were oriented positively, such that they wanted to “kick start a new life” and “inspire others.” This is the kind of unbelonging that Rogoff (2001: as cited in Andrews and Roberts, 2012) defines as “an active, daily disassociation in the attempt to clear the ground for something else to emerge” as oppose to unbelonging as being at a loss.

In addition, participants talked about shape shifting and a desire to try out different identities. They hoped this would happen by placing themselves in different contexts with unfamiliar cultures. This openness to multiplicity and trying different identities is what Lifton considers as features of a protean self.

Another feature of postmodern persons is a ceaseless drive toward overcoming traditional way of life and the dissatisfaction with the modern views of *progress*. As Gergen writes, “The enchantment of modernism derives from its promise of progress, the belief that with proper application of reason and observation, the essences of the natural world may be made increasingly known. The belief of human progress has long been a fixture of Western tradition” (p. 231). The quotes above show that one motivation for solo travelers was questioning one’s path in life. Other interviews specifically address this issue further:

“I’ve always followed this really rigid life path, like I’ve always done the right thing. Like I was a smart kid and then I went to college and did well and then got a job and then I went to law school and then I kind of saw my life just happening in this like, this is what you do and you do and you finish it and you go onto the next step and I was like, I’m going to go to law school and then graduate and then get a job and then get married and then have babies and like kind of freaked out and saw like this life unfolding for me, but I wasn’t really ready for.” P12 (a single 26-year-old female from the fellowship group)

For P12, the life path he sees ahead of him is not appealing, and he sees travel as a way to break away from this routine. P14, a 27-year-old male PhD student, said that the fellowship he received provided an acceptable way, from his family’s perspective, to break away from his social norms and the “rigid life path”, to explore other ways of living. He (P14) said,

“I’m from Indiana and it is very conservative and you have this established life pattern where you get out of high school you go to college you get out of college you get married you get a job and you umm children you know, and taking a full year off from a paid PhD program that [my family] may not be happy with me for doing that to just go travel for awhile uh, was kinda veering off from that and it is also a bit scary.”

Despite his strong desire to break away from his social norms, even temporarily during the travel, he (P14) used social media and internet phone services extensively throughout his travel and specifically during the first month, to connect to his family and friends. After the first month, he reconsidered the amount of time he was spending on the internet to connect with his family and his girlfriend (explained in details in Chapter 4, in the finding section for Sociotechnical practices).

Research suggests that travel may help overcome alienation from society and traditional ways of thinking because it shows a bigger picture of the world and the individual’s place within it (White & White, 2010; Adler, 1985; Smith’s 1978). Jeffrey Kottler (1997), a psychologist and writer who studied travelers of the 21<sup>st</sup> century notes that no other human activity has greater potential to alter individuals’ perceptions of the way they chose their lives.

For many first time solo travelers on long trips, decision-making is arguably the most difficult part. Fear of unknowns, the anxiety of being alone for an extended time, and convincing their families to offer support are all major steps.

“I remember the panic attack. I got like one major panic attack in my life and it was the week before I was leaving. It was the one that was just my first one, the massive and daunting to think about traveling for a year all alone, I think of the enormity of it before I left.” P5 (a 30-year old single female from the self-funded group who had traveled solo for over 5 years)

She (P5) was able to get over her fears and traveled solo for over 5 years. Her blog extensively described her feelings of uncertainty and how she was able to overcome those feelings. She also wrote articles in the travel section of New York Times. Giddens (1991) refers to times of anxiety and opportunity as fateful moments that serve as significant points of transition in people's lives. In these times, reflexivity is heightened because decisions have to be made about the self and self-actualization that will have repercussions for self-identity and lifestyle in years ahead (p 112–114). In all three quotes above, travelers had reached to a point where they felt they needed to

interrupt their lives (seemingly successful lives through the eyes of the society) and take trips to provide more insight into their identities.

This begs the question: What is the ideal environment for the protean and saturated self to reconstruct his or her identity and find new meaning of life?

Desforges (2000) discusses the importance of unfamiliar places in the construction of identity. He notes that the increasing familiarities of Europe mean this is no longer a place where “oppositional identities can be articulated” because they start to feel like home. Munt (1994) talks about the role of visiting “alternative” places in “3d world countries” in the construction of new middle class identities. He argues that in these countries, travelers’ strength of character, adaptability, and worldliness can be performed and narrated, particularly among young travelers. P14, a 27-year-old male PhD student from the fellowship group, said,

“I have studied a lot of international studies. I had a lot of stereotypes of what it would like to be in the West Bank or Israel or Egypt or India, those countries that have a certain type of stereotypes.”

He (P14) was motivated by his external conflict graduate studies and chose countries based on their historic or current conflicts like Nepal, India (Caste system), Cambodia, Israel & Palestine, Vietnam (war related conflicts), and Thailand. However he was hampered a bit by certain stereotypes and fears. While considering himself different than most people, he is compliant enough to take advice and unnecessarily make his trip more complex by bringing multiple phones, a security backpack chain, a keyboard for faster typing, and staying away from locals in certain places. This caused a certain distance from his travel experience and led to a vague dissatisfaction at the end when it turns out not to be the life altering experience he had envisioned. He reflected on his travel throughout his 8+ months trip and self-published a book one year after he returned to the US.

In addition, Desforges (2000) adds that in touristy places, one’s experience is shaped the tourism industry rather than defined by the traveler. White & White (2010) argue that traveling to uncomfortable, rugged, sparsely populated lands “mirrors the need for physical and psychological distance and space.” It offers space for self-redefinition and is “a quest for nascent or emerging identities.”

This connects to what Gergen argument about increased attraction to Eastern mystical philosophies that prompt quietness, reflection, and nostalgia for a simpler past as features of postmodern time. In this research, several participants talked about traveling to Eastern countries in order to practice yoga, meditation, or similar activities. They explicitly talk about the desire of visiting unfamiliar areas. For example, P1, a single 23-years-old female college student from the self-funded group said,

“Europe was amazing, but I wanted something to me that wasn't familiar. Europe, there are so many similarities between here and there. In terms of living styles and stuff like that. So I wanted to have a completely different experience, something that I haven't experienced before. And that is why I chose South East Asia.”

P5 was a 30-year old single female from the self-funded group who had traveled solo for over 5 years. She said,

“I only had been to Europe, and I didn't know what a year was going to look like [in Africa], so it's the unknown, the uncertainty that I think is super fearful... just started like, you know, because I think we don't have the culture in the U.S. that we talk about it. So what it was going to look like was completely unknown to me.”

Both participants talk not only about traveling beyond the West, but about wanting to separate from familiar social and cultural structures by staying away from Europe or modern countries and by embracing different and unknown experiences. Turner (1987) states that liminal spaces are characterized by uncertainty and contingency. Certain indicators of liminality in these unknown places include eating different food, wearing different clothing, participating in yoga and meditation classes, communicating by language, wayfinding, and more. Liminality invites travelers to think and see things differently by questioning and critiquing their own social culture, values, and assumptions.

Exposure to new and novel experiences helped participants rethink about their own perspectives. According to Gergen, being open to other worldviews helps a postmodern person become aware that “our saying lack foundation in either passion or reason, and as our commitments slowly reveal themselves as postures, we can scarcely avoid a sense of deep humility. We can hardly advocate our own beliefs, reasons, and passions above all others, for the effort attest the hollowness of their bases.”

Kegan (1998) similarly argues that the mental demands of modern society prepare us to resist our tendencies that what is familiar is right or true, while what is unfamiliar is false or strange. By being open to the unfamiliar and the unknown, travelers can rethink their way of understanding, decision-making, personal preferences, and realize that their ways are not superior. Kegan notes that in the process of developing our own meaning system and worldviews, we are able to re-evaluate the beliefs we inherited from our cultural systems, rather than being captivated by them. Openness to new and unknown experiences helps travelers become fluid and many-sided, which according to Lifton, are necessary markers for self-development. This new mode of being is characteristic of a protean self. Both Kegan and Lifton link these perspective shifts to initial confusion and changeability of modern life.

Preparing for these new experiences is not merely limited to activities prior to the travel. Travelers constantly think about their next move, about feeding themselves, accommodation, and sightseeing. Returning home after an extended trip also required a lot of planning because coming back to old ways of living and social structure proved to be very challenging. P18, a young female in her mid 20's from the fellowship group, described her experience returning after a long trip,

“My family’s just intensely weird. But, yeah. I was out [at my mom’s house] for two weeks, working on property, and then came back. And then like, the day after- well, first of all, like, my boyfriend didn’t even pick up the phone. And, yeah. That was like, two days later, that everything exploded in public, but ... And then after that, I was just spending most of my time at my- my mom’s property; I had a tent on the yard, and was trying to get a job. My mom and I have a *weird* relationship. It bothers me. She’s vicariously living through me, and I don’t like that.”

Through social media, she (P18) found out that her boyfriend had broken up with her and was dating her old friend. She talked about how finding out through social media was a more gentle way of getting the news in comparison with finding out directly from her boyfriend or her old friend. She also thought that social media made it easier for her to explain the breakup because all her friends found out about it at the same time as she did.

Lastly, these three identity theories did not play different roles with regards to solo travelers’ use of technology for preparation activities. Although the senior solo travelers spent less time on social media for preparation activities, they said they use social media less often in general.

Other preparation activities, like when individuals' quit their jobs, sell their belongings, and cut their social ties before they embark on their travels are also worthy of future exploration, but landed outside the scope of the present study.

## **2. Identity theories and acclimatizing (re-acclimatizing) activities:**

During preparation activities the individual moved through several thoughts, emotions, reasoning, and decision-making processes. Each traveler starts their journey in a different state of mind and preparation. Some individuals lay out all their plans, while some leave it open; some are prepared to be transformed, and some do not think about it.

The physical, or corporeal, act of travel is the intervening liminal period where travelers move through cultural or social structures that have a few or none of the attributes of their original structures. Travelers are then removed from their normative social structure and are temporarily undefined. As temporary outsiders, travelers bring in a geographical and symbolic separation with them. In Turner terms, this removal and separation can *weaken* travelers because “they have no rights over others. But it also liberates them from structural obligations. It places them too in a close connection with non-social or asocial powers of life and death.” So, by being physically removed from the geographical location in which their subjective realities have been internalized and continually reaffirmed, Lean (2014) argues, that travel offers the potential to disrupt the elements that help maintain those realities. These sentiments were illustrated in interviews with solo travelers. For example,

“The Iceland airport, where everyone was speaking Icelandic, was when I first realized what an accomplishment this was and what I was starting. I was terrified and nervous when I left but this trip was one of the top three emotions in my life.” P13 (a 38-year-old single male from the fellowship group)

And the experience and feelings at the airport immediately after landing,

“Landing in Amsterdam was a rush of emotion. I could see the culmination of my lifelong dream to travel overseas and it hit me so hard at the airport. Amsterdam was also where my plans completely changed. I was supposed to stay in Amsterdam for just a weekend, but I stayed there for two weeks.”

Airports are liminal landscapes that one must pass through to get inside a country. Systems of surveillance and control at airports might be considered as obstacles, but airports might not be the type of social transition supported by liminal rite of passage in a general sense. However,

these two examples illustrate how quickly the emotional rush of being in a foreign place hit these solo travelers. This is even more important considering that airports generally have signs in English and follow some universal design conventions to facilitate travelers' navigation (Lloyd, 2003).

After passing through the airport (or the land border), solo travelers are exposed to alternative realities in which they engage in different navigation activities. A traveler is not a static body moving through places, but rather is influenced by every encounter with people, new foods, cultures, traditions, and challenges. Travelers engage in roles and performances often not available to them at home. For example, communicating with strangers without knowing their language, educating locals about their own home country and culture, figuring out how to find food in unfamiliar places, are all important activities that impact travelers.

Participants adapted to the host culture in different ways. For example, P14, a 27-year-old male PhD student from the fellowship group, said,

“The first week or so, it is awesome and I am here, and it is amazing, and it is like a holiday vacation. But then you realize that whoa, this is serious, I am here, and it is brand new and I have to adapt, and uh you hit culture shock. Then you yearn and desire things back home. The comfort of things back home. You end up like, that kinda of happened to me.”

For this participant, the yearning and the desire for the comfort of life back home was pretty strong. He (P14) initially escaped to the internet to cope with the culture shock and said,

“I was going back to like emails and Skype a lot, every day, a few hours a day sit in my hostel a lot of time on the internet. And that lasted maybe 2-3 weeks. Um, and then I realized it was detracting from my actual experience so I started like uh, you know filtering it off, using internet less, and doing more day adventures.”

After about one month into his trip, P14 found a way to adapt and immerse himself in the travel experience as opposed to comfort himself through connecting with friends and family back home.

Travelers in this study took different paths and engaged in various different activities. A female participant (P2) who was biking through South America at the time of the interview with no definite plans to return to the US, said,

“Maybe for about eight years it was always my dream to cycle long distance but I was never sure how far I would make it. I thought I would just go and see how far I could make it and I'm in Peru, a year and four months later so. And my idea is just to keep riding as long as I love it and then when I don't love it anymore, I'll stop and it seems like the harder it gets, the more I love it, so I feel like if I love what I'm doing and I feel challenged and just the positive energy from people that I meet every day. It just keeps me going you know.”

This participant talks about feeling a sense of freedom and a desire to only stop riding when she doesn't love it anymore, because it's so liberating and empowering to her. Turner (1987) notes that in mid-transition, the individuals are pushed as far toward structural invisibility and anonymity as possible. She (P2) added,

“It was like oh you know Mexico is full of narcos, Colombia is full of guerrillas, and these things I would read about. I don't know, part of me just knew that that wasn't the whole story. You know that there was really like a beautiful side to these places and I wanted to see it for myself and maybe like change the minds of the people in my life and I didn't want to be careless or foolish, but I just thought these that I hear that these places are so dangerous. Oh El Salvador is the murder capital of the world, and you know, I just thought like what if I went and none of these things were like firsthand experiences of people that I knew but I read about it on the internet, I read it in the newspaper. You know, I just thought I wanted to have my own experiences and you know see the other side of these places that usually are just well known for their crime.”

While this participant was mentally prepared for changing the plans in case she did not find the adventure worthwhile, she decided that it worth trying to see things for herself. For her, the act of understanding the host culture and adapting to it repeated every time she moved from one country or region to another. As she learned more about the hosting cultures and their languages, the easier it became for her to adapt and keep riding.

This “new found freedom” (Lifton, 1999) allows individuals to release themselves from the past that they wanted to leave behind and start constructing a new self. Freedom, as Cooley (1992) says, is the absence of constraint, which cannot exist in the sense of social limitations because “a man has no existence apart from a social order.” Cooley defines freedom as “ the light of the contrast between what a man is and what he might be” (p. 423).

Travel in pursuit of freedom required individuals to spend more time and effort in managing their interactions with others, and in some sense, what Gergen calls the sense of enslavement (p.

74). This sense of enslavement came from a desire to become a slave to the desirable. “To ‘want’ reduces one’s choice to ‘want not,’” which calls for more attention, more effort and inevitable sense of frustration (p. 74). P18, a young female in her mid 20’s from the fellowship group, said,

“I didn’t go halfway across the world to hang out with other Americans. And it was... I would rather spend a couple hours a day, you know like, at markets, or in cafés where the locals actually hang out, and try to get to know *them*. [...] I don’t- I don’t really see the purpose of going to South America to meet the same kind of people I meet at home, so.”

By way of compensation, the individuals acquired a special kind of freedom, a sacred power of the meek, weak, and humble (Turner, 1979). The feelings of gratitude and humbleness are more noticeable in parts of P2’s interview. P2 is a 38-year-old single female from the self-funded group who had traveled solo for over 2 years. She said:

“...I wonder like who I was before this [trip]. I never ever expected the world to be like this, like it’s really changed me, just to trust people and just to see the capacity for generosity like for whatever reason they just see me as their neighbor or like their family, you know. It’s very, very amazing. You know, I was living in New York and sometimes people would stop me and ask me for directions and sometimes I would only have a 20-minute lunch break and tourists would stop me and sometimes, I wouldn’t even look at them. I would just keep walking and act like I didn’t hear what they said because I didn’t have time. Oh my god, I think of these moments and it’s really like embarrassing to think and you know I think now I asked people for directions and they walked me there.”

This participant acknowledges how different she was prior to this trip and how she has changed (shape shifting) as a result of interacting with people abroad (adapting to context). This “combination of identification with one’s origins and movement away from them” is another characteristic of a protean self and Lifton (1999) says that this combination results from openness to self-process and sensitivity to the outside world, often painful personal exposures that could be transformed.

As these quotes illustrate, the shape shifting and transformation of self did not occur only through biking to novel places, but through engaging in new lives and experiences when she temporarily lived at each destination. For this participant, camping in locals’ backyards, staying at their houses, and living off the beaten track allowed her to immerse herself in those cultures.

Through becoming a temporary participant in a place, rather than an outsider, she was able to reconstruct her identity and feel challenged by it.

Adapting and acclimating to the host culture manifested in different ways. For example, P18, a young female in her mid 20's from the fellowship group, shared her experience in Indonesia,

“Medan, which was like, just the grossest city I’ve ever seen in my whole life. Like ah... sidewalks were... there used to be a sidewalk there, but it was mostly gone away, so there was just like a open pit sewer kind of thing. Rats, and garbage everywhere. [...] I was surprised that I ended up staying in Medan for a few weeks. [...] I would like to believe that I like a minimalist lifestyle. <laughs> I don’t actually like comfort. I feel like, with comfort, comes boredom, and comes depression. You know, in Indonesia, and in most other places I was in, with the exception of the Southern Cone, there’s like incredible poverty, and people have low life expectancies, and die of preventable diseases. But I never got the sense that people were unhappy there. And I wasn’t unhappy there. Every day was a new day; it felt... it’s like, you know, backpacking, when like... I can’t- I can’t- I can’t actually believe that I’m enjoying taking down and putting back up a tent. Yet, somehow, for some reason, I am. Like I *love* doing that. It seems so silly, but there’s this whole- this joy in like, a lack of consistency, and how great a tent over a crappy hotel room with rat feces in it is <laughs> after you’ve been wandering around in the hot sun all day, or whatever.”

For Lifton (1999), rapid adaptation is due to the “innate plasticity of human development and behavior” (p. 230). When humans find themselves in confusing situations, we automatically seek to adapt to them. Lifton states, “We modify the self to include connections virtually anywhere while clinging to a measure of coherence. The individual self thus learns to develop a place for many places” (p. 230). This adaptation provides context for what she (P18) said about a dramatic shift in her worldview:

“And the weird thing is, there are aspects of this trip that, I feel like, made me more inhumane. Where before, you know, I read about abject poverty in some of these places, and I was like, “That’s *awful*, I want to change that.” And after I was there for months, it was more like, “Well, that’s the way of the world...” And I don’t want to feel like that; I’m surprised that the real-life experience of it would actually make me less emotionally involved in it. But maybe it’s what you have to do to cope, when it’s just around.”

Lifton (1999) believes that this type of evolution helps us redefine “human nature not as a fixed set of structures or behaviors but as a mutable array of potentialities one can

always draw upon” (p. 231). For Lifton, “Proteanism is a means of coordinating one’s energies toward at least minimal integration and maximal reach,” (p. 231) which helped this participant reduce thoughts of herself as inhumane that could lead to confusions leading to depression and isolation from society. Although she experienced confusion and discomfort, her resilience and protean attitude led to a more inclusive sense of self.

Similar to the activities related to preparation, acclimating and adapting was not limited to travel destinations. Long haul solo travelers talked extensively about the difficulties of adjusting to the social structure of life back home when they returned. P18, a young female in her mid 20’s from the fellowship group, talked about her transition to adulthood after she returned from several months of intense travel:

“[Feeling more responsible and accountable] hit me when I got back. <laughs> [...] while I was traveling, I was so unaccountable for *anything* I did. That... terrifying, actually, I think. <laughs> I have to remember not to throw garbage out windows and stuff when I got back. Like, terrible. <laughs> And like, fruit. Like it- the rind of a fruit, or something. But still, like, yeah, all garbage went out the window in Indonesia, and- and first it- I was like, that’s awful, but then it was like... It’s going to end up in the same place, regardless, so. Yeah. It’s so much more accountable here now that I’m back. <laughs> And I actually try to- I try to force myself to use transit to get to work. And I already know I’m going to leave this neighborhood in eight months, because I can’t deal with the bus, <laughs> but still...”

P19, a young female in her 20’s, from the fellowship group, also found it challenging to fit in at home when she returned. She said,

“with other people, you know, they’ll say, ‘How’s being back?’ and I just tend to say, ‘Good.’ And it- it *is* good, I- I really like it, but it’s also a lot more complicated than that, I think. And I’m only starting to realize that. And so finally like, this other girl [a solo traveler who recently got back home] and I went out the other night, and I was like, ‘Man I just had like a weird day, like I- what am I doing, and... this is weird to be back...’ and I think finally my culture shock was starting to happen, three weeks after I got home. And I don’t know how much other people can relate to that, and I also don’t know how much they want to hear it, but with her, she’s going through it as well, so... That’s been really nice, yeah.”

As Lean (2014) notes, “the idea that one returns from corporeal travel is somewhat misleading.” This is because the perspective and context to which travelers return has also changed, even if it’s not perceivable. Travelers may have formed new relationships, undertaken new roles, developed new thoughts, and brought back new objects symbolic of their experiences, so they are not the same people as when they left home. Also, home is not a static entity and may have changed while the individual was gone. Friends and family might have transformed through their own physical, communicative, and virtual travels; they have also adapted to the individual’s absence, which can alter social practices and relationships. Major political, cultural, or social events may have similarly transpired.

Despite these changes, individuals can mostly be re-immersed into their old social relationships, roles, and performances. Society and technology play important roles in shaping a traveler’s sense of self upon return.

The act of foreign travel is regarded as a successful activity. Iso-Ahola (1983) notes, “it is natural for a traveler to expect others to view him in high esteem and status.” Self-esteem is positively related to personal successful experiences or behaviors. The more a person has traveled, the more others consider that person to be wise and experienced.

Many individuals like to share their personal travel experiences not only in order to compare them to those of others, but also because they want to increase one's social status and self-esteem, like Cooley (1992) describes in the looking glass self.

However, gaining experience and shifting perspectives can lead many travelers to see themselves as different from other people. They have stories to tell, but that is where many conversations end. Many conversation companions will not be able to share similar stories, or relate to them. This leads long-term travelers to find that settling back into their normal lives is difficult. P5, a 30-year old single female from the self-funded group who had traveled solo for over 5 years, and she said:

“I don’t know that I ever can get back to [normal life]. I never, now that I have traveled for so long, I prefer to stay in a single city like for all of a week or ten days before I move on so I don’t know what it looks like to sort of reintegrate and have friends in a community, but I still have the travel people who understand this need to continue to exploring, keep moving.”

She (P5) also talked about how her perspective has changed after some years of traveling:

“I’m so tired, and I’ve missed a lot of moments in my friends lives and I have actually planning a transition year right now where I’m not sure what I’m going to do next. My goal maybe four years ago, was to travel for five or six months and then to come home for a couple of months and then to travel for five or six months again. I think that I’m going to reverse that and travel for two months, come home for three months, later travel for two months again, but I want a year round home base somewhere where I can have a community but still have long term travel be a part of my life.”

The theme of uncertainty is apparent in both these quotes. Some travelers see endless future possibilities after they return and entertain various options, but have difficulty placing themselves into any of them. P5 added,

“I’m shopping for homes, my friends; the reason I’m here, I’ve been in Seattle for seven weeks. I accepted a house sit from a woman who runs a tour company, so she and her husband were trekking in Bhutan and they needed a house sitter for seven weeks and my friends were like you should make Seattle your home, please so come and so I’m sort of shopping for a home. I’m from Florida, and that’s where all my family is. I went to college in Florida, so I have a lot of high school and college friends there and then of course southern California is my home base, so I’m thinking about all of these but I don’t know.”

There is a desire to be close to friends and families and maintain a social life and be part of some communities, but several solo travelers in my study said they struggled with settling down after they returned. One participant ended her relationship with her long-time boyfriend, and two other solo travelers got divorced because married life and long-term travel did not go well together. For some travelers, travel never ends even after they return. They always find something that reminds them of their travel moments, sometimes in news, sometimes in ethnic foods, in meeting people from the countries they visited, pictures or videos online, or music, and objects they brought back with them. As one of the participants—who I interviewed in Seattle—told me, “Oh, I am not back yet. I am still in China.”

These solo long-term travelers experience tension in maintaining their sense of traveler self while engaged in an old performance (e.g., at home, at work, etc.). As Giddens (1991) states, “our identity is not to be found in our behavior, nor in the reactions of others, but in the capacity to keep a particular narrative going” (p. 54). Maintaining one’s narrative is done by continually integrating events in the outside world into our ongoing story about the self. However, Belk

(1988) says that in doing so, we “seem more content to collect cues for a series of self-related vignettes that we hope will somehow selectively cohere into an integrated sense of self. These little stories about the self may appear to reveal a postmodern fragmented self.” In other words, an abundance of digital data may lead to the creation of a postmodern, fragmented self. This is because these data allow for self-relevant information to be instantaneously accessed, refined, indeed, even fabricated” in self-presentation.

Identity theories did not capture participants’ diversity in terms of their levels of travel experience with regards to acclimatization activities. The more senior and experienced solo travelers were more confident when dealing with unfamiliar situations and spent less time adapting. They also spent less time on social media and internet than inexperienced solo travelers. However, they said that they spent less time on social media in general.

The more senior and experienced travelers were not accounted for, especially as it pertained to the theories of saturated self and the presentation of self, because these groups of solo travelers were not preoccupied with their self-presentations on social media.

For example, P8, an experienced male solo traveler in his late 50’s, expressed,

“I have to remember that I’ve learned so much, accomplished so much, and have so much confidence, I really put that to use when I decide that I’m going to take a hard look at myself. That’s when I’m confident, when I can look at myself and go, you know what, I screwed up, or I did this wrong, or I did that wrong, and admit to myself. I think that takes a lot of maturity to do that, and I think that’s what really – that kind of confidence is all about, and I can’t ever fool myself and tell myself – and be depressed about myself.”

He (P8) was confident with his abilities and skills to figure out how to navigate in an unknown or unfamiliar situation. He would not think of making mistakes or lack of knowledge in particular situations as issues that would impact his confidence.

### **3. Identity theories and exploration activities**

While travelers have unique journeys, they also share some common experiences. Humans travel as “conscious, social and sensual entities, physically placing ourselves” in other geographical locations (Lean, 2012). Relationships, conversations, social institutions, roles, routines, objects, and symbols that have come to construct (and maintain) a particular way of looking and acting

in the world (Berger & Luckmann, 1967) may all be modified through travel. In addition, travel has the capability to expose travelers to alternative realities, along with providing opportunities and stimulus for reflection on existing ideas and behaviors. In doing, it may transform a traveler's thinking and practices (Kottler, 1997).

