

Disambiguating ambiguity
Or,
Looking beyond uncertainty as the source of ambiguity
in description systems

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Abstract

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Representation both signals presence and advocates for resources; how we approach this work is informed by the context in which it takes place. In cultural heritage institutions (CHIs), items are represented through catalog records, which are shaped by a variety of infrastructures from standards to software. These structured descriptions, which inventory and facilitate access to items while marking their role as members of a collection, must signal the unique identity of each item, disambiguating each from similar others. In knowledge organization, and classification theory particularly, disambiguation is treated primarily as a process of moving from uncertainty to certainty. By mapping the terrain in which these surrogates are made and

inviting practitioners in the field to share challenges encountered in their work, this dissertation asks what it means for something to be ambiguous in structured description.

Examples of friction and ambiguity from the field extend beyond experiences of temporary uncertainty. Working through technical and ethical issues, often with inadequate resources to attend to challenging cases, practitioners explore a variety of interventions for addressing the limitations of description systems. This dissertation contributes a framework for investigating the frictions of representation in CHIs and beyond. Doing so may help us to imagine alternative approaches to this work and to advocate for a variety of resources that can support items, collections, institutions, and the practitioners on whose labor this work relies.

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I Introduction	I
I.1 Introduction	1
I.2 Background of the Problem: Why Represent?	2
I.3 Statement of the Problem: The Ambiguity of Disambiguation	3
I.4 Purpose of the Study: Disambiguating Ambiguity	4
I.5 Exploring Ambiguity in Description Systems	4
I.6 Significance of the Study: Frameworks for Inquiry and Design	5
I.6.1 Theoretical	5
I.6.2 Pragmatic	6
I.7 Further Research	6
I.8 Controlled Vocabulary: Disambiguating the Field	6
I.9 Assumptions and Limitations	9
I.10 Overview of Work	9
I.11 Conclusion	11
2 Literature Review	12
2.1 Introduction	12
2.2 The Aims of Bibliographic Representation	12
2.2.1 The Catalog: Inventory and Access	12
2.2.2 Representation As Disambiguation	13
2.2.3 Foundational Perspectives in Bibliographic Classification	14
2.3 Critical Perspectives in KO	17
2.4 Identity in KO and Beyond	20
2.5 Disambiguating Beyond KO: Concepts and Uncertainty	21
2.6 Design in KO	24
2.7 Taxonomy of Ambiguity	25
2.7.1 Simultaneity	25
2.7.2 Uncertainty	26
2.7.3 Residuality	27
2.7.4 Strategy	27

2.8 Conclusion	28
3 Research Methods	30
3.1 Introduction	30
3.2 Why Disambiguate Ambiguity?	30
3.3 Origin of a Question: Miscellany, Otherness and Ambiguity	30
3.4 Why KO?	32
3.5 Research Questions	32
3.6 Methodological Commitments: Pragmatism in KO	33
3.6.1 Pragmatism and Standpoint Theory	34
3.6.2 Researcher Standpoint	35
3.7 Methods: Reflective Approaches for Messy Questions	35
3.7.1 Mapping the Terrain of Description Through Archaeology	35
3.7.2 Reflecting on Ambiguity with Practitioners	36
3.8 Research Design	36
3.8.1 Situating Description	37
3.8.1.1 Archaeology	37
3.8.1.2 Conceptual Model Building	38
3.8.1.3 Reflection on the Limits of KO	38
3.8.1.4 Pilot Study: Representing Nonbinary Gender	39
3.8.2 Capturing Practice	40
3.8.2.1 Setting	41
3.8.2.2 Participants	41
3.8.2.3 Data Collection	42
3.8.2.4 Data Analysis of Interviews	43
3.8.2.5 Representing Research: From Dissertation to Zine	44
3.9 Conclusion	45
4 Archaeology of Description	46
4.1 Introduction	46
4.2 Mapping the Terrain of Description	47