In this section, I discuss activities related to exploring the area that do not require excess time, energy, and effort on navigating in a new environment. Exploration activities include hiking, sightseeing, observing, photography, and so on. Here, I discuss instances when participants engaged in authentic, local experiences once they felt comfortable in their new environments. The focus was on these authentic ways of exploring, as opposed to tourist explorations, that provide insight into how travelers overcome culture shock to enjoy their time learning about a new place. For example, P18, a young female in her mid 20's from the fellowship group, said,

“getting on a bus that I knew was supposed to cost 20,000 rupiah, and the guy at first, will be like, “100,000.” And I'll be like, “Nope.” <laughs> and keep walking away until he's finally like, “Okay, 20,000. [...] I was convinced if I kept walking around, I could drive the price down, which is like, almost always the case for any tourism service in any country. It's like, you go from one person to another and say, “They gave me this price but I like you more.” Whatever. And it was all *very* set here.”

The sense of accomplishment from rejecting locals' opportunistic behaviors in a foreign country where she stood out as a tourist was very rewarding. She (P18) said,

“I was basically stingy after a while, because I- I got so sick of being hassled all the time, that I would just get to the point where I'm like: I'm paying for lodging, and I'm paying for food, and when I need to go somewhere on a motorcycle, I'm going to negotiate loudly and ridiculously with the driver.”

Participants were not only proud, but they also felt liberated to fully immerse themselves into their new environment. P18 added,

“that sense of like, I can do anything I wanted there, provided that the locals liked me, and I had enough money to, um- to.. ah, what's the word? If the police wanted to come... bribe Yeah. Which the- the same amount of money was always 50,000 rupiah for anything you do that the police claim you've broken the law. And I felt *really* lucky that I was there for three months.”

This participant was happy that she could spend his time the way he desired despite the broken system in the Indonesia that could cost her money to stay away from trouble. She added,

“Like, to me, this is- there’s this endearing aspect of like, ah, you know... I fought with a woman on the street- on the street, who was trying to, basically, take my money for doing nothing, and all these things where it’s like, it’s crazy how different it is. For a lot of people, I think they just want to get somewhere, they want to check into a hotel, they want to go upstairs and take a nap, and then they want to come down to the hotel bar and drink with other foreigners. And in no way would Indonesia be a good place for someone like that to go.”

Recreational travel is a dialectical optimizing process in which two forces simultaneously influence the traveler: the desire to leave personal and interpersonal environment behind, and the desire to pursue or gain certain personal and/or interpersonal rewards. It is optimizing in the sense that the individual aims for an ideal level of connection with others, to shut oneself off at times and to open oneself up at others. (Iso-Ahola, 1983)

This dialectical process was present in participants’ interviews. For example, P19, a young female in her 20’s, from the fellowship group, said:

“... at school, mostly because of the environment it’s pretty high stress and people, like I don’t get super stressed out by school but being around other people who are stressed out, stresses me out. So that’s the time when I like to have time alone... I don’t really like going solo but I feel like I should and it will be like good for me because I really like back away into this comfort zone a lot but I like pushing the boundaries and pushing myself to like develop more, and I feel like a lot of the people in the world actually are more similar than you think and that we may have different lifestyles or you know cultures that we come from, like these parts of humanity kind of like have a single thread and so that’s kind of like what I want to, I want to just be with people living their normal lives, so that’s kind of what I want to, that’s what I’m looking forward to.”

She explicitly says that she is not very comfortable traveling solo (she had some prior solo travel experiences); however this participant still likes to travel alone because she likes to distance herself from stressful environments, develop herself (push factors), and meet new people (pull factor). She reached an optimal balance of shutting herself from her current stressful environment and opening herself up to meeting new people at other places. This need for physical distance offers space for self-redefinition as she moves through the physical and

cultures challenges of long-haul solo travel. In other parts of the interview, she talks about her shy and introverted personality that makes her “back away into her comfort zone,” and her desire to fight it. These comments are connected to nascent or emerging identities that she had experience through her prior limited and short-term solo trips. Now she is excited to put herself in environments that test her and construct a new sense of identity.

She also described a desire to be alone, while at the same time, she looks forward to meeting new people. According to White and White (2004), during travel, the need for distance and space usually comes with a need for social contact. In their study of long-haul travelers in underdeveloped areas of Australia, White & White found out that for most solo travelers, “periods of solitude and isolation were punctured by interactions at various communal overnight stops and tourism sites.” The researchers added that long-term travelers are engaged in a movement between social distance and social contact. White and White (2004) argue that solitary periods in rural settings “propel people into a search for social contact.” Also, in Iso-Ahola’s (1983) survey of wilderness travelers, 82% of the total sample rated solitude as an important feature of wilderness. However, only 2% of them traveled alone the entire trip. According to Iso-Ahola, the idea of solitude is a relative concept and is defined in terms of the individual’s own social company.

This movement between social contact and isolation, combined with the long-term traveling and, in many cases, being out in the wilderness enables travelers to be alone while in the company of others. This makes it possible to discard old identities, and through a heightened sense of place and connection to the landscape, it provides a new foundation for personal reintegration (White & White, 2004).

Social relationships and interactions with people that solo travelers meet along the way also balances contact and isolation. White and White (2004) highlight that travelers can choose to preserve their anonymity, maintain distance, or to engage socially when desired, without feeling that it is inappropriate to take part to continue travel solo after meeting other travelers who might share same path.

“ ... she was really intensely planning how we were going to rush through most of Central America and, another guy that we had met expressed interest in riding with us, and I wasn’t really interested in riding as a team of three ... so I said well

what do you think about riding with Phil from now on? I kind of said, well I would like to ride solo and take my time, and yeah, she was accepting of this.”

In this example, the participant had met another biker with whom she rode for about a week until they met another traveler. Even though they all were heading the same direction, she decided to part ways and ride solo. Many travelers rush through experiences to maximize their time and money, but this participant wanted to prolong her ride without the external constraints of the other travelers that would negatively impact her trip.

Later in the interview she said that she saw both of these bikers at different places at different times, and they shared a short ride together again. Travel offered her a great way to manage sociability, which is a relief from permanent residence. It also offers a great sense of freedom, which is critical prerequisite to making leisure travel enjoyable (Iso-Ahola, 1983). The balance between freedom and managed social distance seem to be an integral part of the solo travel experience. This is important considering that for these solo travelers, being on the road itself means freedom. So, the ability to choose how and when to socialize was an aspect they appreciated very much.

Another important component of P2's (a 38-year-old single female from the self-funded group who had traveled solo for over 2 years) solo travel experience was that biking allowed her to meet and interact with new people without being tied to those places, which allowed her to keep moving without being a passive observer, and to become part of communities without being anchored there. For her, it was important to maintain a balance between mobility and stasis. She would stay in one place as long as she felt challenged and changed, and she moved on to the next place when her desired state of immersion or integration in one place was complete. Her goal was not to arrive at a fixed destination, but rather to enjoy her trip as it unfolded. She enjoyed it so much that she extended her trip from one year to about two.

Gergen (2001) says that in the eighteenth century, travelers started to seek activities that would “move” them personally. Travelers now care more about taking a walk that doesn't necessarily land them anywhere specific. Gergen says, “Seeing became a confirmation of the self rather than a process by which the outer world of nature was understood” (p. 11). This new conception of the individual self is noticeable in all aspects of Western life.

Interactions with other travelers may range in degrees of intensity, intimacy, and importance. Interactions could be brief and trivial or may overtake several days or even weeks. Several factors impact one's interactions with others; for example, if travelers have stimulating conversations, they may socialize for longer, as opposed to when there is a language barrier. Some experienced travelers did not enjoy trivial conversations. P5, a 30-year old single female from the self-funded group who had traveled solo for over 5 years, talked about her selectiveness in social interactions with others.

“...in the beginning I was really jazzed to meet a lot of people and join a lot of groups, and then after several years of the same sort of conversations like every conversation at a hostel starts the same way, how long have you been on the road? You know et cetera, et cetera. I started being a little bit more selective, but that being said, I do look forward to [meeting people] and if I get lonely and if I find myself being too introverted. I sort of make myself go to the common areas; that's why I stay at hostels because otherwise it's much harder to meet people as a solo traveler if you're at a hotel.”

For her, meeting and interacting with other travelers is still valuable and she does not enjoy feeling lonely, but she has become more selective about the people she interacts with.

Technology also plays a role in exploration interactions. According to TripAdvisor's online survey of more than 50,000 TripAdvisor users who plan their trips online, 90% of Americans use their mobile phones while traveling domestically and abroad (91% for international travelers). Of which, 50% use them to post on social media, especially uploading self-portraits. Also, 28% checked into a restaurant, hotel or attraction using their mobile device while on a trip. These reports do not include the use of internet on laptops or at internet cafes.

Information and communication technologies (ICT) have the capability to facilitate more meaningful interactions between travelers and their destinations, which enhances the travel experience. Use of context-aware technology, combined with social network platforms on mobile devices, creates new encounters between travelers and attractions. Making destinations more social allows travelers to stay connected, well-informed, and fully equipped. Smart phones and personal technologies used during travel change travelers' experiences, enhancing some aspects while diminishing others.

Technology can be used for exploration in many ways, but (a) communicating, and (b) sharing were the two top uses.

### **a. Technology for communication**

Travelers use various communication tools to stay in touch with others. The level of connection is different depending on travelers' access to the internet at different locations and their desire to stay connected. Now that most smartphones have built-in cameras, many travelers video chat with people back home. All solo travelers in my study said that they would frequently call their family members while traveling. In cases where family members did not have an online account for video/voice chat, these travelers even planned to setup an account for them.

“I want to stay in touch with my friends and boyfriend and my grandma’s not in super good health and so I want to be able to check on her.... I imagine I will try to do like a Google Talk thing or something to be able to talk to [my grandma]. I think I can sucker one of my family members into teaching her something because she can barely use a normal telephone.”

This shows how technology helps travelers feel connected. In some cases, travelers continue to complete work commitments and even maintain their imagined presence at work. In other words, changing one’s geographical location does not alter former roles as friends, parents, co-workers, etc. This might be liberating for some travelers because it provides peace of mind by keeping them in touch with their close communities. However, this constant connection may prevent travelers from truly immersing themselves in their journey. Thus, some decided to make a conscious effort to limit their use of technology. For example, P14, a 27-year-old male PhD student from the fellowship group, said:

“I was dating someone from the States and, when I first left I really wanted to be in contact with her. And, I was kind of insecure inside, I was going back to like emails and Skype a lot, every day, a few hours a day sit in my hostel a lot of time on the internet. And that lasted maybe 2-3 weeks. Um, and then I realized it was detracting from my actual experience so I started like, you know filtering it off, using internet less, and doing more day adventures. Be gone the whole day, you know I would come home to hostel and use internet for 30-60 minutes but spend more time meeting people in the hostel. Then, in India, when I first got to India there was no internet, there was no power and you would go back n forth with power, no Wi-Fi so I kinda got used that to, you know, cut my relationship.”

For him, using the internet and connecting with his girlfriend was a way to deal with his insecurities. Throughout his interview, it became apparent that this sense of insecurity was

stronger at the beginning of his long-haul trip and also in places that were dramatically different from the U.S. For him (P14), cultural and contextual changes demand a new orientation toward self to somehow revisit his traditional views of “self as an object” and replace it with “sense as a process” (Gergen, 2001, p. 154).

According to Iso-Ahola (1983), people suffer both psychologically and physiologically from under-stimulating and over-stimulating environments. When the social environment provides too many inputs and stimuli for an individual to handle (i.e., the situation is too incongruous in relation to the stored information), that individual tends to withdraw from the environment. On the other hand, when the environmental inputs are overly similar to the coded and stored information and experience, the individual becomes bored and seeks situations that offer more incongruity, uncertainty, novelty, and complexity.

Several travel studies talk about the travelers’ need for both stability (psychological security) and change (novelty) in their leisure experiences and behaviors. Perhaps, for this participant, using the internet and social media to connect with his girlfriend was a way to deal with an overwhelmingly unfamiliar structure of the new places he visited. However, as he (P14) talked more about his experience, it became apparent that he had worked his way through his insecurities and was able to focus more on his travel experience. For example, he said,

“... at first I journaled like mostly about the emotions I was feeling about the girl I was dating and after that it transitioned to the travel experiences themselves.”

#### **b. Technology for sharing**

Many independent travelers document their experiences through online platforms like Blogger. Blogs allow public access to personal thoughts and personal space as a way to make one’s life significant through feedback and support from others. People who visit a blog, like a post, and leave feedback help bloggers construct their sense of self through Cooley’s (1992) looking glass. According to Sorapure’s (2003) observation, “in an online diary, pieces of information about the self may be brought together in different configurations, signifying multiple and shifting ways of understanding the self.” Through sharing, travelers get to present themselves, get to know other people, and get to interact with others via comments.

These blog posts often include at least one photo, if not more. Even though sharing and photography are not new to travel, digital devices help travelers share more, and to more people. For example, as Mendelson and Papacharissi (2007) noted, in older family albums, the photographer was not often represented in the album, whereas with selfies, they can be included. With the growth in self-portraits, there has been a shift from family photos to individual galleries and we have entered an unprecedented era of self-portraiture (Belk, 2013).

Belk adds that the self-portraits “together with blogs and web pages, has arguably led to greater self-reflection as well as more digital bits of the extended self to represent us, sometimes with multiple daily updates.” Many sources use the acronym FOMO (fear of missing out) for those who share extensively online (e.g., Grohol 2011; Wortham, 2011).

These blogs act as travelers’ autobiographical memory, which Bluck (2003) suggests serves three functions:

- Self: Autobiographical knowledge aids self-formation and preservation by providing a sense of continuity over time.
- Social: It helps us bond with others through sharing stories, fosters empathy with others, and makes conversations seem more truthful and believable.
- Directive: It helps us learn from the past and guides our future behavior. Personal stories are particularly significant to selfhood, as the second subsection below discusses.

Several of participants in my research also indicated that they actively use social media when they travel, for example:

“I upload [my photos] onto the Wordpress app and then usually I will write a little summary about places I visited and put a few photos and then write a few more summaries about the route that I took and then it’s usually like camping specific photos or photos of the road or food. I will put the most gorgeous scenery out on Facebook and I will get a few likes, but then I will put a photo of something I ate, I get like a hundred likes.”

This participant said that she eventually decided to take more photos of the food she ate to post on Facebook to get more “likes” and left the rest of the photos for her blog. This ties neatly to Goffman’s (1958) view of “impression management” as a tool to “prevent outsiders from coming into a performance that is not addressed to them.” In a sense, this participant is managing her identity online in relation to the audience of each social media platform. This is a

demonstration of what O'Regen (2009) noted as "the number and feedback of viewers provides self-validation for the writer."

Facebook is now a key part of self-presentation for millions of people and provides an environment for users to manage their identities. Facebook and blogs aid a sense of past and provide a more complete self narrative with an idealized view of how we would like to remember ourselves (Belk, 2013). This may explain why friends share positive posts and appear always happy. The virtual environment allows everyone to re-world (Kozinets & Kedzior, 2009) their lives and to remodel their identities. The previous interviewee reserved her breathtaking landscape photos for her blog's more adventurous and appreciative visitors, who would often leave comments on the posts. In this sense, technology allowed her to share these travel moments with others.

P7, a young single female in her 20's from the self-funded group who had traveled solo for over 4 years, was cautious about which Facebook friends see her photos. She said,

"Someone who doesn't know me very well, I'd rather just have them see the good ones [referring to photos] on Facebook. The ones that aren't as good, they require a bit of a story, but I should probably be there to tell, so."

That results in having multiple digital selves and presentations online that may or may not represent one's "real" identity in physical world. Several psychological experiments show that these differences between individuals' virtual and offline lives can impact their behavior, such that people change after spending time creating their online presentations. Some studies show that positive online presentations can increase confidence, which translates into the physical world (Belk, 2013). This links to Mazlish's (1995) fourth discontinuity, which says technology is not just a tool, but we shape technology, and technology shapes us. This recursive relationship between technology and humans overtime has led to a coevolution. Mazlish (1995) argues that human nature is not fixed, but is rather an evolving identity, secured in the process of adaptation to "nature." This makes it difficult to talk about human nature without considering technology, particularly in Western civilizations.

Changes in travelers' identities and sense of self that resulted from sharing and posting online have also been termed a Proteus effect, after the ancient Greek god who could take on whatever form he wished (Lifton, 1999). In other words, the virtual world allows people to discover who they are by letting them be who they want to be (Belk, 2013).

Taking selfies was another activity that solo travelers mentioned. Posting selfies to social media accounts ties into Goffman's presentation of the self as solo travelers. When traveling solo, participants are disadvantaged by not having a companion with whom to take photos at landmark places. P13, a 38-year-old single male from the fellowship group, said,

“I did lots and lots of selfies. Because I was traveling alone, that's the one thing that, when you think about the things are difficult solo traveling, small things like that. You are standing at an awesome monument, and you want to get a cool shot of yourself, but you end up taking a cheesy selfie, at a bad angle where they can see up your nose, it is things like that. So that is why I took my sock monkey, so instead of taking selfies I just took pictures of my sock monkey. So that way I could convince people I was there I brought my sock monkey to the Wailing wall, I brought sock monkey to the Mona Lisa...”

For him (P13), it was important to be able to show to his friends that he had actually visited certain places, yet he didn't feel comfortable sharing a “cheesy selfie” with the world. So while planning his trip, he decided that he'd take his “sock monkey” to present at these destinations instead. The sock monkey added a playfulness element to his photos that P13 enjoyed. For P13, the sock monkey served as his travel companion. He said,

“I took my sock monkey with me. My soft stuffed monkey that is made out of socks that I would use as my travel partner, so I would go and take pictures of him. I would shove my way through the Louvre and shove him past all the Asian tourists to see the Mona Lisa and took my sock monkey and the “Click”...”

Finally, the way travelers share photos has changed with the proliferation of new photo-editing tools. As Belk (2013) notes, we have gone from taking photos to making photos. Digitally edited presentations of selves sometimes look very different than our physical selves. A quick search on Google returns several edited images (sometimes very poorly) of individuals cropped into places they've never visited. Such fabrications illustrate many people's desire for travel, even when they cannot do it. A ubiquitous cultural desire to travel makes real travelers feel special and successful because they were able to visit places others can only dream of.

Solo travelers use technology to connect to other travelers or locals. Social networking websites, travel forums, and meet-ups have opened new possibilities for solo travelers to interact with others on the road. This is similar to the studies of backpackers (Anderskov, 2002), drifters (Cohen, 1973), and budget travelers (Riley & Love, 2000), who exchange information by word-

of-mouth, and now, or electronic word-of-mouth (Litvin, et al., 2008). These travelers can connect quickly with others to discuss the best places to meet, to hang out, visit, or eat. Usually, newcomers or less experienced travelers seek information from seasoned or experienced travelers.

Interviewees used the internet to connect with others prior, during, and after travel. For example, P7, a young single female in her 20's from the self-funded group who had traveled solo for over 4 years, said:

“I made a random connection. Now I can't remember where I met this guy... I met somebody within a week or two before I left, who had been in- traveling in Southeast Asia. And then we stayed in communication via email; that was really interesting. And there was a couple people who had previously traveled in South America, who I emailed a little at the beginning.”

This participant decided to use the internet to connect with other travelers who have been to the countries she was interested in visiting. These communications helped her gather useful information and answer her questions about these places. She reported that having access to travelers via social media, reading their blogs, and browsing their photos also helped. Learning about a new place through other travelers is different than learning through internet searches in the sense that she could find someone who had the exact experience she was looking for as opposed to general travel blogs or guides that may not provide the level of specificity she was after.

Using online platforms to meet other travelers, and later stay in touch with them, allowed for brief and spontaneous friendships. Sometimes, these also developed into more intentional, long-term, and ongoing relationships – if desired. For example, P18, a young female in her mid 20's from the fellowship group, said,

“I friended this French guy I met in Lima and when I was in, umm, I did not like India at first, because, umm, I hated it. It was just ... it was just too much. so I saw his pictures [on Facebook]... and there was this picture of this holly, I guess, river I wanted to visit and yeah, so I thought he must be in this part of the world. I looked further and yeah, he was in Varanasi where the river is. I messaged him that hey I'd like to join, and we met at this hostel ... we met some other people at the hostel, and we traveled for a few weeks in India together.”

In this quote, online communication tools and solo travel offered this participant a sense of cohesion and community. He met the French traveler in another country accidentally over a brief hiking experience, and they connected on Facebook. This brief experience resulted in an intense short-term friendship, which reconnected them in India, enriching and prolonging the travel experience. Earlier in the interview this participant mentioned that he was about to leave India, but reconnecting with this French traveler and meeting others in a hostel changed his itinerary.

Solo travelers tend to enjoy building intense, yet short, friendships with other travelers. This kind of intensive communication network is characteristic of backpackers (Noy 2006), while solo travelers would make a point to leave the group and go off on their own.

also use online tools such as Couchsurfing and AirBnB to help connect with other travelers as well as locals more intimately. Some of them use these tools in their hometowns to meet other travelers and keep in touch with them via internet and social media. For example P18, a young female in her mid 20's from the fellowship group, said:

“... other female travelers [suggested] that a really fantastic way to see some of these countries is to use Couchsurfing. And um... and she- she said, though, like, it's best to build up a profile before you leave, 'cause some people are not- they're not going to want to accept people with no references. So I was hosting people for the summer before I left, and one of the people I hosted had spent time in Peru and Honduras. And... so he was a resource for me when I was coming into that region.”

This participant (P18) seems to enjoy building long-term friendships with other travelers. Like the earlier examples, she has used technology to meet new travelers and stay in touch with them because she would like to reconnect with them in places around the world.

Identity theories did not capture participants' diversity in terms of their levels of travel experience with regards to exploration activities. The more senior and experienced travelers were not accounted for, especially as it pertained to the theories of saturated self and the presentation of self, because these groups of solo travelers were not preoccupied with their self-presentations on social media.

For example, P11, a 64-year-old divorced male from the self-funded group talked about his desire to be in the moment and immerse in the experience rather than learning about himself and reconstructing his identity. P11's remarks were similar to P8's, another experienced male

solo traveler in his late 50's. He expressed,

“I have to remember that I've learned so much, accomplished so much, and have so much confidence, I really put that to use when I decide that I'm going to take a hard look at myself. That's when I'm confident, when I can look at myself and go, you know what, I screwed up, or I did this wrong, or I did that wrong, and admit to myself. I think that takes a lot of maturity to do that, and I think that's what really – that kind of confidence is all about, and I can't ever fool myself and tell myself – and be depressed about myself.”

#### **4. Identity theories and reflection activities**

Reflection can be defined in various ways, but this research employs Dewey (1997) and Moon (2004) definitions of reflection and reflective techniques. Dewey views reflection as “turning a topic in various aspects and in various lights so that nothing significant about it shall be overlooked” (p. 52, 2013). And Moon similarly defines reflection as “a form of mental processing with a purpose and or anticipated outcome that is applied to relatively complicated or unstructured ideas for which there is not an obvious solution” (p. 98, 2004).

Solo travelers in this study consciously and intentionally reflected on their travel throughout their trips and after they returned. As mentioned in Chapter 4, reflective thinking happened more when travelers returned home and when they were disconnected from the internet, either by choice or a lack of access.

P5, a 30-year old single female from the self-funded group who had traveled solo for over 5 years, reflected on her social media use and extensive blogging throughout her travel and her decision to stop. She said,

“Stopping blogging helps....I didn't really update my social media account or blog or do all of that but...for me the sharing of my journey shifts, it came from this really [inaudible] place like I wanted to share, I was really excited about the trip I was going on in 2008, my parents were reading it...I was blogging just because I was so excited for everything that I was doing and then...travel blogging exploded...and it was like why are you blogging? Are you trying to make money? And I kept thinking about preparing myself and trying to come up with better experiences that were going to translate better for the blog, well I should do this because it will get really good pictures I can share with my followers and I was like who am I and what does that even mean, so reflecting allowed me to

just go, I'm here in these cultures to learn about them and for me to learn about myself and separating from the blog helps me keep a distance from that world that is kind of make believe I guess a lot of people talking about themselves and the idea of you know how Facebook is the presentation of our best selves.”

This participant cared about the way she presented herself to the world through her social media account. At some point in her travel, she decided to stop blogging because she reflected on the image she presented of herself and also what she hoped to get from blogging and Facebook.

P18, a young female in her mid 20's from the fellowship group, also reflected on her trip after she returned home. She described how her travels had made her feel like an adult for the first time in her life and the types of things she'd like to do in the future. She (P18) said,

“I think this is the first time I really feel like I'm an adult. That all my obligations are basically to me, which is really scary. And I get to make these decisions that... I make all the decisions about me, and I don't have to worry about a school, or anybody else right now, and... It's weird. I mean like, I have- I'm going to go to Portland next weekend with a pair of friends who- they just posted a thing to Facebook that said it's their 10 year anniversary. And I knew they were like- I think they're both in their early 30s, but still, it's like, they're amazing to me. And of course, I would like to have something like this eventually. I don't feel like I need to rush it. But it is kind of weird. I feel like I'm transitioning academically, where like I've left formal school program for the first time. I'm transitioning in terms of a career. Like, I got into the field I wanted to get into so badly, and I just have to prove myself. But I'm definitely transitioning in terms of like, you know, who am I going to surround myself? What kind of relationship do want to be in? You know, *if* I want to be, and all this. So, it's a lot of things, but... It's scary. I'm just trying to be very honest with myself about it, because I feel like putting everything behind the veil of “I'm in school” has been a- it's been a way for me to like, not really understand myself for a long time, so.”

P19, a young female in her 20's, from the fellowship group, reflected on her observations during the travel and said,

“And at first, I was so shocked. And then I started really seeing like, plenty of people do insane stuff all the time. Like, I met these people who biked from Cairo to Capetown. I'm like, that sounds really hard. <laughs> And it- I don't know, it made me realize how possible everything is. People just kind of shut their mind off to what they *can* do. And yeah, maybe it's like, a little more dangerous or something, but that's now the track I'm on, is like... I really want to

keep traveling, and start doing things. I like the challenge of it, I like... Like I don't think I would like going on a tour. Well, I'd probably like it, but I wouldn't like it as much as the challenge of like, doing something on your own, and figuring out how to get place."

P18, a young female in her mid 20's from the fellowship group, expressed reflective ideas at the very beginning of her travel about how she was going to present herself to the world. She said,

"So it was pretty early on that I decided, I just like, you know... I'm a tourist. I'm gonna embrace it. I'm gonna try to be a good, responsible tourist. But, to the- to- <laughs> to say that I was fitting in, or getting to know people, or learning these like, deep things, about a place, would be a lie. And so I'd just say that I'm like, you know, I stood out; I was uncomfortable."

She (P18) experienced reflective thoughts while exploring and meeting new people continued after she returned. She said,

"This is something that I became more and more a little depressed about, the longer I traveled. [...] like, sort of the dichotomy of the way people present themselves that like... There were people who I had a short conversation with, and immediately they were like, 'Oh, let me add you on Facebook.' And then, now they're on my Facebook feed, and it's just them trumpeting like, <sarcastic, mocking tone> 'Ooh, we're carrying on with an indigenous woman with a banana on her head.' It's just like, all this *stupid* crap. And I wish that I like- I should just delete them, because they annoy me. And then I think about the people who were *fantastic*, who I had just *great* conversations with, who I might have gone on like, two or three hikes with, over the course of a week in a hostel, and I don't have their information. And I'm just like... <sighs> I- I guess it's frustrating for me, just because I see the flipside of that so profoundly now, that like, I have people's information, who are just trumpeting terrible information about themselves to me all the time, and I *don't* want to know them. And I *wish* I knew those people who... who... They're not the kind of people who would just meet someone, and within five minutes be like, 'I'm your Facebook friend now.' So... it's frustrating. I tried to get better about it, as the trip went on. And this was like, actually, the huge tragedy of my trip, is that I was stuck on an island in Indonesia with a French tourist who like, I just hit it off with, from the second we start like... From the second we saw each other, I was like, "This guy, he's traveling the way I'm traveling," and I *never* find people like that."

It is important to note that not all travelers return home, but instead decide to stay nomad as long as possible. And, depending on the duration of travel, the context to which travelers return

have altered while they were gone –even slightly. I encountered both types of travelers; those had plans to return or had returned already and those who had no plans on returning.

For example, when P2, a 38-year-old single female from the self-funded group who had traveled solo for over 2 years, left home, she thought she would be back in a few months, but as she traveled, she decided that she did not want to return. She said,

“I tell people all the time – they say, when are you going back to the states, and I just tell them ‘never.’ It’s better here. People love me and they hug me. I could always teach English if I find a place that I really like, and I want to stay, and so. I enjoyed the times that I lived in San Francisco, and Seattle, and Portland, New York, all these places, but I feel like it was so hard to find time to spend with people, and you, even to see my family. And it’s like, we have to schedule a time, and it’s, I can’t just swing by my mom’s house, usually because she’s not home, or everything is just, no one has time for anything. and then people, a lot of people in my life talk about how stressed out they are, and how they don’t have time for anything, and this is just not something that I want in my life any more. And I just find that it sort of like, goes away when I, when I leave the states.”

This shows that some travelers’ quests seem to be less motivated by the eventual return and increased social status (unlike what Turner argues in *Liminality*), and more motivated by the willingness to unbelong or become unbound from their culture. For these travelers, travel becomes an end point instead of a transition.

In addition, the returnees in this research talked extensively about their desire to travel more. I interviewed P1, a single 23-years-old female college student from the self-funded group, about three weeks after returning from Southeast Asia, and she said,

“I already started planning [my next trip]. South America. I would like to spend a longer period of time there. That is the one thing that I would change. Last time I had to be home July 9th, because I had orientation for school and stuff. If I did not have that I would be gone much longer. I’d like to spend more than seven weeks, at least three months traveling and taking my time. I guess I just felt like the last one was a little too, it was just barely too fast.”

Participants who returned said that the reason they are back home is to see their families, work, and save some money to get back on the road. These travelers treat their hometowns as temporary places and the “road” is where they feel they belong. Both less experienced travelers as well as more experienced travelers expressed this sentiment. However, one experienced

traveler who had gone through intense extended trips for over four years told me that she would like to make some changes and spend more time in the country. P5, a 30-year old single female from the self-funded group who had traveled solo for over 5 years, said,

“I think that I’m going to reverse that and travel for two months, come home for three months, later travel for two months again but I want a year round home base somewhere where I can have a community but still have long term travel be a part of my life, but that may not be in the U.S.”

She still likes to travel long term, but with a longer break in between the trips. In addition, she is determined not to make the U.S. her home base, and she told me about trying to find a residency in another country that would allow her to stay long term and work in between trips.

For these travelers, if and when they return home, they do not feel a long-term obligation to others or a clearly structured way of interacting with others. Some of these travelers pursued new ways of earning money that do not require them to be bounded to a physical place. For example, some now write travel articles for some media or do travel photography. In other words, they have changed their career paths to gain the freedom they need to keep traveling. This adaptation to context and fluidity is very close to Lifton’s notion of the protean self, especially as he talks about how people manage to take up new attitudes and endeavors in response to changes in their lives. These are the features of postmodernism that Gergen notes “we are invited to expand outward, to incorporate the possibilities inherent in other culture forms, borrowing and integrating intelligibilities from other cultures” (p. 248)

Storytelling was another way for solo travelers to reflect on their travel while sharing their experiences with others. Storytelling plays an important role in identity construction (Giddens, 1991), and current technology takes storytelling to a new level, especially for (solo) travelers. The participants in my study also discussed how they tell stories using technology.

P2, a 38-year-old single female from the self-funded group who had traveled solo for over 2 years, talked about sharing her story with others in person on over social media. She said,

“I met a guy from Mexico and I was telling him about all the places that I went to in Mexico because it was so exciting and someone who knew about this really remote places, and I was showing him photos and I was like ‘oh wow it seems like another lifetime ago like it just seems so long ago.’ It really wasn’t but I was getting like very nostalgic, like I was thinking about riding to the ocean and camping on the beach and you know eating all these tropical fruits in the

Mexican markets and tacos and for a moment I was like, I would just love to ride Mexico all over again.”

She used her smartphone to show me photos from Mexico, and as she perused her digital gallery, she shared stories of Mexico and the guy she met there. For her, re-living those moments with someone who knows about some of those places is very enjoyable.

P5, a 30-year old single female from the self-funded group who had traveled solo for over 5 years, used her stories to inspire other women. She said,

“you know rather than telling people what to do, I think that the power of movies, I think as an actress you know, I loved movies, I loved getting transported into a story and I think that it’s the easiest way for someone to, when you take someone on an emotional journey, and not just tell them this is what I did, but allow them to insert themselves however they might want to into the people, cultures, smells all that sort of thing. But it has a deeper resonance even if they don’t; they get that initial high from the ways to change your life, and they share it and they tweet it and they Facebook and maybe it’s not as actual but the story I think that the way our brains are programmed lies deeper within us and that sets the stage for change because we tell ourselves stories about what we can and can’t do. And so when we read about other people and other places, those stories are able to be lodged in a deeper place than I think in our consciousness. And then this affects us because my ultimate goal is to get all Americans out of the door and not just to Canada, somewhere.”

Sharing her travel experiences through blogs or social media served as a catalyst for reflection and a process through which new meanings can be constructed with others. Through comments on her blog, some of which are from people that she met on the road, her individual memory combines with collective memory, and they complement each other. This helps the traveler achieve a more complete sense of self by recreating those moments with others.

P2, a 38-year-old single female from the self-funded group who had traveled solo for over 2 years, had no plans to return home in the foreseeable future. She took as long as she desired to visit each destination. For her, reflection was present at all times while exploring. She (P2) said,

“Um, I think mainly sometimes I really fixate on a – like, am I turning into a huge weirdo, like, am I [laughs] – am I so used to being alone and just being in my own head and meeting people for a few days, and then never see again in my entire life? And is that going to make me weird? I feel – I think I feel that more intensely than homesickness. [...] I miss people in the way that I thought I would

miss them. I think that's mainly because people are so supportive and so encouraging, and they really want me to keep going, and it really, really helps me. [...] like when I stop and meet people, they become my whole world for two or three days. They show me around, and I meet their family, and we spend all this time together, and then I just leave, and then it's like, oh I'd really – sometimes really, really miss them. [...] Like I feel sad because these people are just – they're so excited by – by everything. It just keeps me really positive.”

She (P2) reflects on her identity and her relationship with people who she meets along the way. After over a year of traveling, she is not used to the fact that the intense emotions and the relationships are not going to last longer than a few days and she might never see those people ever again. Gergen discusses how these intense, temporary relationships that are constantly disrupted as defining features of postmodernism. He adds that individuals reach to a point to learn that they cannot do much about it except to “keep it light and cool” (p. 66).

Identity theories provided insights about solo travelers, but they did not capture participants' diversity in terms of their levels of travel experience with regards to reflection activities. The more senior and experienced travelers were not accounted for, especially as it pertained to the theories of saturated self and the presentation of self, because these groups of solo travelers were not preoccupied with their self-presentations on social media.

P8, who was a very experienced male solo traveler in his late 50's described himself as an introspective person and said “although I can always be better,” he is confident about who he is and does not think too much about reconstructing his identity. Similar to P8, P11 (a 64-year-old divorced male solo traveler from the self-funded group) was focused on enjoying the moment and “not looking for answers or solutions.”

In addition, P4, a 47-year-old divorced female, did not appreciate the reflective thinking and did not want to engage in conversations regarding reflection. She said,

“I have probably three terabyte worth of photos. I'm not on Instagram. Looking back at photos for me; it's just not something that motivates me. I would rather be out there doing something, I just don't feel compelled often to do it. Browsing and reflecting on my ... just doesn't compel me.”

For her (P4), being in the moment and savoring the sense of freedom as well as the joy of taking pictures were more meaningful than reflecting on them at a later point or browsing the photos.

She talked about her photography skills and that she teaches photography from time to time. However, she was not motivated and had no reasons to create an Instagram account and spend her time uploading her photos and managing her accounts. She did not care about other people “linking” her photos because she was confident in her photography skills.

### **Discussion - solo travel through identity theories**

In design project 2, I analyzed the interview data in light of three identity theories: (1) Protean self, (2) Saturated self, and (3) The presentation of self. Each of these theories focused on different aspects of one’s identity.

Protean self is focused on continually inventing and reinventing ourselves in a fragmented world. Hardships and changes in life make some individuals more malleable and encourage them seek alternative ways to make unfavorable situations more bearable and meaningful.

Saturated self is focused on how the development of communication technologies in the twentieth century has contributed to unprecedented rapid changes in social life and relationships. Exposure to new ideas has introduced different ways of being (relationships, opinions, values, etc.), new social standards and obligations (responding to emails, text messages, etc.) as well as new opportunities and realities. Continuous exposure to pluralism and various cultures is what Gergen calls a “multiphrenic” condition that can lead to conscious construction of the self, in which individuals talk more about the roles they play than a coherent core self.

The presentation of self focuses on how individuals present themselves in everyday life. Goffman used theatrical language to explain how we present ourselves based on what the audience wants. We can manipulate the stage (office, house, etc.), manipulating our appearance (clothing, hair style), and even our mannerisms (body language). Through these performances, we attempt to create and maintain an idealized self.

Solo travelers experienced these aspects of self and identity before they embarked on their travel, throughout the travel, and after they returned (if they did). Searching for one’s self through travel and the attempts to construct the self while exploring new social and cultural contexts were salient in the interview data.

Furthermore, I touched on a few roles that society and technology play in constructing individual’s self and how these tools may change individual’s relationship with others. This revealed how carrying digital devices could trigger reflections on self, identity, and how these

solo travelers see themselves in the world. In Chapter 4, I discussed how solo travelers paid special attention to what technology to buy, how and where to buy it, and how to care for it. Participants paid more attention to these digital devices than other items, such as clothing and souvenirs. Some participants used tools to lock their digital devices, not because they were expensive but because they contained precious memories. When these devices were lost or damaged, participants felt profound pain. P13, a 38-year-old single male from the fellowship group, said,

“Losing those photos breaks my heart. It actually makes me really sad to think about it because I lost, I lost half my photos in Jordan. So I lost everything from Petra! I got some beautiful shots of the Canyons in Petra. I went to Palestine and I took pictures of Bethlehem. I got some magnificent shots of the graffiti on the Occupation Wall. I talk about one piece of graffiti; it is the thing that I talk about the most from my trip, the writing said: ‘Now that you have seen you are responsible.’ And it was the most important thing that I saw on my entire trip. Because to be in a place for my entire life where we are told these are bad people, we should be afraid of them and protect ourselves from them, and to walk along this wall to see the stories of children blown to pieces, of mothers who have been raped, of the men who have been slaughtered in front of their families just because their home was on land that somebody else wanted, and then to read that and to know that my country has been complicit in a lot of this and have to carry this burden. It was one of the most profound experiences of my life. And I do not have a picture of it anymore because it was stolen from me.”

As discussed above, some solo travelers decided to prolong their trips to become “lifestyle travelers” (Cohen, 2010). This may be what Gergen claim about the changes in the postmodern period where Western discourse for understanding self and others experiences a major transformation as a result exposure to other cultures and perspectives. Technology facilitates this exposure and, in a sense, provides a way for minds to travel to different places. However, physical travel engages all sensory inputs and no other human activity has greater potential to alter individuals’ perceptions or the way they chose their lives.

Studies show that solo or long-term travelers underlying motivation is the desire to find their place in the world. In other words, travel is an investment to shape identity. As Giddens (1991) says, social hierarchies and traditional authorities no longer rigidly structure self-identities. Travel provides a way to experiment with a diversity of possible selves by adapting to different roles and performances. Thus, travel serves as a great way for individuals to decide among the

possible selves they try during or even after their travel. Because travelers construct multiple identities as they travel, it is difficult to say whether there would be a stop point for these travelers or whether they would ever settle. Giddens (1991) calls this process a self-actualization, otherwise known as what it means to live a full life.

Another reason travelers continue to roam is because they may face challenges in their hometowns as a result of changes in their identities. Travelers start to see themselves different from most people around them, Participants in my study recounted numerous occasions when people in their hometowns wanted to hear their travel stories but sharing them was a one-sided experience because others were unable to relate or otherwise contribute to the discussion. Desforges (2000) and Elsrud (2001) document similar findings.

Travelers also talked about the impact of long travels on their relationships because this kind of travel is associated with independence, authority, and self-sufficiency. Having a relationship in a traditional sense does not appeal to these travelers, and several talked about breaking up with their partners in order to be able to continue traveling.

Thomassen (2016) discusses that Turner acknowledges that liminal rituals are rare and diminished in industrial societies, suggesting “that liminal experiences in modern consumerist societies to a large extent have been replaced by liminoid moments where creativity and uncertainty unfold in art and leisure activities” (p. 185). Liminoid experiences are optional and do not involve a resolution of a personal crisis or a change of status. The liminoid is a “break from normality, a playful as-if experience, but it loses the key feature of liminality,” (p. 186) which is transition. When people gain the capacity to conceive of things differently or invites changes, they have a transformative potential.

From Gergen’s (2001) perspective, postmodern travelers have realized that their being and their actions do not mean much until coordinated with others and, without others there is no “I.” Gergen emphasizes the importance of relationships in postmodern times and writes, “Individuals are elements within relationships, they can neither stand apart from the social world or can be pushed and pulled by it, any more than the movements of a wave can be separated from or determined by the ocean. One chooses not between relationship and individual autonomy, but between varying forms of interdependence” (p. 242). In this perspective, postmodern individuals are never alone, even when they are isolated from others’ physically. I may speculate that solo travel is simply one form of relatedness and as travelers move through

places, their pattern of relationships change such that they can construct and reconstruct their identities. “One is born into relatedness, both defined by it and defining of it, upon one’s death, it is a pattern of relationships that perishes” (p. 243).

I acknowledge that analyzing data through identity theories is only one way of understanding this group of people. Within the concepts of saturated self, protean self, and presentation of self, this research opens up new ways of looking at travel in the postmodern period and lends insight into how travel may impact individuals’ relationships with their communities and society as a whole.

### **Connecting research findings to design**

Similar to design project 1, I used the travel activity framework again at this stage to connect the findings to design. Analyzing the interview data through identity theories helped obtain a new understanding of solo travel and allowed me to empathize with solo travelers, which is the first step in the HCD approach. As discussed in the methodology chapter (Chapter 3) a traditional HCD approach consists of six steps: define, discover, synthesize, construct, refine, and reflect. At this point, I have defined the project, discovered and synthesized solo travelers’ needs through identity theories, and I am now at the construct step. Similar to design project 1, creating personas is not required for a project with only one stakeholder (Cooper, Reimann, & Cronin, 2007).

Identity theories inspired a host of design ideas that focused on the three aspects of identity (protean self, saturation self, and the presentation of the self). These ideas were classified into three main groups:

**Design Ideas - Group 1:** Interactive technologies that support how solo travelers present themselves by giving them control over what to share, with whom, and how.

#### **Design example for group 1**

Currently, solo travelers (and travelers in general) use various tools to present themselves to the world. Solo travelers talked about using Facebook mostly for posting intimate photos with a short comment, “cheesy selfies” that they did not find appropriate to share with publicly, checking into places as they travel, or for a short reflection.

Instagram was used to present more artistic and adventurous selves, photos of the sceneries, photos of themselves taken by others—usually in front of a nice or well-known background, and photos of those they met along the way. These photos were generally edited to look more dramatic. Senior travelers preferred Flickr and photobucket.com because they found these services to be more professional—and these two websites were launched over a decade ago, but younger individuals preferred Instagram and Pinterest, the latter allows individuals to create a personalized feed which was appealing to some solo travelers.

Solo travelers also mentioned blogs as outlets for thoughtful posts that usually included at least one beautiful photo. Blogs often offered words of wisdom, insights, and reflective thoughts on travels. One of the solo travelers told me a few weeks prior to his trip that he'd like to blog during his travel because he thinks it'd help him with his future career when he returns after his extended trip. P15, a 30 year-old, single male from the fellowship group, said,

“I have one blog post, and I started a couple of weeks ago. And the idea behind that was I made a few connections in the [name of a place] and I don't want to just disappear and have them forget who I am. It will be a fun way [...] to keep in touch and keep my name in the back of these people's minds so when I get back I maybe email them and say hey do you want to grab a coffee and talk about [place name] stuff and they say oh yeah I remember this guy who has been doing this. It is just a good way to keep professional connections and it's something that shows that I am thinking about the places [...]. Things that are a little more academic sounding than a typical blog post. But this is all planning, we'll see how it goes.”

He (P15) shared his blog URL with me, and he successfully blogged throughout his travel. He also emailed me a few times during his trip to reflect on our interview and share blog posts.

Three of the solo travelers have self-published books about their travels, and two others said they were planning to write one. Some of the solo travelers had published articles in travel sections of newspapers or other travel venues like National Geographic. Giving talks and participating in solo travel events with high visibility was also mentioned.

Overall, there are many effective tools that allow solo travelers to express themselves. The ideas I generated on this front closely resembled existing platforms, and a quick search in Apple iTunes and Google Play reveals plenty of similar apps with small user bases that were almost abandoned.

But many experienced solo travelers wanted to distinguish themselves from newcomers. For example, P5 (a 30-year old single female from the self-funded group who had traveled solo for over 5 years) pointed out that she was amongst the early solo travel bloggers. She said,

“I was really excited about the trip I was going on in 2008, my parents were reading my blog, my best friends back in [name of cities] were reading it and so I was blogging [...] and then a couple of years later travel blogging exploded and there were thousands of blogs and I was like, well, why are you blogging? [...] separating from the blog helps me keep a distance from the world that is kind of ... I guess a lot of people talking about themselves and the idea of you know how Facebook is the presentation of our best selves. They only post our successes and that’s the travel blogging world and I didn’t really want to be a part of that. And I alternate with whether or not I can handle it in addition to my travel.”

She (P5) had traveled solo for over 5 years, and she was about 30 at the time of interview. As a young woman, she experienced so much as a solo traveler and had plenty of time to reflect on her travel. She still wanted to share his experience with others, and specifically encourage American women to travel; however, she had not found the right medium for that. She has published articles in travel journals and self-published a book, but these tools didn’t satisfy her needs to be regarded as a candid expert.

Another quote that illustrates experienced travelers’ desire to distinguish themselves from new travelers reads,

“The young backpackers who came here on working holiday visas (and there are so many) may have learned to walk when I learned to drive, but we share a deep bond. We are connected by a fundamental desire to see the world. [...] It’s beautifully refreshing watching bright-eyed, bushy-tailed travelers see things for the first time. It helps me remember the wonder of travel (Nomadic Matt Weblog, 2016).

Interviews with experienced solo travelers were full of remarks like this, and some discussed how important it is for solo travelers and backpackers to exemplify their travel experience. For example, P5 (a 30-year old single female from the self-funded group who had traveled solo for over 5 years) said,

“ ... after several years of the same sort of conversations, like *every* conversation at a hostel starts the same way: ‘how long have you been on the road?’ You know, et cetera, et cetera. I started being a little bit more selective.”

These remarks illustrate that while solo travelers find it rewarding to be acknowledged as an experienced traveler, they also wanted meaningful exchanges, like helping other women travel solo, as opposed to bragging and engaging in small talk.

One's desire for more authentic presentation where one could share tips and wisdom, led to the design of Guiding Light, an app that I explain below.

**Guiding Light** is a free smartphone app for all travelers and travel aspirants that requires registration (Figure 2). During the registration process, the user must specify either a Sage or Protégé membership. Sage membership is for experienced travelers who are willing to help others with travel-related questions. The app uses gamification algorithms to encourage participation. Protégé accounts are for inexperienced travelers or those planning first-time trips. As protégés travel and become more experienced, they can help others and answer questions and level up in the system. When they reach a certain level, they can upgrade to a Sage membership. The app can connect to Facebook, Instagram, and Flickr.

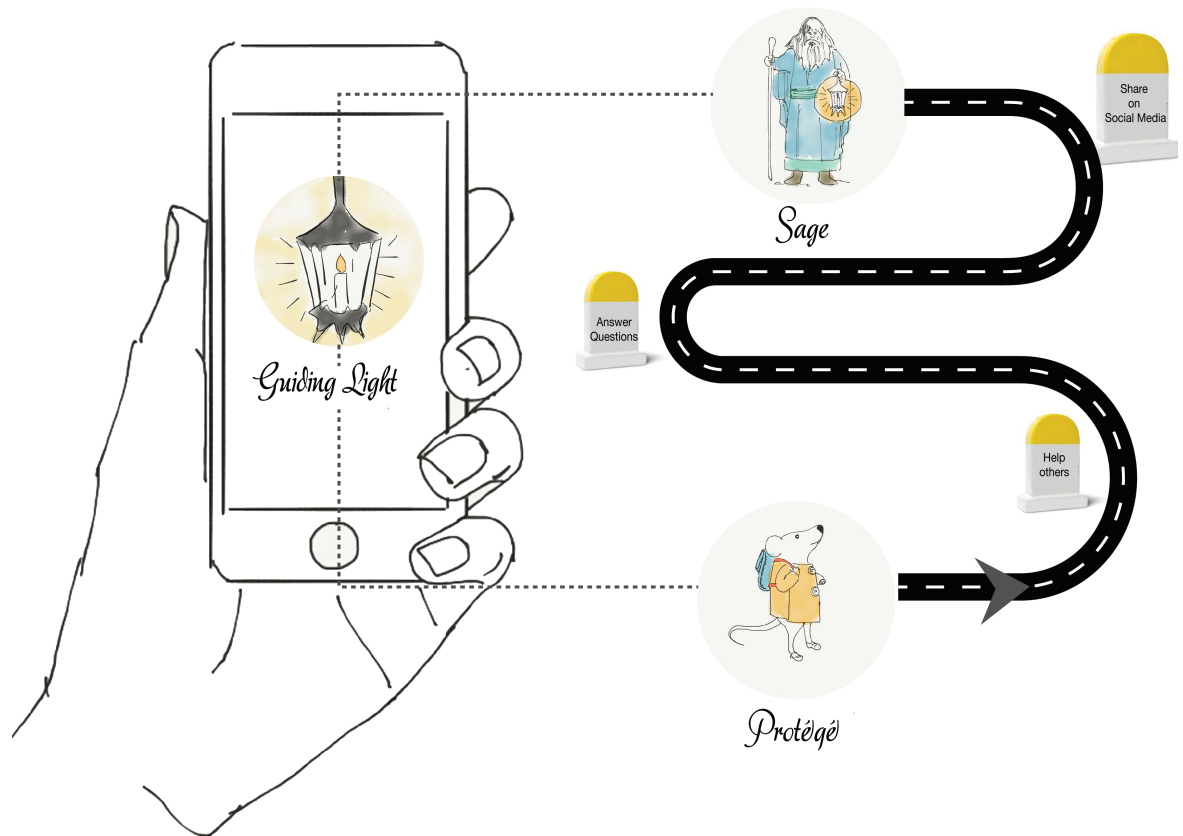


Figure 2- Guiding Light. Early sketch.

**Design Ideas - Group 2:** Interactive technologies that will allow solo travelers to manage their relationships (i.e. build, maintain, or create closure).

Generating design ideas for this group was challenging because it requires prior knowledge about the user's relationships. This means that the tool needs to have access to one's Facebook, phonebook, and other social media accounts. One prospective idea is called Exfiltr, short for Exfiltration, which I briefly describe below:

**Exfiltr** is a small tool that could be used as a plugin for Facebook or as a standalone app. Exfiltr uses a machine-learning algorithm to analyze the relationship between the account holder and their contacts, looking for patterns such as the number of times they interact, the types of interactions, the number of likes, replies, and comments, photos shared, reshares, types of groups included and privacy settings to suggest how to manage the relationship with the person, such as giving warnings before sharing a comment to groups or publicly, moving a person to a different group with a different privacy setting, and unfriending a person from Facebook altogether.

**Design Ideas - Group 3:** Interactive technologies that allow solo travelers see and reflect on how they've changed overtime. The protean self inspired this idea, where the focus is on reconstructing self through resilience and shapeshifting when needed. These design ideas aim to support the solo traveler see their transition from a less-experienced self to a new self post-travel.

**Selfbond** is a smartwatch app that could be attached to smartphone cameras and communicates wirelessly with small projector. Selfbond connects to users' social media accounts and music apps to fetch photos and songs using customizable algorithms within the app. For example, if the user selects the trajectory filter, the app would present a range of photos that represent the entire time duration of the user's trip. Alternatively, the user can select the randomizer filter to have the app surprise them, and so on. When the user is traveling, the smartphone app sends notifications reminding the person to check-in, take a photo or a short video for under 30 seconds, say a short phrase under 20 seconds, or select an emoji to record their current mood. The algorithm in the app uses this information to create a short video clip of the photos, notes, videos, etc. that can be played back at a later date.

## **Design Project 2 Limitations**

The three identity theories discussed in this chapter served as an effective lens with which to examine my interview data. They opened up new ways of interpreting the interviews, but they fell short in two ways:

(1) A second limitation of these theoretical perspectives is that the identity theories discussed in this chapter are center around abstract conceptualizations, not actions. Design practitioners like to observe actions, ask questions to understand people, and then design. Because what happen in one's mind is not observable, design practitioners may feel these theories aren't very helpful.

(2) Another limitation concerns the language that is used to discuss identity theories, which is different from the language that design practitioners use. Not understanding the language makes it challenging to see how these theories can translate into design practice.

My attempt at using these theories suggests that they are useful descriptive constructs but are not designed to be generative in terms of helping produce design ideas. Design practitioners need theories that have direct applications, so theories that only describe what *is*, are of limited use.

## **Design Project 2 Discussion**

In design project 2, my goal was to explore the role of identity theories in designing interactive technologies for solo travelers. These three identity theories brought light to the issues present in the data during the coding process in design project 1 and helped me be more empathetic with solo travelers. While these empathies inspired various design ideas, the three theories did not equally contribute to the applied design ideas.

The saturated self discusses how changes in Western culture, due to the advances in technology, support virtual social interactions. As previously discussed, the saturated self is concerned with managing social relationships and the construction of self, as well as the creation of multiple selves. The abundance of social media tools that are designed to create and manage relationships tie closely to features of the theory. The close connection between the saturated self and interviews about the influence of technology was a natural fit. The saturated self had an informative and explanatory role that helped me understand the role of social media in constructing one's identities through travel, especially as it highlighted different dimensions of

social relationships (intense, short-lived, multiplicity, etc.). The theory was useful in grounding and substantiating my design ideas that catered to managing relationships on social media.

Similarly, the presentation of self's theatrical language made the theory relatable even though it was developed in the 1950s using a less common language. This theory highlighted the tendency to use solo travel as a means to perform on the world stage. This type of identity fits nicely in today's contemporary lifestyle and social dynamics, which can be seen on the internet and social media as P5 said, "I guess a lot of people talking about themselves and the idea of, you know, how Facebook is the presentation of our best selves." As this quote shows, P5, a 30-year old female who had traveled solo for over five years at the time of interview, referred to words from Goffman's theory throughout the interview, which is an indicator of the relevance of this theory to solo travel.

Unlike the first two theories, the protean self posed more of a challenge because it focuses more on inventing and reinventing ourselves through shape shifting in response to hardships and changes in travel. The protean self helps individuals seek alternative ways to turn an unfavorable situation to something more bearable and meaningful. These concepts made it more theoretical and abstract than the other two theories.

As discussed in the design ideas section, these theories generated different design ideas. The saturated self theory inspired designs to manage relationships and make sure solo travelers do not feel overwhelmed by additional social interactions. The presentation of self ideas were directly related to one's online presentation. And the protean self inspired ideas that could help solo travelers see the change in their identity throughout the travel.

In addition, the activity framework developed in design project 1 similarly brought focus to the design ideas. For example, the framework helped prioritize interactive technologies that would support exploration activities that connected to presentation of the self theory. The framework also provided a way to compare and contrast design ideas for different types of activities. For example, in what ways do designing technologies support the presentation of self for travel preparation activities?

Lastly, I chose the three identity theories 'ectically' (Rogers, 2004), based on the literature review of travel, patterns I saw in the interview data during initial open coding, and discussion with scholars familiar with the identity theories. I intended to adhere to the epistemological

stance of these three theories when I applied them to the interview data. However, connecting the findings to interaction design proved challenging and resulted in cherry picking aspects of the theories that seemed to fit best. Rogers discusses selectively applying theory as one of the problems of borrowing perspectives from other disciplines. She wrote, “Remaining faithful to the epistemological stance of a theoretical approach can make it difficult, if not impossible, to then provide a framework for applied concerns. A problem of doing this [...] can be a dilution and oversimplification of core concepts, which then become susceptible to misinterpretation” (p. 132).

Problems related to borrowing theories from other domains are not limited to interaction design. In the field of education, scholars also adapt and adopt discourse from other domains, such as psychology or sociology. As Davis and Sumara (2006) discuss, these borrowed theories often tend to be “strictly descriptive, focused much more on the characterization of a specific phenomena than on how one might go about affecting that phenomena” (p. 129). The same criticism could be extended to design because the borrowed theories cannot be constructed as theories of design. These issues might be related to the particular pragmatic nature of the interaction design, which is the concern of those in the education field as well.

I also did not separate the theoretical analysis by each group of activities, which in retrospect could have ensured greater precision in my findings. As shown in this chapter, combining all three theories in the analysis of each activity was helpful in comparing and contrasting how they supplement each other in various ways. However, combining the analyses made it hard to tease the findings apart based on each theory to arrive at a better understanding of how each theory contributed to understanding solo travelers.

## **Development of a new design process**

As illustrated in the analysis section, I scaffold my analysis of the interview data in design project 2 with two perspectives: (1) three identity theories, and (2) an activity framework. Each identity theory focused on a different aspect of identity and, likewise, the activity framework includes four dimensions. I combined all three theories to each group of activities and discussed the findings. For example, I analyzed preparation activities through all three theoretical lenses. This analysis represented a sociotechnical aggregation of solo travel activities and identity theories.

Below, I constructed a matrix where the three identity theories comprise the columns and the four activity dimensions made the rows to illustrate the structure of my analysis. (Matrix 1)

	Saturated self + Protean Self + Presentation of self
Activity dimension 1 - Preparation	Data analysis 1
Activity dimension 2 - Acclimatization	Data analysis 2
Activity dimension 3 - Exploration	Data analysis 3
Activity dimension 4 - Reflection	Data analysis 4

**Matrix 1** - Mapping identity theories and the four dimensions of travel activity

Matrix 1 shows the relationship between the four dimensions of travel activity and the three identity theories. This matrix also illustrates the number of possible ways to analyze the data using this scaffolding.

As discussed earlier, I aggregated the three theories in the analysis of the interview data. However, these three theories could be applied separately. Separating the application of the identity theories would provide more structure to the data analysis, which could make the communication of the findings more granulated. In addition, it could potentially help scope down and generate more design ideas. Below, I illustrate the expanded version of mapping the theories with the activity framework.

	Saturated self	Protean Self	Presentation of self
Activity dimension 1 - Preparation	Data analysis 1	Data analysis 5	Data analysis 9
Activity dimension 2 - Acclimatization	Data analysis 2	Data analysis 6	Data analysis 10
Activity dimension 3 - Exploration	Data analysis 3	Data analysis 7	Data analysis 11
Activity dimension 4 - Reflection	Data analysis 4	Data analysis 8	Data analysis 12

**Matrix 2**- Expanded version of mapping identity theories and the four dimensions of travel activity

The shift from the aggregated version of the theories to the expanded version could potentially yield eight more ways of analyzing the data that provide more nuance. For example, an analysis of Goffman's theory of the presentation of the self as it pertains to photography from the exploration dimension would lead into different results than if I were to analyze the same activity through Gergen's saturated self theory. Even though different theories are used throughout the previous chapter, it puts the onus on the reader to tease apart the pieces.

In addition, the extended version of mapping (Matrix 2), clarifies the relationship between the activity dimensions and potential design ideas. The ability to make direct comparisons between the three theories based on activity dimensions would substantially help connect the research findings to design. Matrix 2 provides a systematic way of mapping theory and research dimensions to create design spaces, and gives each dimension an equal space to be considered and included in design conversations.

My goal in this chapter was to explore the opportunities to design interactive systems through a theory perspective, and this matrix has the potential to facilitate these design conversations. As discussed in Chapter 2, theory has had limited impact on interaction design in the HCI field, but, Matrix 2 connects theory to design and can potentially be a useful tool for design practitioners.

In design project 3, I discuss the application of this matrix to design opportunities for solo travelers, wherein I address the third research question: *How can human motivation theory help navigate between phenomenological experience and interaction design in the domain of solo travel?*



# Chapter 6. Design Project 3: Human-Centered Design Perspective

In design project 3, I took a Research through Design (RtD) approach and worked with 16 emerging designers over 11 weeks to explore opportunities to design interactive systems for solo travelers sociotechnical needs. In this chapter, I explore the third research question: *How can human motivation theory help navigate between phenomenological experience and interaction design in the domain of solo travel?*

## Section A- Setting up the design project

At this stage, I had fully immersed myself in the interview data and coded it through multiple perspectives. I had also come up with several design ideas that I described in design projects 1 and 2. The deep immersion in the data coupled with my own experience as a solo traveler would make it difficult to maintain objectivity and avoid bias, especially when trying to analyze the data from a new perspective. In addition, my personal experiences as a solo traveler could keep me from understanding and identifying others' motivations, goals, and emotions, which are key in HCI design. In design project 3, I work with a group of design researchers to address or mitigate my own biases.

### Project collaborators/Emerging designers

I developed the Solo Travel Project with the objective of generating design ideas for solo travelers. To promote it, I posted a promo on the University of Washington's HCDE website<sup>8</sup> looking for 10-12 individuals interested in designing interactive systems for travel. The individuals needed to have design skills and be familiar with the HCD approach to qualify for this project. Table 2 shows the demographics of the emerging designers.

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<sup>8</sup> <http://www.hcde.washington.edu/research/archives#turns> - Accessed Feb 21, 2017

Designers	Gender	Department	Year
D1	M	Pre-Engineering	Undergraduate (Sophomore)
D2	M	HCDE <sup>9</sup>	Graduate
D3	M	HCDE	Undergraduate (Senior-final quarter)
D4	F	HCDE	Graduate
D5	F	Information Management	Graduate
D6	F	Pre-Engineering	Undergraduate (Sophomore)
D7	M	HCDE	Undergraduate (Senior)
D8	F	Information Management	Graduate
D9	F	HCDE	Undergraduate (Senior)
D10	F	iSchool <sup>10</sup>	Graduate
D11	F	HCDE	Graduate
D12	F	HCDE	Undergraduate (Junior)
D13	M	Pre-Engineering	Undergraduate (Sophomore)
D14	M	HCDE	Undergraduate (Junior)
D15	F	HCDE	Undergraduate (Senior- final quarter)
D16	F	HCDE	Undergraduate (Senior-final quarter)

**Table 3-** Demographics of the emerging designers participated in design project 3

I used Zimmerman, Forlizzi, and Evenson’s (2007) definition of “designer” and “design researcher” that have been synthesized with HCI definitions. According to the authors, “the term designer is generally used to refer to someone who has had training or extensive practical experience in a discipline such as architecture, product design, graphic design, or interaction design.” Also, a design researcher is someone whose focus is on “producing a contribution of knowledge and [...] not the work to more immediately inform the development of a commercial product.”

<sup>9</sup> Human Centered Design & Engineering

<sup>10</sup> Information School

I received about 40 applications to join the project, many from whom have traveled solo in the past or were planning to travel solo in the near future. The applicants had diverse academic backgrounds such as psychology, history of science, art, management, information science, and engineering. Due to the high number of qualified applicants, I selected 16 individuals (4-6 more than I had originally planned) for the project. The applicants had certain design and research skills and were familiar with design processes, but they were not professional designers or researchers. I regarded selected applicants as emerging designers because they were undergoing design trainings, but in this chapter I refer to them as designers for the sake of simplicity.

### **Project structure**

I took a Research through Design (RtD) approach to guide design efforts. Christopher Frayling introduced RtD 1993. Frayling did not provide a clear or operationalized definition for his approach, but in the HCI community, RtD is broadly defined as a way of conducting scientific inquiry through methods and processes from design practice (Zimmerman, Forlizzi, & Evenson, 2007). It is important to emphasize that RtD is a research approach, not a design method. RtD does not provide tools and guidelines to support design practitioners through the design process, but is instead focused on conducting research through the act of design. In other words, design skills are required in the RtD approach. RtD was helpful in guiding this design effort because:

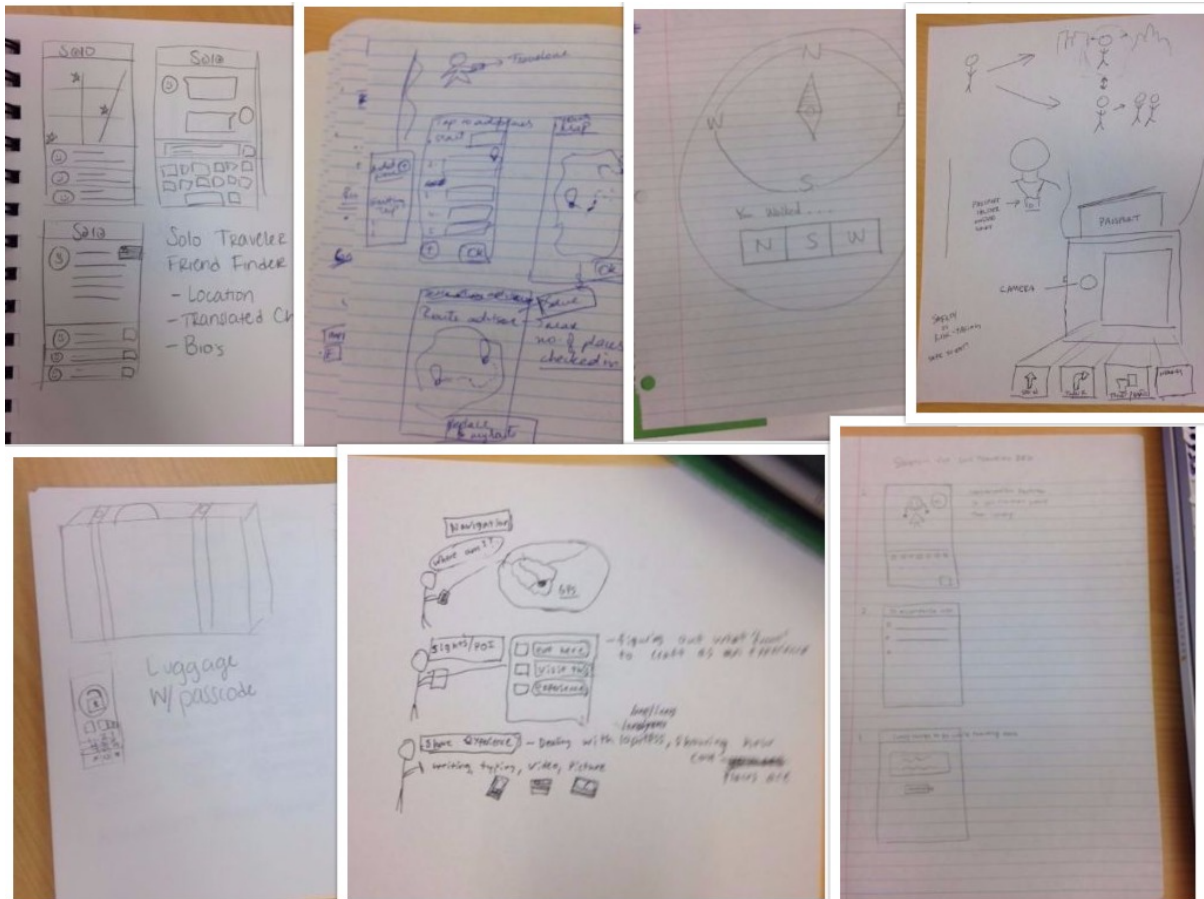
- (1) Its focus is on discovering and producing knowledge through design activity.
- (2) It gives designers the liberty and flexibility to design new ideas and to experiment without being bounded to the industry conventions because the goal is to learn from the design process as opposed to ship a commercial product.
- (3) It accommodates interdisciplinary teams working on a project from various perspectives.
- (4) It emphasizes on documenting and reflecting on the design progress.
- (5) It encourages designers to share their findings and discuss patterns with other designers to extend the work.

Taking a RtD approach, the group's focus was to create knowledge through the process of design, and to that goal, we documented every session and the design progress throughout the 11 weeks. At the end of the eleventh week, the designers reflected on various aspects of their design activities and shared it with me in writing.

I have included the schedule and sequential explanation of the project in Appendix I, where I give a brief description of the activities we completed in each session as well as the preparation week prior to the first session. I discuss the design processes and activities in the following sections.

### Design charrettes

Prior to adopting a HCD process, the designers were asked in the first session to individually sketch or describe what they would like to design for solo travelers. The designers had come to this first session having browsed a minimum of three solo travel blogs. They shared their observations and any relevant solo travel experiences, then sketched or described their design ideas. Figure 3 shows a collage of some those ideas. Three of the designers were not present in the first session.



**Figure 3-** A collage of initial design ideas

An interesting initial observation was that seven of the 13 sketches were related to safety; these included a luggage with a passcode, a smart neck passport holder and wallet, a safety drone that

follows solo travelers, and a smart wristband that would alert the solo travelers when they've gone off the path. Others sketched three variations of friend finder and social media apps, an app to count the miles one has walked, an app that helps with checking in at the airports, and a navigation app.

When I asked designers about their rationale for these proposals, they mentioned things such as shows like Survivor-man or Man vs. Wild or similar TV shows that focus on survival techniques (food, water, shelter) to keep one safe enough until they get rescued. The designers also relied on their intuitions that a solo traveler is alone so they need something to keep them entertained. I discuss these initial design ideas in details in Chapter 7.

### **Human Centered Design (HCD) approach**

HCD focuses on the user and builds designs based on users' needs and desires. To familiarize the designers with solo travelers' priorities, I distributed a selection of the interview data, notes about my interview process, and memos over the first few weeks. At the beginning of each session, the designers asked me questions about the interviews before we moved on to the design activities.

As discussed in the methodology chapter (Chapter 3), there are several approaches to HCD and for this project, I chose the Design Thinking model (Stanford School, 2017), which includes five steps: empathize, define, ideate, prototype, and test.

### **Selection of sample of interview data**

I systematically developed four sets of interview data and distributed each set to all 16 designers during the first four weeks. This way, all of the designers received the same sample set each week. Each set of sample interviews had an average of 20,000 words and included interview excerpts of 4-6 solo travelers. Using this selection method, all the participants were represented in the sample data, so the designers ultimately saw passages from every participant.

I chose some of the most interesting statements on the use of technology and on solo travelers' preferences to include in these materials. There were three categories associated with these samples: (1) mentions of technology and how it was used, (2) experience and relationship maintenance (build, maintain, or create closure), and (3) strong emotional feelings.

## Step 1 - Empathize

The Design Thinking process emphasizes the needs of the user demographic in concept development. This makes Design Thinking a suitable approach for my design project because my goal was to design for solo travelers' sociotechnical needs. The Design Thinking process consists of need finding, understanding, creating, thinking, and doing. Empathizing is defined as, "Work to fully understand the experience of the user for whom you are designing" (Stanford School, 2017).

The designers received the first set of interview excerpts at the end of first session and were asked to look for solo travelers needs and desires, paying special attention to "unspoken needs," if any. Each designer read the interview excerpts individually and coded travelers' needs they saw in the data. We discussed these conclusions each session, and the designers made affinity diagrams each week.

In addition, the designers were asked to think deeper about the real needs of solo travelers—beyond what was manifest in the data. For example, in first coding session, some designers listed access to internet and Wi-Fi as needs. However, as they moved forward with the coding process, they started to think about *why* solo travelers needed access to the internet, and the foundational needs one satisfies through internet connections.

Each session also included literature readings to familiarize the group with findings, coding techniques, and other emergent topics to help the designers along the way. Our goal was to refine the codes and synthesize them until all 16 designers reached a consensus.



Figure 4- Affinity Diagrams

During week four, the affinity diagrams and examination of needs obtrusively connected with Maslow's hierarchy of needs. The emerged themes strikingly matched Maslow's hierarchy of needs, even in terms of terminology. For example, the designers used phrases such as "Safety needs" and "Social needs" that matches Maslow's hierarchy of needs. This similarity in the terminology was first identified by D14 who had studied philosophy. Other designers also pointed out this striking similarity. I include examples of the quotes the designers had extracted from the interview transcripts in the following section along with a description of Maslow's theory of human motivation. To familiarize ourselves with Maslow's theory, the designers and myself read and summarized the literature. By week 5, the group had decided to use Maslow's expanded hierarchy of needs to help understand the data. Maslow's original five-stage model was expanded to include three new stages. Here, I provide a brief description of Maslow's original and expanded models.

### **Emergence of Theory: Maslow's theory of human motivation**

Abraham H. Maslow was an American psychologist and author of several books on motivation, religion, psychology, and personality. Maslow's theory of human's hierarchy of needs (1943) was first introduced in his book, *A Theory of Human Motivation*, which is still widely read and taught. Maslow's original theory consisted of five fundamental levels of human needs, and the theory is usually portrayed in a pyramid. Maslow argues that when one's lower level needs are satisfied, then the upper level needs take precedence. For example, if the physiological needs (first level) are gratified, then people move on to the next level (safety), and so on. Maslow later added three more stages to the original five-stage model:

**1- Physiological needs** are at the bottom of the pyramid and include requirements for human survival such as food, air, and shelter.

"When I was in Ecuador, Peru, it [SteriPen] was my only way of getting clean water. And then in the Southern Cone, you can just drink water from the tap. That was nice." P18 (a young female in her mid 20's from the fellowship group)

**2- Safety needs** include personal security, financial security, health and wellbeing, and safety from accidents.

"I push a button and it sends them the mil coordinates of exactly where I'm staying and this is such a great peace of mind for them and the technology these

days is really amazing.” P2 (38-year-old single female from the self-funded group who had traveled solo for over 2 years)

One of the designers added an annotation to this quote: “has confidence that family knows location and is safe, allows solo traveler to be independent.”

**3- Love and Belonging needs** help individuals form and maintain relationships. Maslow believes that people need to feel accepted among their social groups including family, friends, work groups, and so on.

“My mother hid away in my bags a little snack sized sandwich baggie of bunch of cotton balls that she had soaked in her perfume. And so, whenever I was lonely I could smell home and it was safe and comfortable. So when I left before my trip, she snuck one of those baggies in. It makes me a little emotional thinking of it. My mom and I are very close, my parents and I are very, very close. [...] when I saw that baggie I started crying. But there was a couple of times on that trip when that little bags of cotton balls really saved my spirits. Because there was some hard times on the road.” P13 (a 38-year-old single male from the fellowship group)

One of the designers noted, “This type of sensation and feeling loved gave him [the solo traveler] confidence to continue his travels.”

**4- Esteem needs** are about the need for self-respect and self-esteem, which is usually gained through activities that stimulate feelings of contribution or value. Maslow divides the esteem needs into two levels, the higher level reflects on the need for self-respect and the lower level esteem needs are related to respect from others.

“I remember the panic attack... I was just on and off terrified that it was going to be a terrible idea, that I was going to fail and that I wasn't going to be able to hack it, and I was going to want to come home, bad things were going to happen.” P5 (a 30-year old single female from the self-funded group who had traveled solo for over 5 years)

The above quote was annotated by the designers as, “self doubt, low esteem when starting to travel.” The following quote was annotated as, “Esteem boosted from challenges and people around.”

“I feel like if I love what I'm doing and I feel challenged and just the positive energy from people that I meet every day. It just keeps me going, you know?”

P2 (a 38-year-old single female from the self-funded group who had traveled solo for over 2 years)

The next quote was annotated as, “Self esteem increases from people back home sending positive messages to the solo traveler.”

“[Encouragement from people] makes my day, it makes my week, it makes my month. It helps so much. And sometimes I haven’t checked the internet for a while, and I get some really nice messages and it’s- it’s huge, it means the world to me.” P2 (a 38-year-old single female from the self-funded group who had traveled solo for over 2 years)

**5- Cognitive needs** refer to knowledge and understanding, curiosity, exploration, need for meaning and predictability (Maslow, 1970).

“It’s really hard to just kind of go, oh I’m going to analyze everything about this place now, so I really just take the ones that what is the impact of my experience of having people like me, white people just trapeze through Africa like trying to tell the narrative of somebody who’s there working in the cultures and asking questions.” P19 (a young female in her 20’s, from the fellowship group)

**6- Aesthetic needs** are about the search and appreciation of beauty, balance, and such.

“I realize that the part I loved most about taking a photo is the moment that I stop on my bike and maybe I get off my bike and I sit down on the grass and soak up the beauty and moment, and I was like that’s the part that I love. Like of course it’s nice to have a photo but I think I was craving more of that. It’s the time that you take and you know you’re appreciating the scenery so I was like, well, I would just have to stop more and be more conscious about stopping now and so that helped a lot but then I got used to not taking as many photos.” P2 (a 38-year-old single female from the self-funded group who had traveled solo for over 2 years)

**7- Self-actualization** needs refer to realizing and reaching one’s full potential. At this level, people set different goals to reach their level of self-actualization. For example, one person might want to be a really good teacher or parent and the other person would have goals such as learning multiple languages, or becoming a renowned artist.

“I wrote down some goals like, I have done this, I really wanted to couchsurf, hike on mountain in South Africa, and I gotta do something crazy next time.” P17 (a young male solo traveler in his mid 20’s, from the fellowship group)

One of the designers annotated this quote as, “shows that travelers want to go out of their comfort zone and also explore more in an area, hence leading to self actualization.”

**8- Self-transcendence needs** are related to religious and spiritual practices and refer to “the very highest and most inclusive or holistic levels of human consciousness, behaving and relating, as ends rather than means, to oneself, to significant others, to human beings in general, to other species, to nature, and to the cosmos” (Maslow, 1971, p. 269).

“I have a terrible temper but I am better at keeping it in check and that was one of those things where it’s like, is this the person that I want to be?” P16 (a young male in his 20’s from the fellowship group)

Traveling solo helped P16 to work on her short temper as a means to be a better person in life because it would allow her to relate more to her surroundings and other people.

### **Connecting theory to design**

At this point in the project, the designers were satisfied with their level of understanding of the solo travelers’ needs and felt that they could empathize with them, and used Maslow’s hierarchy to break down the needs into foundational states. The designers had also read various solo travel blogs and watched videos posted by solo travelers, which helped them obtain a more complete picture of the domain. The designers would share and discuss these blog posts and videos with others via the online tool we used for this project and also in the meetings. The online tool was a shared space that allowed us to share our thoughts and reply to others’ comments.

While Maslow’s theory helped the designers feel empathetic with solo travelers needs, translating the findings into design also presented them with a challenge. Some of the designers thought they could focus on a specific need, such as need for safety, and try to address that through design. However, solo travelers raised so many dimensions of safety, such as physical safety under specific conditions, data security at certain point in travel, and securing the belongings, that it was difficult for the designers to define boundary conditions for their ideas. In addition, some of the needs in Maslow’s model were more abstract than others. For example, it was easier for the designers to imagine designs for love and belonging than for self-actualization.

The emergence of Maslow’s theory again raised the question of how to apply it to design for solo travelers? I had two major design constraints to work with,

- (1) utilizing the four categories of solo travelers’ activities (preparation, acclimatization, exploration, reflection), and
- (2) examining whether Maslow’s theory can generate design ideas

In Section B, I continue to apply the Design Thinking model and discuss how I utilized matrix 2 to guide the designs.

**Section B - Employing the matrix**

The designers’ feelings at this stage were comparable to my experience during design project 2 when I attempted to analyze the interview data through three identity theories and generate design ideas. Similar to design project 2, I had to work with two sets of dimensions (activity dimensions and Maslow’s theory dimensions). I made hypothetical comparisons between the three identity theories and the eight dimensions of Maslow’s theory of human motivation. In Chapter 5, I used the three identity theories as three dimensions of a larger identity theory, as if there is one identity theory with three dimensions. Then I replaced the three dimensions of identity theory (saturated self, protean self, and the presentation of self) with the eight dimensions from Maslow’s theory and presented that to the designers. Below is an illustration of what I draw on the whiteboard:

	Physiological	Safety	Love & Belonging	Esteem	Cognitive	...
Activity dimension 1 - Preparation						
Activity dimension 2 - Acclimatization						
Activity dimension 3 - Exploration						
Activity dimension 4 - Reflection						

**Matrix 3-** Connecting activity dimensions to the dimensions of Maslow’s theory

I did not draw the matrix with all 8 dimensions because at this point I wanted to see if this matrix could help focus and scope the designers’ ideas. The designers started by brainstorming design examples for each intersection of theory and activity dimensions. For example, they thought about how to apply exploration activities to Maslow’s dimensions.

One of the very first examples was reflecting while satisfying a physiological need. The designers developed a scenario about making a tea while having a reflective conversation with a friend. The second example was writing reflective comments inside toilets. These examples led to designs that would fit solo travelers' needs. For example, a GPS-enabled shoe that would allow the solo traveler's family or friends track them and know they are safe. As the designers started to come up with design ideas, they broke into smaller groups to share more details with one another.

### **Steps 2 & 3. Define and Ideate**

The second and third steps of the Design Thinking model occurred concurrently and iteratively after the designers were put into groups based on their design interests.

In the Define step, designers processed and synthesized the findings from empathy work (step 1) to form a user point-of-view that the design can accommodate (Stanford School, 2017).

In the ideation step, the designers explored a wide variety of possible solutions, which allowed them to step beyond the obvious.<sup>99</sup>

After the designers' initial conversations about the utility of the matrix, they selected the design spaces that would fit solo travelers' needs. The designers chose a few intersections of theory and activity dimensions and discuss what kinds of designs might work. The matrix helped designers have conversation about what exactly they'd like to produce and how it can help the solo travelers. The designers found this exercise rewarding because they were flooded by explicit design ideas that were easy to describe and communicate with others, even at a high level.

Because the designers found the matrix helpful, I completed the matrix by adding the rest of the Maslow dimensions and asked the designers to take a few minutes and decide upon three priorities. Since the designers had several design ideas, prioritizing their design spaces would help them pick the most interesting ones.

Working with 16 designers required forming smaller groups so the designers could focus on a specific design projects. Thus, I decided to leverage the designers' priorities to form groups. This way, the matrix facilitated the act of putting the designers into groups with others who were interested in the same design space.

Matrix 4 shows the distribution of the designers' first priorities inside the matrix. Designer names are anonymized and shown as D1-D15. One of the designers (D16) was not present in the session and was added to a team later. Designers' second and third priorities can be found in Appendix J.

As obvious in the table below, certain design spaces were not selected by anyone, while others attracted attention. For example, none of the designers wanted to work on the physiological needs while Love & Belonging, Esteem, and Self-Actualization were selected by six designers. In terms of travel activities, designers found Reflection to be the most popular stage.

	Physiological	Safety	Love & Belonging	Esteem	Cognitive	Aesthetic	Self-Actualization	Transcendence
Preparation					D4		D5	
Acclimatization		D1		D3				
Exploration			D2	D6 D7			D8 D15	
Reflection			D9 D10			D11 D12		D13 D14

**Matrix 4** - The distribution of designers' first design priorities

I grouped the designers based on their priorities using the Matrix. For example, D2, D9, and D10 were interested in Love & Belonging needs, and they all had selected Acclimatization and Reflection activities in their priority selections. I grouped D2, D9, and D10 design for Love & Belonging, where they could decide amongst themselves to focus either on acclimatization or reflection activities, or both.

Five groups of designers were formed based on their design interests and priorities. Four groups had three designers and one group had four designers. Using the matrix, each team worked on a unique design space. Below is the of groups:

Team 1- Love & Belonging needs and Exploration - included three team members  
 Team 2 - Esteem needs and Acclimatization/Exploration - included four team members  
 Team 3 - Aesthetics needs and Reflection - included three team members  
 Team 4 - Self-actualization needs and Exploration/Reflection - included three team members  
 Team 5- Transcendence needs and Reflection - included three team members  
 Matrix 5 illustrates the distribution of the teams based on their selected design spaces:

	Physiological	Safety	Love & Belonging	Esteem	Cognitive	Aesthetic	Self-Actualization	Transcendence
Preparation								
Acclimatization				Team Esteem			Team Self-Actualization	
Exploration			Team Love					
Reflection						Team Aesthetic		Team Transcendence

**Matrix 5** - The distribution of teams design priorities

I asked the designers why some spaces were attractive for design and others were not. They said (1) they found physiological and safety needs too boring and generic, and (2) cognitive needs were too abstract and did not fit very well with the perception of the designers from solo travel especially based on the interview data, and (3) because this project was a RtD and not meant for the industry, the designers wanted to explore more “exotic” design spaces that they don’t normally get to work on.

Designers continued their group discussions in weeks 6 and 7 and also met to work on their ideas. Designers revisited the interview excerpts to see if and how their design ideas help solo

travelers. This iterative cycle of ideating and reading the interview excerpts helped refine the design ideas.

### Connecting research findings to design

In week 7, the designers presented their ideas to the whole group and solicited feedback. Below, I provide a brief description of each of the design ideas:

#### Design idea 1 - Team Love & Belonging / Exploration

Team Love & Belonging focused on the Exploration activity groups and were inspired by solo travelers desire for meeting new people. They proposed a camera design, called SnapScent, which is a small, scent-capturing camera that also prints captions containing contact information. Team Love addressed the two dimensions by arguing that, “When travelers have a significant experience with a new friend, we imagine that they could take a picture in that moment and share the picture with their friend as a gift. The picture, very much like a polaroid instant camera photograph, will have the image captured, as well as the ambient scent in that space and text, which the solo traveler can program beforehand to include their social media and/or contact information to allow people to contact them later.” (Figure 5)

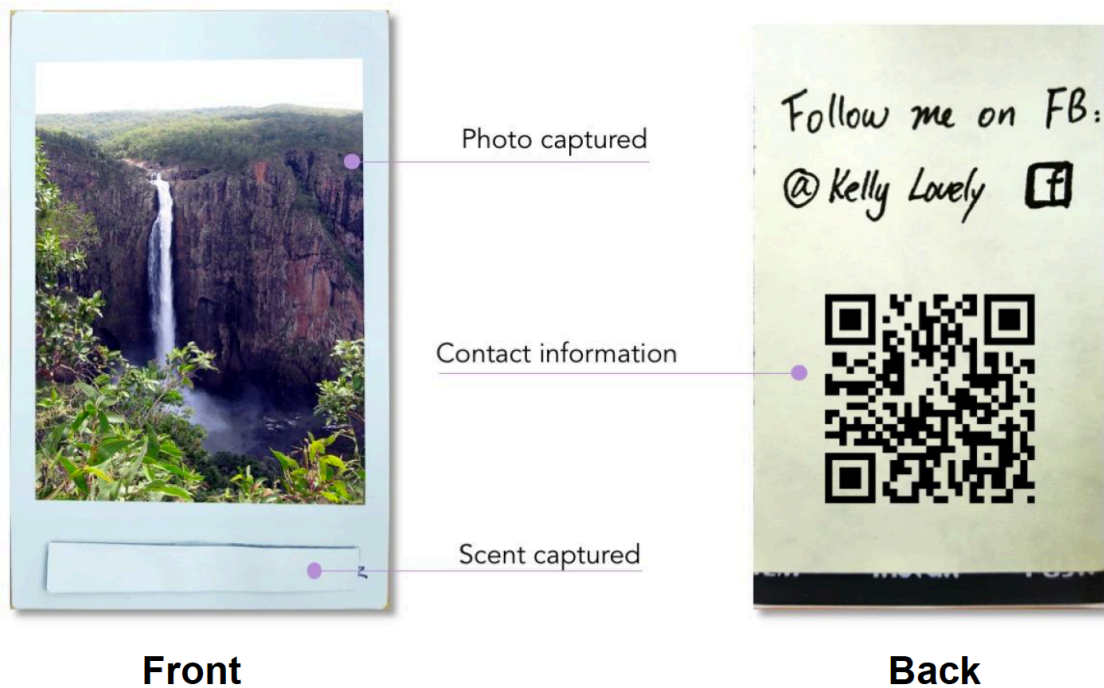
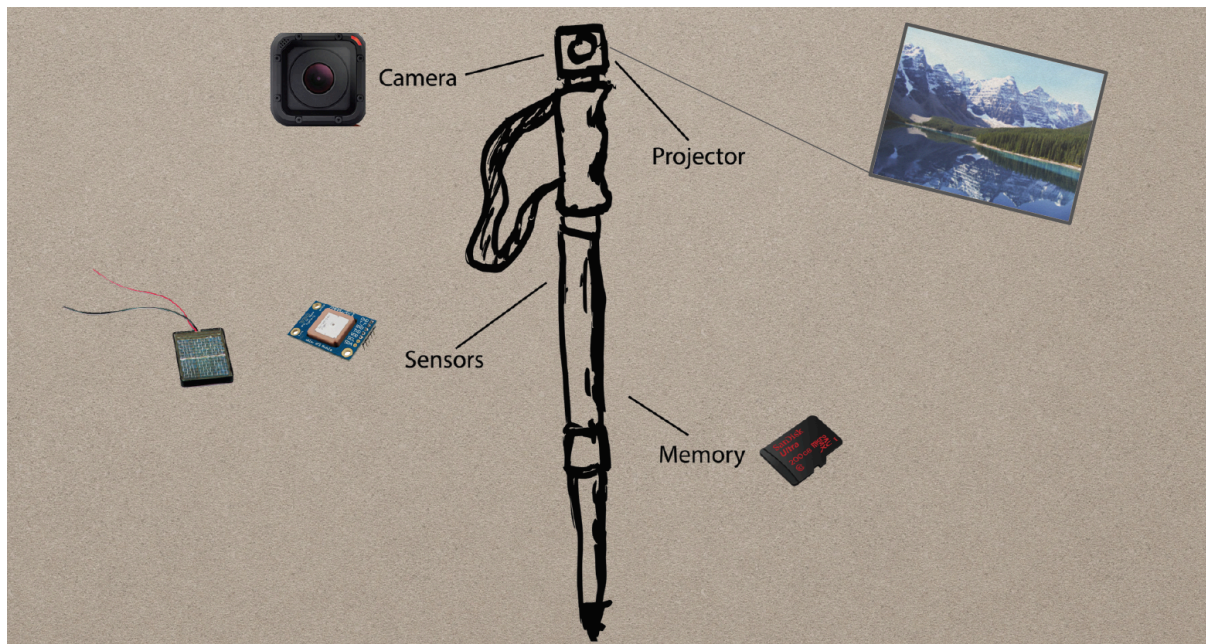


Figure 5 shows the output of the SnapScent camera. Design Idea 1

## Design idea 2 - Team Esteem / Acclimatization & Exploration

Team Esteem focused on a combination of activity groups and designed for acclimatization and Exploration. They proposed a smart trek pole called Solo Stick that could be turned into a tripod and had a small built-in camera and a pin to attach cameras to it. These features allow solo travelers to take better photos than selfies. The team extracted several quotes from the interviews where travelers talked about how sharing images of their accomplishments helped boost their self-esteem. The Solo Stick also included a memory card to save the photos, a GPS tracker to help wayfinding and sharing their locations with family and friends, and several sensors for security and a projector that would allow the solo traveler to share videos or photos with others through projecting them on a wall.

Team Esteem addressed these two dimensions arguing that hikers already use hiking poles for reasons such as increasing speed, reducing impact on legs, increasing traction, maintaining balance, defending against wildlife, and using as tent poles or emergency splints. Hiking poles help hikers feel more confident which leads to higher self-esteem. This team decided to add a few digital features to hiking poles and make hiking poles even more “esteem boosting” to empower the solo travelers. (Figure 6)

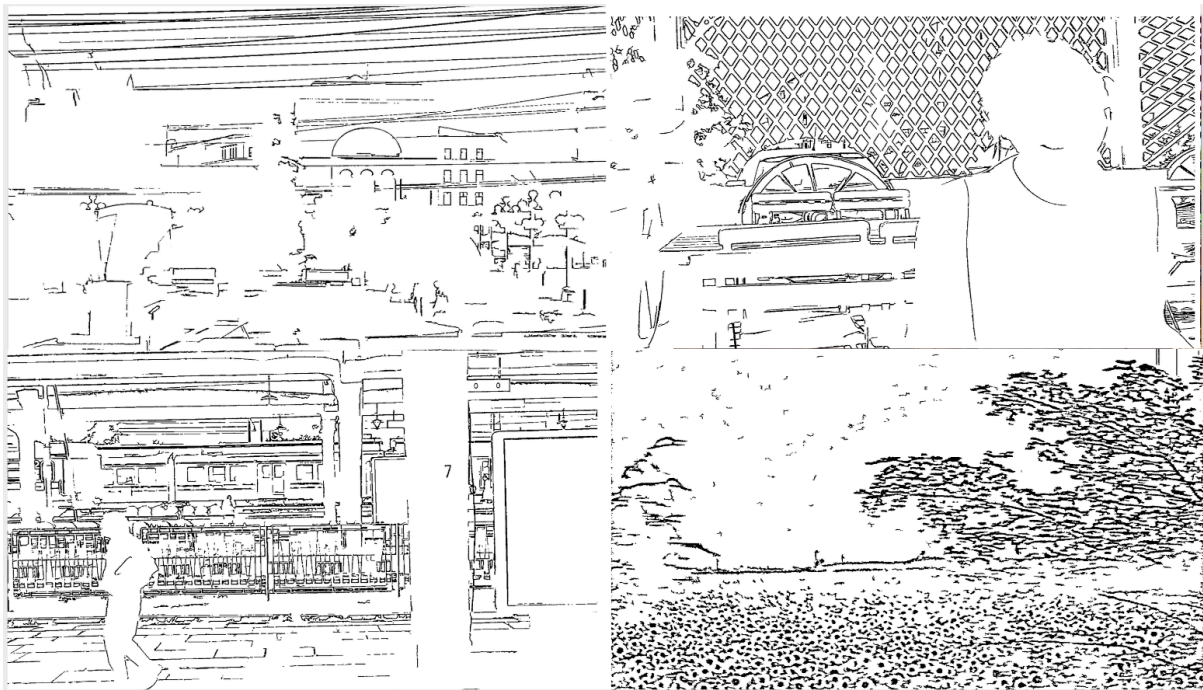


**Figure 6** shows a sketch of solo stick – Design Idea 2

### **Design idea 3 - Team Aesthetic / Reflection**

Team Aesthetic focused on reflection activities and the designers proposed a photo-taking application and online service called ColorAway. The tool empties the photos, erases the colors, and makes them abstract. Solo travelers can then paint the abstract photos, and relive and reflect on the travel experience. This team addressed the two dimensions by focusing on solo travelers interviews where they talked about photo browsing as a way to reflect on their travel and their life. Solo travelers had also talked about shooting large amounts of photos during their travels but rarely going back to look at them.

The tool would allow people to create “adult coloring books from travel photos” to help with “bringing life to an otherwise ‘dead’ photo archives via the unified engagement (mental and physical together) people enjoy through the act of coloring.” Aesthetics could be defined in various ways. This team wrote, “When we think of aesthetics, we think of people making art with their hands and minds in sync.” (Figure 7)



**Figure 7** shows a sketch of Color Away – Design Idea 3

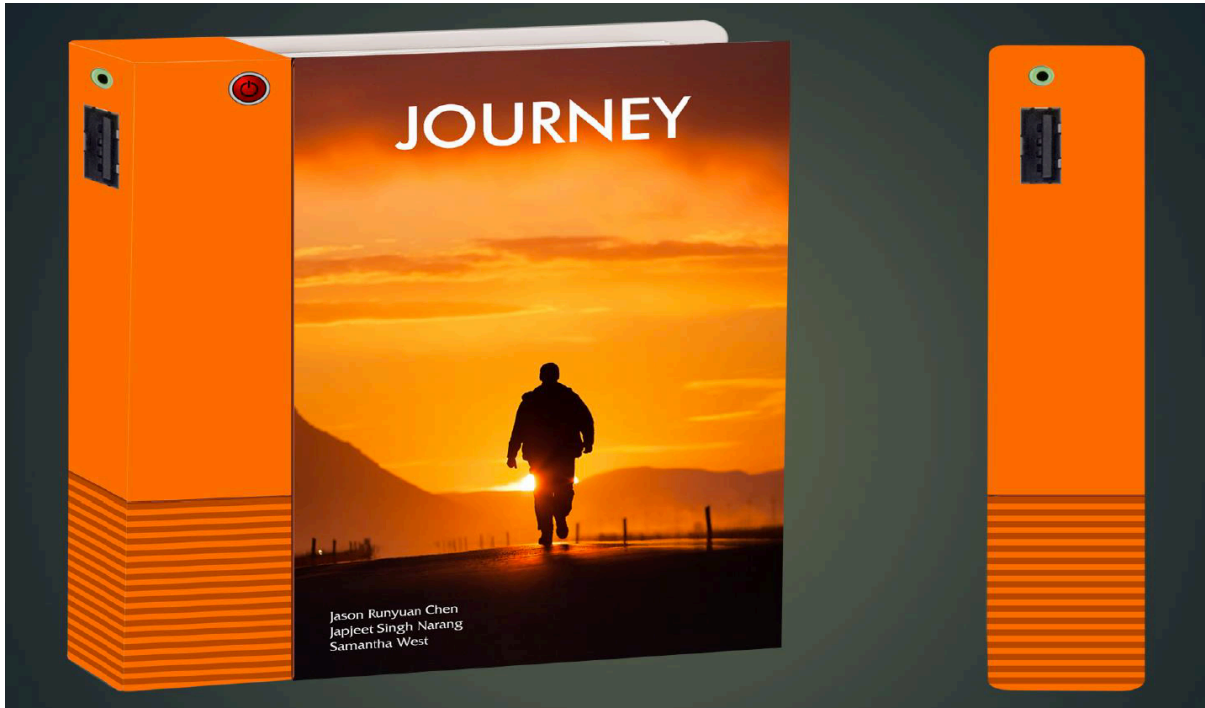
### **Design idea 4 - Team Self-actualization / Exploration & Reflection**

This team focused on a combination of activities and designed for Exploration and Reflection activity types. Building on Maslow’s theory, these designers addressed the dimensions by

enabling solo travelers to tolerate uncertainty, be spontaneous in their thoughts and actions, and foster creativity, as different ways that leads to self-actualization. I describe these features of self-actualizations in more details in the limitation section in this chapter. This group designed a “smart bandana” that featured a GPS tracker to help solo travelers act spontaneously and adventurously to explore without prior planning. The GPS tracker connects to a feature that would suggest sights nearby to explore. Smart Bandana also tracks movements and vitals as a way to record step-count, hike altitude, miles traveled and other health metrics to send encouraging messages to the solo traveler and allow them to share their adventures with others. This feature also gives the solo traveler reassurance that they are in good health and if not, would send a message to family or friends. There is a small glass-like screen that could be pulled down to see maps, text messages, and other information when needed.

#### **Design idea 5 - Transcendence / Reflection**

Team Transcendence focused on Reflection activities and created a smart-book called Journey that would provide solo travelers a means to capture their journey in a personal way and receive guidance throughout the travel. Journey included features such as an audio podcast that would allow solo travelers to share their journey and potentially become part of someone else’s journey, a personalized cover, a memory, and accepted input in the forms of text, audio, and image. Journey addresses the self-transcendence dimension based on the designers’ research that exercising gratitude is one way of reaching transcendence. In that regard, Journey provides a space to write and send “blessing notes” to oneself and also allows them to share those feelings of gratitude with others through voice, photos, or blogging. I will discuss these features further in the limitation section. (Figure 8)



**Figure 8** shows a sketch of Journey – Design Idea 3

In this step, designers transformed their ideas into a physical form so they can experience and interact with them and, in the process, learn and develop more empathy. The prototyping process started at week 8, and the first step was to develop low-fidelity prototypes that primarily consisted of sketches and paper prototypes.

As discussed earlier, we took a research through design (RtD) approach, and our goal was to learn from the process of designing for solo travelers and report our findings. Since the aim of this design effort was to explore opportunities to design interactive technology and not to deliver products to the industry, creating high fidelity or working prototypes was not a priority. However, the teams were excited about their ideas, and some of them decided to take their prototypes further and refine them as much as possible within the time frame.

#### **Step 4. Test:**

Testing is the final step in the design process in the Design Thinking method. This step implements the products and uses observations and feedback to refine prototypes, learn more about the user, and refine the original ideas.

At this point in the project, the designers were confident about the feasibility of turning their design ideas into a complete product. Although, none of the teams had a high-resolution

product to test, they tested their prototypes by recruiting potential users and presenting their work to solo travelers who participated in the final week's session.

We invited five solo travelers, unfamiliar with the project and not part of the participant pool, to come to the final session to watch the teams' presentation and provide feedback. The feedback was in two forms: (1) oral feedback after each presentation, (2) anonymous written feedback, discussed below.

Each team had 15 minutes for presentation and Q&A. The teams were encouraged to keep their presentation to 8 minutes and leave time for questions. After the Q&A, solo travelers had about 5 minutes to fill out the written forms. (See Appendix K)

The forms included some demographic questions, instruction about the sessions, and two feedback questions for each design:

1- How important do you think the need(s) this team's design tried to address are to you as a solo traveler? Please respond on a scale of 1 (not important at all) to 5 (extremely important). Please explain your answer.

2- How effectively did this team's proposed design address the identified need(s)? Please respond on a scale of 1 (not effective at all) to 5 (extremely effective). Please explain your answer. E.g., you might discuss critical, superfluous, or missing features.

The solo travelers received one form for each team with the team name printed on top of the page. After the solo travelers wrote down their feedback, the next team would present. The presentation event was documented by a third-party note-taker.

### **Evaluating interaction design research within HCI**

All of the teams created reports describing their design ideas and the design process. The teams used Zimmerman et al.'s (2007) criteria for evaluating interaction design research within HCI. This evaluation structure included four criteria: (1) Process, that shows the rigor applied to the methods and the rationale for the selection of specific methods. There should be enough details about the process so it would be reproducible, (2) Invention, that focuses on explaining why and in what ways a design represents a contribution, (3) Relevance, that focuses on the ideal state that the design is intended to trigger in the users, and (4) Extensibility, that focuses on

documenting the design research in a way that the community can leverage the knowledge derived from the work.

### **Design Project 3 Limitations**

Maslow's theory of human motivation provided a common vocabulary and discreet pieces that helped the designers discuss their design ideas as well as features and design elements. However, the eight dimensions of the theory did not equally contribute to the design process. While the lower level needs in the Maslow's hierarchy were easier to understand and act on, the higher level dimensions proved to be more challenging. Below I explain how designers regarded each dimension.

Physiological and Safety needs (the bottom needs) easily sparked many design ideas, but the designers were not excited about those spaces. The designers soon decided that they wanted to choose between the other six dimensions.

Love & Belonging and Esteem needs were also easy to understand and relate to, especially because the designers had seen many instances of these needs in the interview excerpts. Love & Belonging was the most popular second choice, and five designers selected these categories. Two teams worked on these two needs.

Cognitive needs were designers' third most common choice, (See Appendix J) with seven designers selecting it. However, cognitive needs were initially perceived as the opposite of what solo travelers intended to do. The designers thought of cognitive needs more in the context of formal education, which requires restricted planning and limited freedom.

Aesthetic was the least popular dimension. Aesthetic was initially easy to understand and talk about. However, it proved to be challenging to design for. For example, the designers talked about the need to visit beautiful places, but how could one designs for something that needs to be visited in person? Team Color Away decided to work on this dimension and found themselves searching the literature to understand how it is defined and operationalized. The team stated in their report,

“We came to understand Maslow's “aesthetic needs” as a constellation of ideas centered on expression and appreciation of beauty, creativity, and an inner sense of awareness that fuels the ‘gut sense’ of the connoisseur's recognition of something fine. We understand ‘experience’ itself as a sense to be refined, a point

of uneasy but undeniable overlap between the wisdom of the mind and of perceptions of the body. When we think of aesthetics, we think of people making art with their hands and minds in sync, but also include the moments when one feels beauty in being lost, or the times beauty and enjoyment arise from situations where discomfort and anxiety are expected. We are interested in the ground that aesthetic appreciation can grow from.”

This understanding of aesthetics, developed from interviews with solo travelers, was too broad to work productively for designers, so this group intentionally narrowed its focus to art-making as an opportunity that could deepen the aesthetic aspects of reflection for solo travelers.

Self-actualization and Transcendence encouraged a lot of conversation about meaning, but did not initially yield many design ideas. However, both dimensions were deemed interesting, such that eight designers selected self-actualization and six selected transcendence as their top three priorities. Similar to Aesthetic, these two dimensions required further reading and conversations, and both groups spent a substantial portion of their time searching the literature for guidance. These designers did not find Maslow’s definition to be sufficient in understanding and operationalizing these two dimensions. The designers realized there was limited academic literature that further discussed these two dimensions. They also failed to find literature in the design communities that could be used to or help operationalizing these dimensions.

Team Self-actualization settled with a few features they found to be relevant to this dimension. The first one was peak experience, which they defined it as,

“feelings of limitless horizons opening up to the vision, the feeling of being simultaneously more powerful and also more helpless than one ever was before, the feeling of ecstasy and wonder and awe, the loss of placement in time and space with, finally, the conviction that something extremely important and valuable had happened, so that the subject was to some extent transformed and strengthened even in his daily life by such experiences.”

The team looked for quotes in interview transcripts for relevant instances. After compiling the quotes, the team decided that peak experience instantiated in the interviews in four main ways: (1) feelings of accomplishment, (2) reaching self-boundaries, (3) being an inspiration to others, and (4) realizing self-potential. The second feature of self-actualization was helping solo travelers be spontaneous in their thoughts and actions because the literature discussed how spontaneity is another way to satisfy self-actualization needs.

Team Transcendence had an even more challenging and thorny road to reach an understanding of the dimension as a group. The designers in this team continuously worked on straightening out their understanding of the dimension up until the last week. D16, a female undergraduate senior who had missed the meeting session where we grouped the designers using the matrix, reflected on her design experience and wrote,

“Working with a team that had such a dense and unexplored topic was initially quite frustrating and intimidating. [...] we spent many weeks simply debating and analyzing what transcendence stood for, and could be defined as, for us. I played a strong hand in this repetitive debate because I was honestly nervous to begin a research through design journey without a clear understanding of what it meant to transcend, and resulting to transcend specifically for solo travelers. [...] With such a young, passionate, and inspiring group to work with, our thoughts and ideas flew out like a waterfall. [...] many whiteboards were destroyed in the process of our research and design.”

D14, a male undergraduate junior, also reflected on the challenges of working on transcendence and talked about how he benefited from reading scholarly research about this dimension. He wrote,

“When I initially approached transcendence, I had no idea what that was. The online non-scholarly articles did not help at all because they were overly-simplistic. Thus initially I thought transcendence was about finding meanings in life. [...] However, my understanding of transcendence was not solidified until when I finally read the scholarly articles in transcendence, and I found that there was a great overlapping area in psychology and philosophy, which I found it to be really interesting.”

Despite the challenges of understanding and designing for transcendence, the designers in this group found the topic intriguing and expressed interest in further working on the project at the end of the 11 weeks. The team received positive feedback and earned a high rating from the group of solo travelers. A few months later, a designer from team Transcendence continued project and submitted a paper to the CHI Conference on Human Factors in Computing Systems Research Competition. A designer from the team Aesthetic and two other designers outside our group who were interested in working on the project joined him. The paper was accepted to CHI Research Competition 2017 [complete citation was not available at the time of submitting this dissertation].

A few other designers also expressed interest in advancing their design ideas and creating a high-resolution product. We had discussion about how to patent their innovative design ideas, and the designers are planning to continue their team's project after graduation.

As evidenced by the designers' experiences and reflections, the higher the dimension was in the hierarchy of needs, the more challenging it was to design. Designers found the top two dimensions (self-actualization and transcendence) too abstract and theoretical. Unlike satisfying needs such as physiological or safety, transcendence is perceived to be an internal process that cannot be observed and is difficult to ask questions about. The designers had to read the interviews multiple times to find instantiations of transcendence and, even then, they were not very confident about their findings.

### **Design Project 3 Discussion**

In Chapter 6, I discussed the process of working with 16 emerging design researchers to develop interactive technology for solo travelers through a Research through Design approach. The group of emerging design researchers individually read excerpts of the interview data and coded them for solo travelers sociotechnical needs. After four rounds of coding, creating affinity diagrams, and analyzing the data, the groups interpreted the solo travelers' sociotechnical needs using a new perspective that differed from my approach in design project 1. This difference in perspective, which arose out of an Interpretivist approach, led to the emergence of themes that matched Maslow's hierarchy of needs.

Maslow's theory of human motivation includes eight foundational human needs, which complemented the HCD process that is also a needs-based approach. Maslow's hierarchy of needs provided a common vocabulary that appeared to be closer to the everyday terms. This common language helped the designers have a focused dialogue about the grounded needs and how to design for them, which was not the case until Maslow's theory emerged.

When selecting their design spaces, all the designers gravitated toward prioritizing a dimension from the theory and then mapped it to travel activities. In other words, the designers expressed their interest based on the Maslow's dimensions first and then decided what activities they'd like to design for. None of the teams selected preparation activities, two teams decided to focus on two activities, and three teams decided to focus on one activity (see Matrix 5). The designers

wanted some flexibility in selecting the activities, but there were no conversations around selecting two theory dimensions. The designers could imagine designing tools that could be used for two types of activities, for example acclimatization and exploration, but they could not do the same thing for the theory dimensions. It appeared to me that the theory dimensions were so distinctive that imagining a design that would address both needs was not immediately possible for the designers. However, they could see themselves designing for acclimatization and exploration together or exploration and reflection together.

However, during the design process some teams realized that their designs actually address more than one need. Team Esteem saw an overlap with Safety needs, and one of the designers in this team wrote in his reflection, “while my team selected esteem, we ended up designing for safety too because a hiking pole is used for safety reasons as well, which as a result boosts self-esteem.” Team Self-actualization also realized that their smart bandana addresses safety issues through the GPS feature and tracking a traveler’s vitals.

Although the higher level needs were inherently more challenging to understand, being able to point to specific needs and focusing the design exploration around those needs helped organize and streamline the teams’ collaborations.

A challenging aspect of brainstorming in the design process is that designers don’t know what design spaces are not explored or even exist. One potential way to addressing this brainstorming challenge is to systematically map theory and activity dimensions to identify intersections where designers initially did not look. Thus, the utility of the matrix is that it brings designers’ attention to new and unexplored design spaces. This is an important step in design explorations and a unique contribution of this matrix.

In addition, the matrix gave the designers agency by helping them independently understand the design requirements and guidelines in such a way that facilitated design. The independence of the design groups discussed here, and the fact that they designed successful tools using the matrix, serves as validation of this effective strategy.

Another benefit of using the matrix is that it helped surface both obvious design spaces and those that were more concealed. This way, the matrix helped designers find the interesting design spaces that got them excited. For example, the design opportunities in the intersection of physiological and reflection is not a very obvious design space, but perhaps it is a space worth

considering. Again, the objective of this matrix is to draw designers' attention to new possible design spaces and to help discover novel and often overlooked design spaces.

Another benefit of the matrix is how it facilitates design collaborations that bring together perspectives, thus giving designers choice and freedom to design the way they seem appropriate, while staying close to research findings and using theory as a guideline.

The matrix might be specifically helpful for new designers, because the designers here were not professionals. While more experienced designers might have learned intuitively where to look for design opportunities, new designers, especially when teamed up, need a reliable process and structure to help them understand what spaces to use as starting points.

This matrix could be used with any design method because it identifies design spaces and forming design ideas, which are characteristic of all types of projects. The matrix does not interfere with the actual design process and also is not limited to HCD. When designers decide on what they want to develop, they can move forward with any method or tool they find appropriate for their specific project.

Pairing individuals' grounded needs with four grounded activities, this matrix helped emerging design researchers systematically organize design explorations. As I presented in this chapter, the matrix shows different designs as function of team activities and to what degree designers can benefit from the matrix. In Chapter 7, I further discuss the contributions and significance of the matrix, and I provide an example of another theory in the design matrix. I also discuss directions for future research and additional ways to bridge the gap between design practitioners and scholars.

## Chapter 7 - Conclusion, contributions, and future directions

This dissertation was motivated by scholars' calls to bridge the gap between scholarly research and interaction design practice. Rogers (2004) argues that, "we need to consider the direction and role that theory should take in the field of HCI and the practice of interaction design" and that "a better exposition of how theory can be used in both research and design is needed" (p. 131).

Schön (1983), in his seminal book, *The Reflective Practitioner: How Professionals Think in Action*, highlights the divide between scholars and practitioners, and indicates, "We are in need of inquiry into the epistemology of practice. What is the kind of knowing in which competent practitioners engage? [...] In what sense, if any, is there intellectual rigor in professional practice?" (p. viii). Schön notes how much of the design process happens orally and how practitioners' knowledge is mostly tacit and indescribable, such that when practitioners attempt to describe their knowledge, it "paralyzes" them. This tacit knowledge of design practitioners "spreads informally" in verbal critiques, discussions, or design competitions, which as a result, "prevents designers from extending each other's work and from building a collection of shared discoveries" (Zimmerman et al., 2005). Schön argues that practitioners' inability to talk explicitly about what they know leads to problems of justifying their work's rigor and ultimately leads to an uncertainty, which can be viewed as a sign of weakness. Schön calls for more work to help understand the relationship between the type of knowledge honored in academia and that is valued in professional practice.

In response to these calls, I undertook a three-step approach to examine the role that scholarly research and theory can play in guiding interaction design. I chose solo travel as a novel and interesting domain for this exploration because it captures a wide range of fundamental human needs, such as self-actualization, self-esteem, and reflection that are less prominent in other contexts and are rarely explored in design communities. Extensive interviews were conducted with solo travelers to learn about how they used technology and the types of travel activities they participated in.

In **design project 1**, I addressed the first research question, *What role can research data on phenomenological experience play in guiding interaction design in the domain of solo travel?* This project featured a thematic analysis in an attempt to design interactive technology for solo travelers through two perspectives: (a) solo travelers' sociotechnical practices and needs, (b) solo travelers' activities. Design project 1 findings were twofold; (a) a description of sociotechnical practices of solo travelers and their relationship to technology through four inductively generated themes, and (b) an activity-based framework that identifies types of common solo travel activities.

These findings guided interaction design in two main ways: (1) the activity framework helped focus design ideas on specific activities (preparation, exploration, acclimation, reflection), and (2) the four themes helped tie the design ideas to interview data.

Using these findings, I generated two design ideas: Travel Sidekick and Reflector, and described how their features connect to research. I noted that the limitations of employing this approach are (1) a lack of research skills among design practitioners, (2) the lengthy process of collecting and analyzing data, and (3) the process requires design practitioners to read scholarly work throughout the process.

The intriguing and subjective nature of solo travel coupled with limited literature in design-oriented communities, required further interpretation of the interview data. Therefore, in **design project 2**, I took a theoretical approach to answer the second research question, *What role can identity theories play in navigating between research data on phenomenological experience and interaction design in the domain of solo travel?* I selected three identity theories based on the patterns that I observed in design project 1 to help further interpret the data. The saturated self, the protean self, and the presentation of self theories helped me develop a theoretical sensitivity (Strauss & Corbin, 1990) that allowed me to be more empathetic with solo travelers. However, the three theories were not equal in their ability to connect research data with interaction design. The saturated self and the presentation of self theories focus on managing one's relationships and maintaining one's appearance in ways that applied well to today's contemporary lifestyle and social dynamics. However, inventing and reinventing one's self through the lens of the protean self proved too abstract and theoretical to apply to practice.

Structuring the data analysis on both theory and activity dimensions led to the development of the matrix as a new design process. The essence of this process is to use matrix intersections as a

way of identifying and exploring design possibilities. Design project 1 produced dimensions that would appear along matrix rows, and design project 2 produced the columns.

**In design project 3**, I undertook a Research through Design (RtD) approach and worked with 16 emerging designers to address the third research question: *How can human motivation theory help navigate between phenomenological experience and interaction design in the domain of solo travel?* The designers coded a selected set of the interview data looking for solo travelers' needs. After coding, creating affinity diagrams, and analyzing the data, the emerging designers interpreted the solo travelers' needs from a different perspective than I did in design project 1. This difference in perspective, which was an act of an Interpretivist approach, led to the emergence of themes that matched Maslow's hierarchy of needs.

The designers then used the matrix to pair Maslow's eight grounded needs with the four grounded activities produced in design project 1. The matrix helped the designers systematically organize their design ideas. It introduced a new way of thinking about how designers systematically explore a design space in the context of solo travel.

As the design project 3 iterations suggest, the matrix could potentially be customizable in bringing in other theories. Here, I refined the matrix to include dimensions of a single theory, which deviates from my original three-theory composition. I recognize that the three theories are not the dimensions of the same theory, and they interpret identity differently in their respective domains. But I used this analogy to refine the matrix and dive deeper into a single theoretical perspective.

Chapters 4, 5, and 6 refine how this matrix might work. I began with a grounded approach and then proceeded to a natural application of theory. The last stage, presented in Chapter 6, illustrates how the matrix can be effectively used to deeply explore the dimensions of a single theoretical perspective (Maslow's hierarchy of needs). Design project 3 demonstrated that the matrix can be an effective tool to help designers structure design conversations around sections of theory and practice. The matrix supports the design process in three main ways: (1) it helps discover design spaces that have not previously been identified, (2) it helps direct focus to interesting and provocative design spaces, and (3) it helps organically form design teams with shared interests.

Existing design approaches do not guide design practitioners with the intentionality and the formalisms that my matrix provides. The matrix's formal organizing structure serves as a way for designers to connect theory with their design process.

In this dissertation, I discuss three ways of validating the matrix. First, I provided a *proof of concept* through utilizing the matrix in design project 3, where I illustrated that the matrix helped the 16 emerging designers generate new design ideas. I presented how different designs were a function of different team activities. The independence of the design groups in utilizing the matrix is a validation of the matrix. Second, I provide a *theoretical* validation of the matrix in the next section (spotlight on matrix) where I use Davis and Sumara's (2006) theory to explain how the matrix helped the emerging designers, both as individuals and as a collective, to collaborate and generate new design ideas. Third, I offer (later in this chapter) additional validation by engaging in a form of cognitive walk-through by demonstrating the utility of the matrix in generating new design ideas by replacing the Maslow's theory with (a) Schwartz' theory of human basic values (2012), and (b) the inductively generated sociotechnical themes (in design project 1). Finally, I discuss the opportunities for future *empirical* validation of the matrix.

### **Spotlight on matrix**

The most exciting and useful outcome of this research has been the development of the matrix as a design tool. Here, I briefly theorize why this might be the case and demonstrate how the matrix can be used with other theories or domains as possible directions for future research. I will also use quotes from six of the designers (D1, D3, D6, D7, D14, D16) in design project 3 who reflected on their experience of using the matrix. Writing reflections on the matrix or the design project was not required, though encouraged, in design project 3 and these designers chose to do so themselves.

As described in Chapter 6, the 11-week design activity began by asking designers to sketch ideas for solo travelers. More than half of these resulting designs focused on safety, while the rest were concerned with finding friends and entertaining a solo individual. However, the matrix offered designers new ideas and interestingly, none of them selected safety as their design theme because they perceived it as "boring" and generic.

**Confidence in professional knowledge.** When I asked designers about their rationale behind their design ideas, they were unable to articulate reasons; some named TV shows or said that the

ideas were based on intuition. Schön describes this difficulty to externalize rationales as a threat and a sign of weakness where the design practitioners cannot justify their design quality or rigor. However, after utilizing the matrix, designers could confidently discuss their design ideas, tie them to the interview data by using quotes, draw on Maslow's dimensions, and also talk specifically about the activities that their designs fulfilled. The matrix gave designers the language to comfortably discuss their design ideas, and power to defend their rationale. D1, a male pre-Engineering sophomore, wrote,

“Using Maslow's hierarchy of needs as a dimension is useful in determining what need should be designed for. [...] The dimension of the domain of the solo traveler (preparation, acclimatization, exploration, and reflection) was nice because it made me think about the time frame of the user group. It made me think of scenarios in which I would have Maslow's needs.”

For D1 using the dimensions from Maslow's theory and the activity framework was pivotal in organizing and directing his design ideas. In addition, being able to focus on specific intersections of theory and activity helped him and his team to generate design ideas that would address solo travelers' certain needs. He added,

“[...] we had a challenge to overcome, how do we design something for a group of people who have a need but we can't pinpoint it? The answer lay in narrowing the matrix data to a solo traveler activity such as hiking or camping. Once we did that our ideas became much more concrete.”

In this quote D1 refers to his team's challenge of discovering solo travelers' foundational needs because solo travelers often did not explicitly about their needs.

**Design as a reflective conversation.** The matrix provided the structure and the vocabulary to precisely communicate design ideas and rationale. This feature of the matrix provides internal clarity and helps both collective and individual designers. The ability to externalize design ideas and communicate them with others, especially in written format, addresses Schön's comments that when designers “have achieved congruence of meaning, their dialogue tends to become elliptical and inscrutable to outsiders” (p. 80). As described in design project 3, the designers were able to engage in dialogue and explicitly describe their design rationale and process, and each group created a document that served as a source of knowledge to other designers or researchers. Schön argues that drawing and talking are parallel ways of designing, and together

they make up the language of designing. We experienced this “language of design” during the first session when the designers needed to point to their sketches to be able to talk about their design ideas. At the end of the design project, they had a document that explained every feature in their designs and the rationale for it as well as every step taken in the design process. D3, a male undergraduate senior who joined the group in his final quarter, listed the benefits of using the matrix as follows,

“The layout of the matrix immediately offers the number of possible design spaces, which is very clear and helpful. [...] One dimension contains components in an existing theory, while the other involves the categorized and summarized user research results, which makes this framework a perfect combination of theories and practical results.”

For him (D3), connecting design ideas to theory and the activity groups (he refers to them as practical results) provided a language and a structure that guided him throughout the design process. He reflected on specific intersections on the matrix and wrote,

“Although some of them [intersections of theory and activity] do not make sense, getting exposed to those design spaces are mind-stretching, and sparks new ideas on other design spaces.”

The matrix helped him (D3) to not only generate specific design ideas on what his team had selected, but also to stretch his thinking beyond obvious design ideas – such as the possible designs at the intersection of physiological needs and reflection activities.

**Randomness.** According to Davis and Sumara (2006), randomness refers to the conditions that “compel the collective to constantly adjust and adapt” (p. 147) and applies to groups of agents. In design project 3, we experienced randomness when the designers were free and spontaneous in their exploration of design spaces, which allowed them to not be constrained to only a subset of the design space.

While the designers had the freedom to generate any design ideas they desired on the first session, they discussed initial difficulties coming up with ideas on the final reflections. D7, a male undergraduate senior who joined the project in his final quarter, wrote,

“[...] solo traveling is such a broad activity in itself. I did not really know where to start designing because there were so many activities and phases of solo traveling, and so many parts of the human experience to try and explore.”

He found the solo travel domain to be too broad and having guidance on a clear starting point was useful. D6, a female pre-Engineering sophomore, talked about her prior experience in other design charrettes that also started proposing design ideas without having conversations about the rationales behind the ideas. She (D6) wrote,

“[...] from past experience in a charette, people were immediately throwing out design solutions. I was originally shocked because before this charrette I never thought of designing particularly for an experience for solo travelers.”

These emerging designers experienced randomness in design charrettes and the challenges of coming up with a new idea in an unfamiliar domain. As a consequence, their initial ideas appeared random and were not grounded in any relevant data. Upon closer examination, none of the initial design ideas were specifically for solo travelers but were instead for all types of travelers. While this could be positive, it suggests the limits of imagination and lack of specificity when ideas are not supported by domain knowledge or a theoretical construct. But using the matrix resulted in five design ideas that all had solo travelers' needs in mind, and could be extended to other types of travelers or even non-travelers. For example, people who hike in groups or people with disabilities can use the hiking pole, and Journey can be used in everyday life to capture special moments and to be grateful. This design exploration was an example of designing for a niche population that could transcend to others, starting with an eclectic group of solo travelers that extended outward.

**Coherence.** Coherence refers to conditions that would “allow a collective to maintain a focus of purpose/identity and sources of disruption” (p. 147) and similar to randomness, it applies to a collective. Other designers also expressed feelings of relief when the matrix was introduced as a tool, especially because it allowed them to have ongoing conversations that weren't previously possible. The matrix provided a *coherence* that allowed the designers to engage in a dialogue about their various ideas, to narrow them down, and ultimately arrive at a consensus.

The designers reflected on their experience of using the matrix and D7, a male undergraduate senior, wrote,

“When we were introduced to the matrix, it was a big relief. By doing the matrix, we were able to frame and narrow solo traveling and human needs down to general, yet essential categories (self-actualization, exploration, esteem, etc.). From that point, I think it helped us be a lot more decisive throughout the whole

process. [...] all of our design decisions and rationales behind them were all connected to the matrix itself. We would have very lengthy and intricate discussion on the topic of solo traveling.”

This designer pointed out another important feature of the matrix—narrowing down the design spaces. This is important because technically, the matrix enabled the designers to generate more design ideas than they initially had and then narrow their focus. By utilizing the matrix, they purposefully and systematically generated and selected their design spaces without feeling overwhelmed. In other words, the matrix helped them explore new ideas with a sense of control.

**Balancing randomness and coherence.** The matrix helped balance randomness and coherence, which according to Davis and Sumara (2006), is one of the three conditions that facilitates emergence of knowledge. A quote from D6, a female pre-Engineering sophomore, nicely captures the balancing between randomness and coherence:

“I enjoyed the matrix because it gave me the opportunity to brainstorm ideas and prototypes in my head, before selecting which cross-sections I wanted to research on. The matrix helped narrow down ideas, but it also helped broaden my thinking and focus into one intersection. [...] I thought it was interesting to randomly select topics.”

Similarly, D3, a male undergraduate senior appreciated how the matrix allowed him to be focused while being able to come up with more design ideas. He wrote,

“One can think both vertically and horizontally on the matrix, which has the potential to get more inspirations”.

When this designers talks about having opportunities to brainstorm, selecting cross-sections, and narrowing down their design spaces, she is referring to coherence; and when she talks about broadening thinking and randomly selecting topics, those are references to randomness.

In design project 3, each group knew they were operating at the intersection of Maslow principles and the four activities. After selecting their design spaces, the designers could explicitly discuss their ideas and differentiate them from other teams’ projects. This provided coherence because everyone’s work was articulated in reference to the matrix. A key aspect of coherence is to provide structure while allowing some degree of randomness. The matrix retained plenty of randomness by directing the designers’ attention to 32 potential design spaces,

which gave the designers agency to work on an interesting topic with a group of designers who shared that interest.

**Collective action.** Randomness and coherence are important factors in collaborative projects. The designers expressed their anxiety and uncertainty about how they would form separate groups. D6, a female pre-Engineering sophomore, had expressed concerns about the group formation on the second week. In her reflections, she wrote,

“When we were given the matrix, I was alleviated because in the beginning I wasn’t sure how we would divide into groups, and how we would get topics.”

The following quote from D3, a male undergraduate senior, also nicely captures this feature of matrix.

“Like the individual brainstorming, a group of people can collectively focus on a specific dimension (by looking at the matrix horizontally or vertically) and hold conversations about it.”

Other designers made similar points from the first session, asking me about how the teams would be formed. This concern was so prevalent that some of the designers even inquired about team formation in their applications to design project 3. D7, a male senior undergraduate who joined the project in his final quarter, expressed his feelings about using the matrix to form the groups and said,

“[The matrix] made forming teams more effective. I thought it was a clever idea to organize teams based on who had similar combinations within the matrix. I got paired with really great group members who were enthusiastic and diligent in exploring the same area of interest.”

Maintaining “a delicate balance between sufficient coherence to orient agents’ actions and sufficient randomness to allow for flexible and varied responses” is an important factor to ensure “everyone participates in a joint project” (Davis & Sumara, 2006, p. 149). The matrix created enough randomness by enabling the designers to think broadly and then adjust and adapt to the changes throughout the project while working with the team members. The matrix also created enough coherence that allowed them to maintain a focus and appreciate the randomness. As a result of having enough randomness and coherence, the designers felt that they were all participating in a ‘joint project’ and they could have a dialogue in their team and

with other teams, though their projects were different. D6, a female pre-Engineering sophomore, wrote,

“I felt that if we didn’t have the matrix, there would be chaotic thinking.”

Randomness without coherence would cause chaos, as we saw in the first design session where the ideas were random but not coherent. Coherence without randomness creates boredom, like the initial design ideas about safety. In the design ideas proposed in the first session, there was a lot of randomness but no coherence, at least not discernible by the group, and so it was hard to know what next step to take as a group to move forward toward design while working on our shared goal of creating knowledge through the RtD approach.

**Neighbor interactions.** Davis and Sumara (2006) argue that having coherence and randomness together create “neighbor interactions” where designers interact with each other to share “ideas, hunches, queries, and other manners of representation” (p. 40). Here, that matrix facilitates neighbor interactions between design ideas and particular directions of design processes by identifying novel intersections.

Davis and Sumara reinforce that neighbor interactions works when mechanisms are in place “to ensure that ideas will stumble across one another” (p. 41). The matrix provided a mechanism that supported the designers’ interests and grouped them based on their interests. The designers brainstormed their ideas within their respective groups, and interacted with other teams in design charrettes by giving them feedback, asking questions, or having discussions. D7, a male HCDE senior undergraduate who joined the project in his final quarter wrote,

“[The matrix] also made us a lot more thorough and considerate of how each design choice we made is isolated to a specific category in the matrix. Therefore, I believe that the true reward that came out of this was a highly cohesive and insightful process that could benefit others who are attempting to explore similar design spaces in the future.”

Through neighbor interactions, the matrix identified 32 potential design spaces, which were only made possible by mapping the dimensions into a shared, inter-related design space. These neighbor interactions can determine whether a chaotic system could survive and succeed.

In neighbor interactions, the agents influence each other, as we saw in design project 3, and as a result, the group's emerged knowledge was greater than the sum of the individuals when we started the project.

**Decentralized control.** Davis and Sumara point out the importance of having a mechanism that would enable the agents to “relinquish any desire to control the structure and outcome of the collective” (p. 144). The matrix's unique conceptual and organizational structures were able to decentralize control of design project 3 in two ways.

First, the matrix did not require a dominant influence (e.g., supervisor, design lead, etc.) to be present. I introduced the matrix to designers because it was my creation, and they were not familiar with it, but from that point, the designers were free to explore the design space on their own. By giving all designers a design “map,” they were equally empowered to explore the design space. Thus, the matrix removed the need for a leader and democratized the design activity.

If only one person had the map, whether a supervisor or one of the designers, then that individual would have a power advantage over the rest of the team. Alternatively, if there were no matrix, the designers would flounder around without awareness of where they were in the design space, experiencing an unguided, blind exploration of design space. They might come up with new ideas, but they likely wouldn't be able to articulate the relationship between these ideas. Thus, the matrix empowered the designers by providing them with a guide. In that way, the matrix is intrinsically freeing, providing equal access to information and, thus, power.

The second way that the matrix decentralized control was within each group of designers. The teams were not formed based on skillsets or experience, but rather the matrix allowed for team formation based on shared interests. No team member had power over others, as the matrix did not create hierarchy. The matrix let the designers self-organize in their respective teams to develop their own interpretive possibilities through team discussions. It also streamlined collaboration and designers' direction to refine their ideas and move toward a shared goal. This way, the designers in each team saw themselves as equals. Thus, the matrix supported decentralization of control within the teams, as well. As Davis and Sumara indicate, “control in a knowledge-producing collective must be understood as decentralized, arising in localized activities” (p. 144). D16 reflected on her collaboration with D13 and D14 and wrote,

“Throughout my time with this team, I was constantly appreciative of our approaches to tackling the design space. We worked well as a team because we all helped balance each other out – D13 was the enthusiastic whiteboard artist, D14 was the passionate, but strong-opinioned idea generator, and I was the sense of reason and the group member that could take the mess we’d made with our ideas and bring them back down to something more organized and understandable.”

Her (D16) quote highlights that there was no sense of hierarchy in the team and they were all equally empowered to voice their opinions and being heard without being authoritative.

It is important to highlight that the matrix’s democratization is not an intrinsic feature of the matrix, but rather of the way it is employed. The matrix, itself, is neutral. It only tells designers where they are and what is available to them. But, it is the interaction between the matrix and the way it is employed that makes the matrix a tool that can decentralize control. Metaphorically, one can give you a map (matrix) and dictate where you should go, or can give you a map and give you the freedom to explore as you wish. So there is no intrinsic tendency for the matrix to lean toward decentralization of control.

According to Davis and Sumara, decentralizing control and relinquishing the desire to control the structure and outcome of the collective is an important condition to support the emergence of knowledge and to ensure collaboration is innovative. Adopting RtD reinforced our goal as a group to produce knowledge and “not interpersonal collectivity, but collective knowing” (p. 145). D7, a male senior undergraduate, reflected on how the matrix helped his team and wrote,

“I would very much considering using this kind of matrix in other design projects. It helps designers and researchers become more focused and have a more clear reason as to why they make a particular decision. It is also a good team building activity that can help generate a lot of interesting and beneficial discussions.”

His (D7) remarks highlights how the matrix gave them a way to remain focused on their design purpose and generate ideas and have useful discussion.

**Liberating constraints.** As mentioned earlier, the matrix allowed randomness while gave the designers a sense of control. This is important because while many processes are too

constraining and therefore make the design process very mechanistic, the matrix did not dictate what would come out of the design process. The matrix provided constraints that were desired and appealing because while it directed the designers to focus at each intersection as a design space to think deeply about the possible designs there, there were no restrictions in where imagination could take them. This was especially possible because each of the four travel activities was coherently and deliberately broad, while at the same time, grounded in the data. For example, exploration could include photography, hiking, wandering around, meeting people, sightseeing, and other activities. The constraints imposed by the matrix were also desirable. D3, a male undergraduate senior listed several desired benefits of using the matrix in a bullet point format and wrote,

“[The matrix] is desirable because setting up the matrix does not require too much work. It is desirable because the matrix will exhaustively include all possible design spaces, hence will create an efficient start. It is desirable because it can be used under both individual and team settings. It helps individual see all the possible design spaces, and helps team forming as well.”

Also, as the earlier quotes show, the designers were relieved when we used the matrix to put them into groups. An interesting quote from D6, a female pre-Engineering sophomore, was,

“[...] by placing us into groups, we were allowed to restrictively think chaotically within our subject of research.”

What this designer expressed as “restrictively think chaotically,” Davis (2004) calls liberating constraints, which are “guidelines and limitations for the activity that are intended to provide enough organization” to orient a collective action while “allowing sufficient openness for expressions of the varieties of experience, ability, and interest representing in any social grouping.” Liberating constraints “serve as common experiences and a basis for a common vocabulary while allowing learners to adapt their activities to their specific interests and understandings” (Davis, 2004, p. 169).

**Balancing diversity and redundancy.** The designers came from diverse academic backgrounds, such as psychology, history of science, art, management, information science, and the majority of them were from engineering. Grouping individuals from such diverse backgrounds is always challenging, and as some of the quotes above showed, it introduced

anxiety to some of the designers. Davis (2004) refers to this as “living the tension between diversity and redundancy,” which are conditions of a collective work (p. 136). Redundancy refers to the similarities between groups of people who come together to work on a project. It highlights the importance of having some redundancies in the group to be able to collaborate in a meaningful way in order to generate something new. In design project 3, all the individuals had design skills and were working toward becoming professional design practitioners and design researchers. A basic tenet in diversity, as Davis (among other scholars) argues, is that it is a source of “possible responses to emergent circumstances” (p. 143) that can arise from the interactions of a network of researchers with skills in such diverse domains mentioned above.

The matrix played an important role in balancing the tension in a diverse, yet redundant, group by helping them work in smaller teams that shared the same interests. Designers appreciated the flexibility in choosing their design space and their teams based on their interests and shared goals. D14, a male HCDE undergraduate junior, reflected on his collaboration in a diverse team with (D13 and D16) and wrote,

“Being the person with a certain philosophy background, I was the main literature researcher of the team. [...] Being the person with experience in tackling complex and abstract thoughts, I took the initiatives and led every team discussion. [...] Overall, D13 was the strong-opinionated brainstormer and D16 was a great communicator who can communicate in clear language, and I am glad that I had the pleasure to work with them.”

As he (D14) stated, the matrix facilitated another precondition of knowledge creation by helping to balance redundancy and diversity, such that designers could collaborate while also bringing new design solutions to the table.

**Emergence of knowledge.** Davis and Sumara (2006) identify three principles that lead to the production of knowledge (Turns, 2011): (1) embrace and balance the tension between diversity and redundancy, (2) provide liberating constraints by balancing coherence and randomness, and (3) promote trans-level learning through neighbor interactions and decentralized control. As discussed above, the matrix helped 16 diverse designers to work together in groups of 3-4 to solve specific design problems. The matrix helped balance diversity and redundancy by giving the designers agency to select their design space and teammates based on shared interests. It then helped a diverse team effortlessly work together. D1, a male pre-Engineering sophomore, wrote,

“One thing that interested me was why did my group members choose esteem? I’m not entirely sure why they all chose esteem to be honest. I thought that the group worked well because everyone had a common interest in esteem, and I thought it was neat how different groups worked on different needs.”

His remarks suggest the smooth process of forming the teams. In other words, when designers got together as a team, they united around a shared design vision and thus individual differences did not preclude their ability to collaborate as a team.

The matrix provided another condition for knowledge creation by balancing between randomness and coherence by allowing designers to explore new ideas with a sense of control. The matrix enabled them to feel liberated within the constraints of the matrix as it highlighted 32 design spaces. Some of the design spaces were less obvious, such as the intersection of physiological needs and reflection activities, while others were obvious, such as the intersection of safety needs and exploration activities. While it is generally hard for different projects to be in dialogue with each other, the designers could see the connection between all the designs because they all originated from the same matrix of theory and travel activities.

The matrix also gave the designers agency to form teams, chose their design spaces, and refine these designs through frequent interaction with their teams and ultimately, communicate their designs with other teams. The designers defined and determined their directions through team discussions, as opposed to a framework that I introduced; this decentralized control facilitated team learning. As D7, a male HCDE undergraduate senior, wrote,

“We would have very lengthy and intricate discussion [...]. Sometimes, we would even feel lost as to what we are really trying to design for.”

Interacting with team members and having long discussions brought more clarity and focus to the projects. D7, a male HCDE undergraduate senior, wrote,

“This was a highly cohesive and insightful process that could benefit others who are attempting to explore similar design spaces in the future.”

The three principles listed here to promote the emergence of knowledge, are also argued to help predict or understand when a group working together would generate something new (Turns, 2011).

I draw on theories from education here because they share similarities with interaction design. In addition to the issues they encounter when borrowing theories from other disciplines (discussed in Chapter 5), both fields are fairly dispersed and transdisciplinary (Rogers, 2004; Davis, 2004). Interaction design sits at the intersection of many areas of inquiry and must simultaneously incorporate various phenomena and issues into effective practices. Due to the transdisciplinary nature of interaction design, the matrix can potentially be a powerful means to pull together disciplines and discourses while enabling researchers and practitioners to address the practical applications of interaction design.

Another significant feature of the matrix, in addition to the features mentioned above, is that as described in chapter 6, the dimensions from Maslow's theory emerged as a result of the designers coding the interview data. By coding the interview data, the creation of the matrix developed into a participatory activity that gave the designers a sense of ownership and agency. Having their part to play in making connections to Maslow's theory, rather than being passive recipients who have the theory given to them, likely made them much more engaged and interested in adopting the matrix in the design process. Earlier in this dissertation, I introduced Yvonne Rogers' concern about designers being positioned as recipients of knowledge rather than creators of knowledge. This vignette about the designers making the connections to Maslow illustrates what it might look like to help designers participate in the creation of knowledge.

Reflecting on the challenges of connecting design practitioners and researchers that I discussed in Chapter 2, the matrix can potentially facilitate the collaboration between the two groups. While researchers are experts in conducting literature reviews, analyzing data, and generating required thematic dimensions for a design project, designers can use these research findings to discover new design spaces and gain a better understanding of the domain for which they design. As discussed in design project 3, designers can benefit from staying up-to-date with academic literature and sharpen their understanding of the design field using theory. But because designers and researchers do not use the same language to present their work, the matrix could potentially help package and present ideas and findings in a mutually understandable format. Currently, larger design firms, such as IDEO and Frog, involve a diverse group of practitioners and researchers in their projects, and it is not unusual to see an ethnographer, a psychologist, or a sociologist collaborating with designers on a complex design problem. However, other

companies have not been very successful in having designers work with doctorates from social science disciplines. This matrix can help foster these types of collaborations by guiding and organizing their efforts in a meaningful way that is understandable to both groups.

As a final point, when the designers presented their ideas to the solo travelers during the final week of the project, they did not talk about the matrix, the theory, or the travel activities in order to justify their design quality or rigor. To the audience, who were not aware of the design process and the behind the scenes interaction, the designs seemed random, innovative, and interesting. The solo travelers asked the designers to let them know when they develop their designs and encouraged the designers to consider a Kickstarter campaign. Solo travelers felt they could relate to the designs and ranked the designs highly in terms of their importance and relevance to solo travelers. (See Appendix K for feedback forms)

### **Future Directions - Adapting the Matrix**

In this dissertation, I implemented Human-Centered Design, which is a needs-based approach. An emerging question that arose out of my findings was whether Maslow's theory of human motivation helped design for solo travelers because it covers the entire range of human needs, making it perfectly aligned with HCD principles? Or could the matrix work equally as well with other theories? And similarly, if Maslow's hierarchy is retained in the matrix, can it be used to explore domains other than solo travel?

These two questions prompted broader inquiry into whether the matrix is reproducible. Could the matrix reveal other interesting insights when applied to different domains and theories? One hypothesis is that to reproduce the matrix, designers will have to explore their domain and determine appropriate dimensions—which is inherent in HCD (Earthy, Jones, & Bevan, 2001). For the theoretical dimension, designers would need to select a relevant theory that they find by reviewing the literature.

In order to reproduce this model, designers will need to complete two steps: (1) they need to have a good understanding of the domain in order to generate relevant dimensions, and (2) they will need to find or generate the columns using a theoretical perspective.

This hypothesis leads to more questions. For example, what theory do designers pick, and how do they pick a theory? In design project 3, designers did not initially choose a theory, but one

instead emerged after a few rounds of coding the interview data. Because Maslow's hierarchy of needs is a classic theory in psychology, its connection to the emerged themes during coding was rather obvious. However, creating such connections between data patterns and a relevant theory might not be always as straightforward—especially for design practitioners.

In addition, if designers choose another theoretical framework, would it lead to the discovery of new design opportunities? This is important because in my research, incorporating theory at the early stages of design proved to be helpful in guiding the design efforts and helping designers look at the design space from various different perspectives, and not only relying on data, but also grappling with the theory throughout the process.

At this point, the matrix's boundary conditions are still unclear, but these questions provide an interesting way to further advance its applications. In the next section, I offer some answers to these questions. My goal is not to demonstrate the success of the matrix in mapping other theoretical perspectives, but rather to illustrate the possibility of making the dimensions interchangeable.

### **An attempt to reproduce the matrix**

Because my study's domain is fixed, my first adaptation kept the rows the same and attempted to replace Maslow's human motivation theory. In my search of the literature for research that uses theory in design, I came across an article that used Schwartz's (2012) theory of human basic values. Hsieh and Kocielnik (2016) built on this theory for the purpose of informing the design of effective incentives. I selected this theory because (a) it discusses human values, which was a theme that came up during my open coding process when solo travelers talked about revisiting their values and reflecting on what is important in life, and (b) the authors use the theory to inform designers, and it was published in a design-related community, so it is relevant to the design community. In addition, the authors list three reasons for selecting Schwartz's theory that were also applicable to my study domain: (1) the theory focuses on individuals rather than cultures, (2) the theory includes values from various domains, and (3) the theory has been tested and broadly studied. The authors visualize Schwartz theory's ten basic human values and show how it correlate to five higher levels. Matrix 6 is my attempt to illustrate how these values map to my domain dimensions:

	Openness to change		Self-enhancement		Conservation		Self-transcendence		Hedonism
	Self-direction	Stimulation	Achievement	Power	Conformity / tradition	Security	Benevolence	Universalism	
Preparation									
Acclimatization									
Exploration									
Reflection									

**Matrix 6** - Mapping Schwartz’s Basic human values theory to travel activities in solo travel domain

At the first glance, some dimensions seem very close to Maslow’s vocabulary, such as self-transcendence and security. In Schwartz’s theory, self-transcendence includes two aspects: universalism and benevolence, both concerning altruism and goodness.

I decided to focus on these two aspects of self-transcendence and searched the interview transcript excerpts for relevant quotes. For example, one of the solo travelers reflected on her trip to Africa and said,

“It was in Africa for sure. And I was thinking about like, working in public health, and global health, and, you know, I want to do this in the future, and I was thinking about that. And I just started thinking, like, is it really even worth it for me to do that? Like, is it ethical, and moral? And is it not just another form of like, colonialism, to go in and... I mean, I think that’s probably a pretty common critique of some global health organizations, or all of them, I don’t know... But I had never thought of that personally, for myself. And so that was a really insightful moment, to be critical of the work I want to do in the future, and- and figure out *my* ethics, a bit, and how I want to do about that.” P19

This quote is an example of altruistic and universalist thinking that was repeated by many of the solo travelers, especially when traveling through under-resourced areas. But the designers in

design project 3 did not uncover these quotes in their process, as described in Chapter 6. This difference may stem from three main reasons: (a) the differences in Maslow and Schwartz's definitions of self-transcendence, (b) in Schwartz theory, self-transcendence has a clear boundary as opposed to Maslow's broad definition that left room for interpretation, (c) Schwartz provides a way to operationalize self-transcendence through two sub-dimensions.

If one thinks about the kinds of designs that Schwartz's theory can generate based on the self-transcendence dimension, they may be more focused on philanthropy and humanitarianism, which differs significantly from the ideas my designers produced.

Self-enhancement is another high-level dimension in Schwartz's theory, and it encompasses power and achievement. Although self-enhancement may seem too abstract to find quotes or design for, its two sub-dimensions (power and achievement) are easier to understand and find examples throughout the interviews. In fact, solo travelers themselves used these two words.

The goal of this brief exercise was to see how other theories could map onto the matrix in the solo travel domain to initially examine whether the matrix is reproducible. And indeed, it is with this particular theory.

It is important to note that Maslow's theory of human motivation and Schwartz' theory of basic human values are similar in a few ways: (1) both are theories of human psychology, (2) both are focused on people's motivations, and (3) both theories include a set of dimensions as their building blocks. These similarities made the replacement smooth. However, as I described here, picking same dimensions can lead to different design ideas—despite similarities between the two theories.

This hypothetical exercise led to even more questions. What if the theory that we'd like to use is not broken down into its elements? For example, the identity theories I described in design project 2 did not include a set of features or building blocks that could be used as dimensions. Would the matrix still be useful in such cases? Should designers attempt to extract the dimensions of the theory themselves or should they simply discard that theory regardless of the potential perceived value? A quick search in the literature suggests that many theories talk about their building blocks, principles, facets, or manifestations, generated either by the creator of the theory or other scholars who have worked on that theory, but this is not always the case.

Another question is, that since learning about the domain is needed in any design project, can we replace the theory dimensions with the inductively generated themes? In this project, I

undertook a thematic analysis approach that could be turned into grounded theory if my goal was to create a theory. As a result, the four generated dimensions are thematic and could be potentially swapped with the theory dimensions. Matrix 7 illustrates what the mapping of the activities versus themes would look like.

	Technology as an undemanding travel companion	Revisiting social ties and norms	Balance between connectedness & not-connectedness	Desire for spontaneity & serendipity
Preparation				
Acclimatization				
Exploration				
Reflection				

**Matrix 7** - mapping sociotechnical themes and activities

The act of creating this matrix made me think about new ways to generate design ideas, irrespective of whether they are worth pursuing. I could not help but generate ideas about tools that could be useful in revisiting social ties and social norms while one engages in reflection, exploration, or acclimatization. It also triggered thoughts about designing tools that help travelers be more spontaneous. Similarly, designers can potentially swap the travel activities dimensions with other types of activities that would fit their domain.

Further studies can show whether the matrix is generalizable and reproducible or can help design in other domains by applying other theories, domain dimensions, or thematic dimensions.

Another area for future studies is to take another domain, such as health or education, and try to design interactive technologies using Maslow’s theory. This design exploration could be a step toward determining whether Maslow is ideally suited for HCD projects. A final question that emerged during this research was how do we come up with a generative theory that fits the data and domain? In response, I discussed two potential methodological variances:

- (1) An explicit set of grounded categories based on user activities. Grounded around travel and other theoretical perspectives (Maslow’s and Identity theories) that when matrixed, generate a design space that designers can explore. It is generative because it highlights a number of things that designers need to consider.

(2) An implicit one because my dissertation didn't show that one could use the matrix for any kinds of activity and whether the rows could be something that varies. In design project 3, I set it up such that the columns vary, but the rows could potentially vary too. Other researchers could apply this matrix to their own relevant domains. The dissertation doesn't show how matrix may work in other domains, but that is an interesting claim. The matrix provides exploration and has shown that generating these grounded categories helps yield important rows when they are matrixed with whole potential set of theories. Thus, the overarching claim is that there is now a method that can take descriptive theories that can be used as generative theory for the purpose of design.

### **Limitations of the Matrix**

It is very likely that not every theoretical perspective is going to fit. For example, it's unclear how to use theories that are not broken down into their building blocks or have a set of dimensions. In addition, because the rows in this model are activities, it is very likely that they cannot be mapped with theories that are focused on activities. For example, if I tried to use Hackman's (1968) three types of tasks (production, discussion, and problem solving), they likely wouldn't fit because they are also activities. However, they may work if I put them in rows and try to map them with Maslow's or the thematic dimensions in Chapter 3.

While this is an interesting manipulation of the matrix, it reveals how not all columns of theory are equivalent and only certain types of theories may apply. It may be possible to swap Maslow's dimensions with a theory that has a particular thematic approach. And if a theory has an activity-based approach, we could potentially swap rows for columns to create a design space, but that has yet to be tested.

Further studies are needed to prove the matrix's utility in other domains and with other theories. It is also not clear how it might be useful in specific design problems where the boundaries are set. But thus far, it seems to be a useful tool to explore new design spaces and generate new design ideas.

### **Other Future Directions**

There are several other opportunities for future directions, which I discuss some of them below.

**Future of work and nomadicity.** As discussed in Chapter 3, solo travelers' desire to prolong their travel time have led to creation of new models of earning income that fits into their travel plans. Many are changing their former structures of living to pursue their passion for travel. This change in travelers' lifestyle fits well within the revolutionary shift in work leadership environments that have been linked to the growth of social media and internet, and are associated with increasing desires for self-expression and personal growth. Scholarship in this area is blossoming, and there are even conferences, like Next: Economy about how the work of the future will be different from the work of today.

**Theory in Interaction Design.** In Chapter 2, I conducted a preliminary analysis to investigate how theory is utilized or discussed in the design of interactive technologies in HCI literature. I developed preliminary categories of my findings that helped me in this dissertation. However, a more systematic search in the literature to see how theory is used in interaction design and the types of theories routinely employed can shed light into better understanding the role of theory in HCI scholarship.

## **Summary of Contributions**

I use the categories introduced by Wobbrock and Kientz (2016) to summarize the contributions of this study. I also provide a brief description of each category below.

**1- Empirical research contributions.** According to Wobbrock and Kientz, empirical research contributions “provide new knowledge through findings based on observation and data gathering. Data may be qualitative or quantitative, aspiringly objective or unapologetically subjective, from the laboratory or from the field. In HCI, empirical contributions arise from a variety of sources, including experiments, user tests, field observations, interviews, surveys, focus groups, diaries, ethnographies, sensors, log files, and many others.” In this dissertation, the empirical research contributions are,

- a. An explanation of solo travelers' sociotechnical practices. (Design Project 1)
- b. A new conceptual framework to understand solo travel through activity perspective. (Design Project 1)
- c. An explanation of solo travel through three identity theories; protean self, saturated self, the presentation of self. (Design Project 2)

- d. An explanation of solo travel through Maslow's Human motivation theory. (Design Project 3)

**2- Artifact contributions.** The authors describe that while “empirical contributions arise from descriptive discovery-driven activities (science), artifact contributions arise from generative design-driven activities (invention). Artifacts, often prototypes, include new systems, architectures, tools, toolkits, techniques, sketches, mockups, and envisionments that reveal new possibilities, enable new explorations, facilitate new insights, or compel us to consider new possible futures. New knowledge is embedded in and manifested by artifacts and the supporting materials that describe them.” This dissertation's artifact contributions were presented as,

- a. Various designs based on empirical findings in design projects 1, 2, and 3.
- b. Design guidelines provided after each design process in design projects 1, 2, and 3.

**3. Methodological/Theoretical.** Wobbrock and Kientz indicate that “methodological research contributions create new knowledge that informs how we carry out our work. Such contributions may improve research or practice. They may influence how we do science or how we do design. They may improve how we discover things, measure things, analyze things, create things, or build things.” In addition, the authors state that theoretical research contributions “consist of new or improved concepts, definitions, models, principles, or frameworks. They are vehicles for thought.” The authors compare methodological contributions with theoretical contributions and add that while “methodological contributions inform how we do things, theoretical contributions inform what we do, why we do it, and what we expect from it.” The main contribution of this dissertation is a novel 2-dimensional analytical design process, embodied in a matrix, that theoretically and empirically maps design space. The matrix blurred the boundaries between methodological and theoretical contributions because while it is a design process that can inform how we do design, it also helps inform the design process, why we design this way, and what to expect from it if we use the matrix. However, the matrix does not predict or dictate the outcome of design. Since there is no category that fully captures the essence of the matrix, I included it in both categories. Further research might lead to more clarification on where does the matrix stand with regards to the Wobbrock and Kientz (2016) categories of research contribution in the field of HCI.

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# Appendices

## APPENDIX A

### PARTICIPANTS SCREENER SURVEY

1. Are you 20 years old or older?
  - a. Yes
  - b. No
2. What is your gender?
  - a. Female
  - b. Male
  - c. Other
  - d. Choose not to reply
3. Have you gone to a solo trip (a minimum of 3 days of travelling alone) on or after June 2009?
  - a. Yes
  - b. No
4. Are you planning on going to a solo trip by July 2015?
  - a. Yes
  - b. No
5. Would you be willing to participate in a phone/Skype or in-person interview regarding your solo travel experience?
  - a. Yes
    - i. If yes, please provide an email address that I can use to contact you.
  - b. No

## APPENDIX B

### PARTICIPANTS INTERVIEW PROTOCOL

There are two sets of questions in this document. First set will be used for people who are planning to go on a solo trip and second set will be used for travelers after they return. This interview guide is written to assist me in my proposed open interview process. The regular font texts are required questions and the *Italic* texts are there to help me exploring the topic further if needed. I am expecting my interviewees to have a variety of different travel experiences. Therefore, I designed the guideline to allow topical trajectories in the conversation that may stray from this guide when it seems appropriate. This will allow both the researcher and the interviewee the flexibility to go into details when needed.

#### **Introduction (~ 5min)**

- a. Introduce myself and the study
- b. Explain the purpose of the research
  - i. The goal of this study is to better understand how solo travelers go on a solo trip, and their use of digital tools and technology prior, during, and after trip. Also, to understand if/how solo travelers engage in reflective practices.
- c. Any questions about the consent form or procedure before starting the interview?
  - i. Ask permission to record the conversation.
  - ii. Remind them that they can stop interview at any time.

#### **Questions (60 - 90 min) – Pre travel**

1. Tell me about your upcoming solo travel.
2. Do you have any specific agenda for your trip?
3. How did you decide on going on a solo trip? / How did you find out about the [X] fellowship?
4. How do you think this trip will be different than your previous non-solo trips? – Especially if this is their first solo travel.

5. What are you expecting to get out of this trip?
6. What items are you taking with you? – Besides clothing
7. Why these tools?
8. Do you have any online presence? Facebook/Twitter/Blog/etc.
9. Are you planning to use social media?
10. Have you thought about sharing your experience publicly?
11. Are you planning on taking any photos? What kinds of photos? -Since there is not one to take your pic?
12. How are you preparing yourself for such trip? –Especially for fellowship group.
13. Do you have any concerns?

**Questions (60 – 90 min) – Post travel**

1. Tell me about your recent solo trip experience.
  - a. Why these cities/countries? [Singular or plural depending on the answer]
2. How did you decide on going on a solo trip?
3. How did you plan your trip? [look for information sources, process of gathering info, planning time]
4. What was your motivation to go solo?
5. What did you take with you? Why these tools [be specific about what tool depending on their answer]
6. How did you use these tools? [Name specific tools depending on their answer]
7. Were these tools useful?
  - a. What tools you wished you had not taken with you? Why?
  - b. What tools you wish you had taken with you? Why?
  - c. Have you thought of having a piece of technology to help you at a certain moment during your trip?

5. Did you take any photos? [Ask the follow-up questions if they already answered that above]
  - a. Have you gone back to review them since you are back?
  - b. Tell me about when you browse your photos. –What are the things you look for when browsing your photos?
  - c. How are you going to manage them?/have managed them?
  - d. If I asked you to share one of your photos with me, what would it be? Why?
6. Did you use Internet in your trip?
  - a. For what?
  - b. How did you use the Internet? e.g. Mobile/laptop/etc..
  - c. How did you have access to the Internet? e.g. Wi-Fi @ the hotel, coffee shops, etc.
7. Have you ever found yourself at a place/situation that you needed to be connected but there was no Internet connection?
  - a. What did you do?
  - b. Did it make any impacts on your experience?
  - c. Were you prepared for it?
8. Did any of your digital tools run out of battery?
  - a. What did you do? Can you give me an example?
  - b. How did it change your experience?
9. Have you met any new people?
  - a. Can you give me an example? Tell me about your experience.
10. Did you have any problems communicating with people? Tell me about your experience.
  - a. Have you used any translator/dictionary to help you? [Follow up if yes]
  - b. Have you considered using any apps to help with translation?

11. Did you get lost anywhere during your trip?
  - a. How did you find your way?
  - b. Did you learn anything from the experience?
  - c. Did it help you with the rest of your trip?
  - d. Did you consider using any map app/online direction?
12. Did you do any journaling? [If blogging, go to questions 13]
  - a. How did you journal? (Electronic or paper?)
  - b. What did you journal about?
  - c. What did you do with the journal?
  - d. What are you planning to do with the journal?
13. If blogging ...
  - a. Why do you blog?
  - b. Is it a public blog? [if positive, ask for the URL or follow up by email later]
  - c. Are you concerned about sharing the details of your trip with the public? Why or why not?
  - d. What did you blog about? Did you post pictures too?
14. Did you spend time thinking about your trip while traveling or after that?
  - a. About becoming confused or disoriented?
  - b. Related to any other things such as your photos, things you bought from those countries, memories, etc.?
15. Do you feel you have changed in any ways before and after your trip(s)?
  - a. In what ways?
  - b. Were you expecting this change?
16. Would you like to go on another solo trip if possible?
  - a. If positive, what would you do different than previous solo trip(s)?

b. If negative, why not?

17. Was your trip experience like you had expected it to be?

**Conclusion (~ 5min)**

1. Anything you'd like to talk about that I did not cover?
2. Ask if they are OK to contact them for follow up questions?

## APPENDIX C

### LIST OF TRAVEL BLOGS USED IN THIS STUDY

1. <https://chrisguillebeau.com>
2. <http://www.chasejarvis.com/blog>
3. <http://wanderingforgood.com>
4. <http://www.nomadicmatt.com>
5. <http://whereverthewindtakesme.com>
6. <http://www.seehearexplore.com>
7. <https://www.locationrebel.com/blog>
8. <http://www.alexinwanderland.com>
9. <http://annaeverywhere.com>
10. <http://breathedreamgo.com>
11. <http://www.camelsandchocolate.com>
12. <http://www.thisbatteredredsuitcase.com>
13. <http://www.unbravegirl.com>
14. <http://wanderlustandlipstick.com>
15. <http://www.whereisjenny.com>
16. <http://hippie-inheels.com>
17. <http://www.heartofavagabond.com>
18. <http://grrrltraveler.com>
19. <http://www.furtherbound.com>
20. <http://velvetescape.com>
21. <http://www.garfors.com>
22. <http://www.escapingabroad.com>

## APPENDIX D

### SAMPLE MEMOS

#### **Memo on sense of community (communication? collaboration?)**

Solo travelers use technology to connect to other travelers or locals. Social networking websites along with various travel forums and meet ups opened up new possibilities for solo travelers to interact with others on the road. These travelers connect quickly with other travelers and discuss the best places to meet, to hang out, to visit, or to eat. Usually, newcomers or less experienced travelers seek information from seasoned or experienced travelers and they are passionate to know about the latest news on the road. For example if there is an interesting gathering going on, a hike group to join, an event in town, and such.

Among participants in my study, using the Internet to connect to others was salient prior, during and after travel. For example, one participant said:

“... I made a random connection... Now I can't remember where I met this guy... I met somebody within a week or two before I left, who had been in- traveling in South East Asia. And then we stayed in communication via email; that was really interesting.... And there was a couple people who had previously traveled in South America, who I emailed a little at the beginning.”

This participant decided to use the Internet to connect and communicate with other travelers who have been to the countries she was interested in visiting. These communications helped her gather useful information and find answers to certain questions she had in mind about those places. Having access to those travelers via social media also helped her through reading their blogs and browsing their photos. This experience of learning about a new place through random other travelers was different than what one could learn by searching the internet in the sense that she could make her search more targeted and find the person who had the exact experience she was looking for as opposed to reading general travel blogs or guides which may not provide the level of details she was after.

Using online platform to meet other travelers and later using email to stay in touch with them helped this participant to not only find the answers to her questions, but also to turn the random and brief friendship, that could have only happened on road, into a more intentional, long term, and ongoing friendship – if desired. Connecting on social networks would allow them to follow each other and leave comments. For example, one of the participants said

“I friended this French guy I met in Lima and when I was in, umm, I did not like India at first, because, umm, I hated it. It was just ... it was just too much. so I saw his pictures [on Facebook]... and there was this picture of this holly, I guess, river I wanted to visit and yeah, so I thought he must be in this part of the world. I looked further and yeah, he was in Varanasi where the river is. I messaged him that hey I'd like to join.. and we met at this hostel ... we met some other people at the hostel, and we traveled for a few weeks in India together.”

In this example, online communication tools and solo travel offered this participant with a sense of cohesion and community. He had met the French traveler in another country accidentally over a brief hiking experience and they decided to connect on Facebook. This brief hiking experience resulted in an intense short-term friendship and reconnecting with him in India was a very pleasant experience that prolonged his travel time in India. Earlier in the interview he mentioned that he was about to leave India and reconnecting with this French traveler and meeting others in a hostel changed his itinerary.

Solo travelers tend to enjoy building an intense yet short friendship with other travelers. This kind of intensive communication network is the features of backpackers (Noy 2006), yet solo travelers would make a point to leave the group and go off on their own. Another participant said:

“ ... she was really intensely planning how we were going to rush through most of Central America and, another guy that we had met expressed interest in riding with us and I wasn't really interested in riding as a team of three ... so I said well what do you think about riding with [name] from now on? I kind of said, well I would like to ride solo and take my time and yeah she was accepting of this. What was it? It wasn't as sad I thought.”

In this example, the participant had met another biker and they rode together for about a week until they met another guy. Even though all three of them were heading the same direction, she decided to take part and ride solo. Many travelers frequently rush and want to sightsee as much as possible within the set time limits to get their money's worth, but for this participant the limits exposed by the two other travelers were perceived as external constraint that would negatively impact her trip.

Later in the interview she said that she saw both of these bikers at different places at different times and they shared a short ride together again. Travel offered her a great way to control and manage sociability, which is a relief from permanent residence. This offered here a great sense of freedom, which is a critical prerequisite to make leisure travel enjoyable (Iso-Ahola).

The balance between freedom and managed social distance seem to be an integral part of the solo travel experience. This is important considering that for these solo travelers, being on the road in and of itself means freedom. So, the ability to choose how and when to socialize was an added feature they appreciated very much.

Interactions with other travelers may range in degrees of intensity, intimacy and importance. Interactions could be brief or take several days or even weeks. Several factors could impact the interactions with others, for example if travelers have stimulating conversations, they might stay longer together as opposed to when there is a language barrier. Some more experienced travelers do not enjoy trivial conversations. One of the participants said:

“...in the beginning I was really jazzed to meet a lot of people and join a lot of groups and then after several years of the same sort of conversations like every conversation at a hostel starts the same way, how long have you been on the road? You know et cetera, et cetera. I started being a little bit more selective but that being said I do look forward to [meeting people] and if I get lonely and if I find myself being too introverted, I sort of make myself go to the common areas, that's why I stay at hostels because otherwise it's much harder to meet people as a solo traveler if you're at a hotel.”

For her, meeting and interacting with other travelers is still valuable and she does not enjoy feeling lonely, but she has become more selective about the types of conversations she has with others. This is a key difference between backpackers and solo travelers. Backpackers connect

quickly and share the trip whereas solo travelers tend to prefer travelling alone than with others if they do not truly enjoy the company and conversation. In other words, they would like to stay solo unless they meet people who they connect deeply with those and have interesting conversations.

Even though many solo travelers enjoy staying at hostels and meeting new people, they also use online tools such as Couchsurfing and AirBnB to help connect with other travelers as well as locals more closely and at a different level. Some of them use these tools at their hometown to meet other travelers and keep in touch with them via Internet and social media. For example a participant said:

“... other female travelers [suggested] that a really fantastic way to see some of these countries is to use Couchsurfing. And um... and she- she said, though, like, it's best to build up a profile before you leave, 'cause some people are not- they're not going to want to accept people with no references. So I was hosting people for the summer before I left, and one of the people I hosted had spent time in Peru and Honduras. And... so he was a resource for me when I was coming into that region.”

This participant seems to enjoy building a more permanent and long-term friendship with other travelers. Like the earlier examples, she is using the technology to meet new travelers and to stay in touch with them because she is thinking about meeting them again at some other places in the world and reconnecting in person.

## APPENDIX E

### EARLY CATEGORIES GENERATED THROUGH OPEN CODING

Several themes have emerged in this phase and they tend to shift as I read the literature and learn more about the topic. Some of the preliminary, high level themes and questions that emerged in this phase include:

*1- Technology dependency:* Participants talked about various uses of technologies. For example, technology as a source of information, technology as a communication tool, technology to capture and share the special moments of a trip, and technology as a means of making money. Participants were very particular about the devices they travel with, and had done extensive research to decide what devices would best suite their travel experience. Some travelers use the term “flashpacking” to highlight technology is key in their travels. In further analysis of my dataset, I may break this theme down to subthemes such as, technology for collaboration, technology specification, technology for communication, etc. A question that emerged is, without technological tether, would people still be travelling solo?

*2- Sense of community:* Participants took various approaches to meet new people including locals and other travelers. Using mobile apps to find other travelers nearby, Couchsurfing, meeting locals through online search for local events, or eating at local restaurants were amongst those strategies. This theme was very prominent and raised the question of whether we still consider these individuals as solo travelers considering their intension to meet others online or offline. This may suggest that sociotechnical developments have greatly changed solo travel’s core or traditional definition.

*3- Strong desire to stay nomadic:* All participants said they would like to travel more. Some of the participants came up with ways of extending their travels and others talked about their plans to become a nomad in the near future. For example, some participants said they’d like to work for a few years to save money and get back on the road, and others thought about starting an online business or getting a certificate to teach English to local people. This theme may also be broken down to subthemes such as motivations for being a nomad, barriers to/challenges of becoming a nomad, approaches taken towards being a nomad.

*4- Sense of familiarity and safety:* Even though most of the participants were new to the places they visited and many of them talked about their trips to remote, “exotic”, and non-English speaking places, having access to necessary information and staying connected to home gave them a sense of familiarity and safety. Some participants even used GPS trackers to let their family track them when they went off the beaten path where Internet access was not available for several days. Another question to think about is whether technological “safety net” would lead to taking more solo travels?

*5- Slowing down and Reflection:* Participants talked about reflection either explicitly or implicitly. Taking a journal (online or paper journal) to reflect on their trip, browsing through photos while reflecting on captured moments, and reflecting on comments left for their online posts were among the more salient reflection practices. How does reflection support solo travelers and can we support reflection by leveraging the tools solo travelers carry with them?

*6- Sense of self and Identity:* Participants talked about feeling free and brave, and enjoying the their independence while doing something different. They also talked about the joy of having control over their lives and actions, and the challenges they had to overcome alone. This sense of freedom led them to think about themselves as individuals, their achievements, their place in the world in relation to others, and to find inner peace.

## APPENDIX F

### SHENTON STRATEGY TO ENSURE TRUSTWORTHINESS IN QUALITATIVE RESEARCH PROJECTS

Provisions that may be Made by a Qualitative Researcher Wishing to Address Guba's Four Criteria for Trustworthiness

<i>Quality criterion</i>	<i>Possible provision made by researcher</i>
Credibility	Adoption of appropriate, well recognised research methods Development of early familiarity with culture of participating organisations Random sampling of individuals serving as informants Triangulation via use of different methods, different types of informants and different sites Tactics to help ensure honesty in informants Iterative questioning in data collection dialogues Negative case analysis Debriefing sessions between researcher and superiors Peer scrutiny of project Use of "reflective commentary" Description of background, qualifications and experience of the researcher Member checks of data collected and interpretations/theories formed Thick description of phenomenon under scrutiny Examination of previous research to frame findings
Transferability	Provision of background data to establish context of study and detailed description of phenomenon in question to allow comparisons to be made
Dependability	Employment of "overlapping methods" In-depth methodological description to allow study to be repeated
Confirmability	Triangulation to reduce effect of investigator bias Admission of researcher's beliefs and assumptions Recognition of shortcomings in study's methods and their potential effects In-depth methodological description to allow integrity of research results to be scrutinised Use of diagrams to demonstrate "audit trail"

## WALTHER ET AL.'S TYPOLOGY OF QUALITY STRATEGIES

		Making the Data		Handling the Data	
	Description	Focus	Example Strategies	Focus	Example Strategies
<b>Validation</b>	How can we improve the research findings' capacity to appropriately capture and represent aspects of the social reality observed?	Do we get to see what we think we see?		Is the researcher's version grounded in the versions of the participants? Do we call things by the right names?	
<b>Theoretical Validation</b>	Do the concepts and relationships of the theory appropriately correspond to the social reality under investigation?	The research process needs to be able to capture the full extent of the social reality studied.	<ul style="list-style-type: none"> <li>• Purposive Sampling</li> <li>• Emergent research design</li> </ul>	Interpretations need to reflect the coherence and complexity of the social reality under investigation.	<ul style="list-style-type: none"> <li>• Analytic Induction</li> <li>• Negative Case Analysis</li> </ul>
<b>Procedural Validation</b>	Which features of the research design improve the fit between reality and the theory generated?	Strategies need to be implemented in the research design to mitigate threats to contextual validation.	<ul style="list-style-type: none"> <li>• Critical Incident Techniques</li> <li>• Triangulation</li> </ul>	Processes need to be implemented to mitigate risks of mis-constructing the participants' reality in the researcher's interpretations.	<ul style="list-style-type: none"> <li>• Constant Comparative Method</li> <li>• Interpretive Awareness</li> </ul>
<b>Communicative Validation</b>	Is the knowledge socially constructed within the relevant communication community?	The data gathering needs to capture the respondents' inter-subjective reality.	<ul style="list-style-type: none"> <li>• Focus groups to establish genuine dialogue</li> <li>• Development of shared narratives</li> <li>• Exploring participants' contrasting accounts</li> <li>• Member Checks</li> </ul>	<p>The researcher's abstract interpretations need to be grounded in the accounts of the participants.</p> <p>The knowledge produced needs to be represented in accordance with the meaning conventions of the research community.</p>	<ul style="list-style-type: none"> <li>• In-vivo coding of first interpretations</li> <li>• Ongoing engagement with the data</li> <li>• Peer Debriefing</li> <li>• Relating theory to literature</li> <li>• Exposing knowledge claims to the discourse in the research community</li> </ul>
<b>Pragmatic Validation</b>	Do the concepts and knowledge claims withstand exposure to the reality investigated?	The concepts underlying the research design need to be compatible with reality in the field.	<ul style="list-style-type: none"> <li>• Diversity of respondents</li> <li>• Prolonged exposure to practice</li> </ul>	The knowledge produced needs to be meaningful in the social context under investigation.	<ul style="list-style-type: none"> <li>• Applicability Studies</li> <li>• Explanatory power of results</li> </ul>
<b>Process Reliability</b>	How can the research process be made as independent as possible from random influences?	The data needs to be collected and recorded in a dependable way.	<ul style="list-style-type: none"> <li>• Documented focus group protocol</li> <li>• Checking of transcripts</li> <li>• Training in research procedure</li> </ul>	Procedures for generating and representing knowledge need to be established and documented.	<ul style="list-style-type: none"> <li>• Standardized notes and memos</li> <li>• Procedures of cross-checking</li> <li>• Separating descriptive and interpretive coding</li> </ul>

# APPENDIX G

## SAMPLE PERSONAS

### SAMPLE PERSONA 1 - JAIME WHITE

Age: 32

Profession: Former Software Engineer at an enterprise

Family: Single and looking

Location: San Francisco, CA

Technology: Early adapter. She uses several gadgets and is very tech savvy.

Meet Jamie, a UW alumna of the CS department. She used to work full time for a big technology firm, but she quit her job after a few years because, like many of her counterparts, she felt overwhelmed with work and was not much in control of her life. Very often she worked long hours and did not get much sleep. She wanted to pause and think about what she wanted to with the rest of her life because working over 40hrs a week did not seem to sustainable for her.

Jamie loves traveling but being a dedicated student and a hardworking employee did not leave her much time to travel, so she did not know where to start. She decided to go online and read about places to visit and how to prepare for such trips. She found hundreds of travel blogs and forums as well as inspiring photos on social media that encouraged her to embark on her first trip.

Jamie is hesitant whether traveling would be a good idea because she does not have anyone to travel with. However, through online sources and conversations with people who she met at the meet ups or travel groups, she learned that she is not alone. She learned about solo travelers' communities, which appealed to her very much because for her, this was going to be a trip to help her find herself. She wants to have alone time to reflect on her life and think about the future while she wants to be in touch with other solo travelers to give her advice on the road and share part of the trip with them if she feels like doing so.

### SAMPLE PERSONA 2 – JOHN SMITH

Age: 27

Profession: Youtuber

Family: Girlfriend back home

Location: Seattle, WA

Technology: Tech savvy, iPhone, GoPro, Kindle, iPad

### **Goals**

- To share his adventure with others
- To get likes on Facebook and Instagram
- To feel strong a strong sense of accomplishment
- To create and share awesome experiences

### **Frustrations**

- Not being able to share pictures/videos with friends
- Possibility of camera equipment being stolen
- Having to use a selfies stick to take his own photos
- Not being able to achieve his personal goals while traveling

### **BIO**

Andrew is a young travel blogger, vlogger, and youtuber. He enjoys mountain biking, scuba diving, climbing, hiking, camping, and solo traveling. He records his experience primarily with his digital camera, GoPro, and iPhone. He is concerned with the safety and storage of his photos and vide footage. He avoids loneliness by maintaining his blog anf social media websites. He is focused on creating higher conversion rates for his content and often pushes himself to try new things to get the best photos. While seemingly self-centered, he is very compassionate about his partner, family, and followers.

## APPENDIX H

### DESIGNERS' RECRUITMENT POST

#### *Technology Use during Solo and Nomadic Travel*

Pre-requisites: HCDE 210/other prototyping courses or equivalent experience, familiarity with UCD.

Level: Junior, senior, and master's level students with a strong design background; Master's and PhD students with backgrounds in computer science, social science, and design

Are you interested in travel? Would you like to learn about solo and nomadic travelers' use of technology while supporting their adventures through design? In this fun and challenging DRG, we will draw on theory to explore the design space for solo and nomadic travelers. We will learn about qualitative research, in-depth interviews, emotional design, and prototyping wearable technologies, and share our designs with solo travelers who visit our class. While we will not be tackling Everest (or Mount Rainier) to evaluate our designs, we will have stimulating and inspiring conversations throughout the design process.

All students from BS to PhD who meet the requirements are welcomed to apply, but we are keeping this DRG relatively small (around 10) and are looking for a diverse group of dedicated and enthusiastic students who are interested in participating for 2 credits. To join the group or for questions, please email Mania Orand ([orand@uw.edu](mailto:orand@uw.edu)) and include your relevant experience (preferably your portfolio) and a brief statement expressing your goals for participating.

## APPENDIX I

### SCHEDULE/SEQUENTIAL EXPLANATION OF DESIGN PROJECT 3

The designers met once a week for 2 hours over a period of eleven weeks. Below is an overview and summary of the main activities for each session.

Session / objective	Activities & Readings
<b>Week 0 - Preparation</b>	<ol style="list-style-type: none"> <li>1. Explored solo travel weblogs to familiarize themselves with the domain</li> <li>2. Read a short paper about the building blocks of experience. The goal was to begin the process of developing a design language for user experience in our group. We'd like to learn what does designing for user experience mean, what are qualities of experience, and what influences experience.</li> <li>3. Searched for mobile or web apps designed for solo travelers or nomads and download one. These apps were different than general travel apps such as TripAdvisor, Kayak, or travel Meetups. I asked them to take notes about their experience of working with the app using the building blocks of experience paper and bring your notes to the first session.</li> </ol>
<b>Week 1 - Introduction &amp; inspiration</b>	<ol style="list-style-type: none"> <li>1. Discussion around what do we know and what do we want to know about solo travel</li> <li>2. Identified the themes emerged during the discussion.</li> <li>3. Sketched their ideas based on the initial understanding of solo travelers' needs and the emergent themes.</li> <li>4. Discussed the designs and list ideas and questions for future sessions.</li> </ol>
<b>Week 2 - Empathize / understand solo travelers' needs</b>	<ol style="list-style-type: none"> <li>1. Discussed "Designing for the self".</li> <li>2. Discussed the 1st round of coding interview excerpts, looking for STs' needs.</li> <li>3. Made affinity wall and synthesize the codes.</li> <li>4. Sketched and share initial ideas to support STs' needs.</li> </ol>
<b>Week 3 - Empathize</b>	<ol style="list-style-type: none"> <li>1. Discussed Research through Design.</li> <li>2. Discussed the 2nd round of coding the new set of interview excerpts, looking for STs' needs.</li> <li>3. Made affinity wall and synthesize the codes.</li> <li>4. Discussed the 4 domain dimensions emerged in the 1st phase of this research.</li> <li>5. Discussed design ideas to support STs' needs based on the 2nd</li> </ol>

	round of coding.
<b>Week 4- Empathize</b>	<ol style="list-style-type: none"> <li>1. Discussed book “Designing pleasurable products”.</li> <li>2. Discussed the 3d round of coding the new set of interview excerpts, looking for STs’ needs.</li> <li>3. Made affinity wall and synthesize the codes.</li> <li>4. Maslow’s theory emerged from synthesizing the codes</li> <li>5. Introduced Matrix, a process to map domain dimensions with theory dimensions</li> <li>6. Designers identified their top 3 design space priorities based on the matrix. They designers will be put into groups based on their priorities.</li> </ol>
<b>Week 5 - Define</b>	<ol style="list-style-type: none"> <li>1. Designers got into groups of 3 or 4 individuals based on their design priorities.</li> <li>2. Designers discussed their selected design space within their group.</li> <li>3. Designers brainstormed their design ideas.</li> </ol>
<b>Week 6 - Ideation</b>	<ol style="list-style-type: none"> <li>1. Each group discussed their design challenges and plans to address them.</li> <li>2. Continued brainstorming design ideas</li> <li>3. Presented design ideas to other designers to get feedback</li> </ol>
<b>Week 7 - Ideation</b>	<ol style="list-style-type: none"> <li>1. Each group discussed the literature they’ve read about their design ideas.</li> <li>2. Each group analyzed and examined similar designs available on the market</li> <li>3. Each group sketched their top design idea.</li> </ol>
<b>Week 8 - Prototype</b>	<ol style="list-style-type: none"> <li>1. Each group created a low fidelity prototype</li> <li>2. Each group presented their prototype to another group to get feedback</li> </ol>
<b>Week 9 - Prototype</b>	<ol style="list-style-type: none"> <li>1. Continued working on the prototypes</li> <li>2. Received feedback from other groups</li> </ol>
<b>Week 10 - Test &amp; Refine</b>	<ol style="list-style-type: none"> <li>1. Presented high fidelity prototypes and received feedback</li> <li>2. Continued refining and improving the prototypes</li> </ol>
<b>Week 11 - Present &amp; Reflect</b>	<ol style="list-style-type: none"> <li>1. Presented the designs to solo travelers</li> <li>2. Solo travelers discussed each design and provided feedback</li> </ol>

## APPENDIX J

### THE DISTRIBUTION OF DESIGNERS' TOP 3 PRIORITIES

	Safety	Love & Belonging	Esteem	Cognitive	Aesthetics	Self-actualization	Transcendence	Total
<b>Preparation</b>				D4		D5		2
<b>Acclimatization</b>	D1		D3					2
<b>Exploration</b>		D2	D6 D7			D8 D15*		4
<b>Reflection</b>		D9 D10			D11 D12		D13 D14	7
	Safety	Love & Belonging	Esteem	Cognitive	Aesthetics	Self-actualization	Transcendence	
<b>Preparation</b>				D2				1
<b>Acclimatization</b>		D5 D4				D13		3
<b>Exploration</b>		D11 D7	D1	D8	D9	D6 D14	D10	8
<b>Reflection</b>		D12		D3				2
	Safety	Love & Belonging	Esteem	Cognitive	Aesthetics	Self-actualization	Transcendence	
<b>Preparation</b>	D8 D7 D14	D12		D9 D3			D5	7
<b>Acclimatization</b>	D6		D11				D2 D4	4
<b>Exploration</b>				D13		D10		2
<b>Reflection</b>						D1		1
<b>Total</b>	5	9	5	7	3	8	6	

D15 did not select second and third choices.

D16 was not present on that session.

## APPENDIX K

### DESIGN PROJECT 3 – PRESENTATIONS FEEDBACK FORM

Thank you for participating in Design for Solo Travelers presentations.

**Step 1:** Please take a few moments to answer the following questions about your background:

- 1- Would you consider yourself a solo traveler?    Yes            No
  
  - 2- How long have you traveled solo, combining travel duration across all trips?  
Less than a month    1-6 months            6-12 months            over 12 months
  
  - 3- In what year was your most recent solo trip:  
2016    2010-2015    Prior to 2010
- 

**Step 2:** We'll have 5 presentations for up to 8 minutes each, followed by 7 minutes to discuss the proposed design and the need(s) they attempt to address. During the discussion period following each presentation, please take some time to provide your answers to the 2 questions on the following pages. Each team has a separate feedback form with their name written on top of the page.

**Team 1: snapscent**

1- How important do you think the need(s) this team's design tried to address are to you as a solo traveler? (If you have no solo travel experience, make your best judgment based on your knowledge of solo travel.) Please respond on a scale of 1 (not important at all) to 5 (extremely important).

1      2      3      4      5

Please explain your answer.

2- How effectively did this team's proposed design address the identified need(s)? Please respond on a scale of 1 (not effective at all) to 5 (extremely effective).

1      2      3      4      5

Please explain your answer. E.g., you might discuss critical, superfluous, or missing features.

**Team 2: Solo Stick**

1- How important do you think the need(s) this team's design tried to address are to you as a solo traveler? (If you have no solo travel experience, make your best judgment based on your knowledge of solo travel.) Please respond on a scale of 1 (not important at all) to 5 (extremely important).

- 1      2      3      4      5

Please explain your answer.

2- How effectively did this team's proposed design address the identified need(s)? Please respond on a scale of 1 (not effective at all) to 5 (extremely effective).

- 1      2      3      4      5

Please explain your answer. E.g., you might discuss critical, superfluous, or missing features.

**Team 3: Color Away**

1- How important do you think the need(s) this team's design tried to address are to you as a solo traveler? (If you have no solo travel experience, make your best judgment based on your knowledge of solo travel.) Please respond on a scale of 1 (not important at all) to 5 (extremely important).

1

2

3

4

5

Please explain your answer.

2- How effectively did this team's proposed design address the identified need(s)? Please respond on a scale of 1 (not effective at all) to 5 (extremely effective).

1

2

3

4

5

Please explain your answer. E.g., you might discuss critical, superfluous, or missing features.

**Team 4: Smart Bandana**

1- How important do you think the need(s) this team's design tried to address are to you as a solo traveler? (If you have no solo travel experience, make your best judgment based on your knowledge of solo travel.) Please respond on a scale of 1 (not important at all) to 5 (extremely important).

- 1      2      3      4      5

Please explain your answer.

2- How effectively did this team's proposed design address the identified need(s)? Please respond on a scale of 1 (not effective at all) to 5 (extremely effective).

- 1      2      3      4      5

Please explain your answer. E.g., you might discuss critical, superfluous, or missing features.

**Team 5: Journey**

1- How important do you think the need(s) this team's design tried to address are to you as a solo traveler? (If you have no solo travel experience, make your best judgment based on your knowledge of solo travel.) Please respond on a scale of 1 (not important at all) to 5 (extremely important).

1

2

3

4

5

Please explain your answer.

2- How effectively did this team's proposed design address the identified need(s)? Please respond on a scale of 1 (not effective at all) to 5 (extremely effective).

1

2

3

4

5

Please explain your answer. E.g., you might discuss critical, superfluous, or missing features.

# APPENDIX L

## DEFINITION OF AFFLUENT USED IN THIS DISSERTATION<sup>11</sup>

### Affluent definition

Respondents who fall into the income bracket listed below are classified as "Affluent" travellers for the purpose of this Study. The definition complies with the minimum income requirement for ownership of Visa premium cards.

Asia Pacific		Europe, Africa and the Middle East		Americas	
Country	Monthly Income	Country	Monthly Income	Country	Monthly Income
Australia	AUD 8,501 & above	France	EUR 4,851 & above	Brazil	BRL 10,801 & above
China	RMB 10,001 & above	Egypt	EGP 21,001 & above	Canada	CAD 10,001 & above
Hong Kong	HKD 50,001 & above	Germany	EUR 3,251 & above	Mexico	MXN 82,001 & above
India	INR 80,001 & above	Kuwait	KD 1,686 & above	United States of America	USD 9,001 & above
Indonesia	IDR 15,000,001 & above	Morocco	MED 25,001 & above		
Japan	JPY 747,001 & above	Russia	RUB 70,001 & above		
Korea	KRW 7,000,001 & above	Saudi Arabia	SAR 20,001 & above		
Malaysia	RM 15,001 & above	South Africa	ZAR 30,001 & above		
Singapore	SGD 11,001 & above	United Arab Emirates	AED 25,001 & above		
Taiwan	TWD 67,001 & above	United Kingdom	GBP 6,001 & above		
Thailand	THB 100,001 & above				



<sup>11</sup> Millward Brown, Visa Global Travel Intentions Study 2015