4.2.1 Defining Catalog Description	47
4.2.2 Participants	48
4.2.2.1 Institutions	49
4.2.2.2 Catalogers	49
4.2.2.3 End Users	49
4.2.2.4 Items	49
4.2.2.5 Infrastructure Designers	50
4.3 Identifying the Strata of Description	51
4.3.1 Values	52
4.3.2 Standards	53
4.3.2.1 Disciplinary Standards	54
4.3.2.2 Descriptive Standards	54
4.3.2.3 Terminological Standards	55
4.3.3.4 Encoding Standards	55
4.3.3 Management Systems	56
4.4 Establishing Value	57
4.4.1 The Value of Cultural Heritage Institutions	58
4.4.1.1 Civilizing Institutions: Collective Education and Memory	58
4.4.1.2 Institutions As Assets	59
4.5 Values of CHIs	60
4.5.1 Access	61
4.5.1.1 Developing Collections for Access	61
4.5.1.2 Expanding Access	63
4.5.1 Description for Access	66
4.5.2 Stewardship	68
4.5.2.1 Maintenance for Use	69
4.5.2.2 Preservation	69
4.5.2.3 Contextualization	70
4.5.3 Description for Stewardship	71

4.6 Summary of Archaeology	74
4.6.1 Archaeology and Ambiguity	75
4.7 Making Sense of Descriptive Processes	75
4.7.1 Chain of Surrogation Model	76
4.7.1.1 <i>Item</i>	77
4.7.1.2 <i>Identity</i>	77
4.7.1.3 <i>Representation</i>	78
4.7.1.4 <i>Description</i>	78
4.7.1.5 <i>Participants</i>	78
4.7.2 Summary of Chain of Surrogation	79
4.7.3 Chain of Surrogation + Taxonomy of Ambiguity	79
4.8 Conclusion	81
5 Interlude: Constitutive Ambiguity	82
5.1 Introduction	82
5.2 Certainly Ambiguous	82
5.3 Ambiguity As Form	85
5.4 Ambiguity As Experience or Characteristic	86
5.5 Liberatory Ambiguity	87
5.5.1 Nonbinary: Identity in Contest with Category	87
5.5.2 Representing Ambiguous Identity	89
5.6 Description As Design	92
5.6.1 Ambiguity As Friction	93
5.6.2 Ambiguity As Affordance	93
5.7 Description As Resource Advocacy	95
5.8 Hospitality for Ambiguity	96
6 Reflective Practitioners on Encounters with Ambiguity	98
6.1 Introduction	98
6.2 Overview of Study	98
6.2.1 Review of Method	99

6.2.2 Reflective Practitioners	100
6.2.3 Institutional Contexts of Practitioners	100
6.3 Ambiguity in the Field	101
6.3.1 Sites of Friction	102
6.3.1.1 <i>Data Entry</i>	102
6.3.1.2 <i>Conceptual Friction</i>	105
6.3.1.3 <i>Material Friction</i>	107
6.3.2 Discussion of Sites of Friction	110
6.3.3 Ambiguities Observed	111
6.3.3.1 <i>Simultaneity</i>	111
6.3.3.2 <i>Uncertainty</i>	114
6.3.3.3 <i>Residuality</i>	116
6.3.3.4 <i>Strategy</i>	118
6.3.3.5 <i>Miscellaneous Ambiguities</i>	121
6.3.4 Discussion of Ambiguity Types	121
6.3.5 Discussion of Challenges in Description	122
6.4 Interventions	123
6.4.1 Technical Interventions	123
6.4.2 Ethical Interventions	124
6.4.3 Resource Interventions	126
6.4.4 Discussion of Interventions	127
6.5 Designing Description	128
6.5.1 Infrastructure Designers	128
6.5.1.1 <i>Design of Context-Agnostic Vocabularies</i>	128
6.5.1.2 <i>Design of Context-Embedded Identity Management</i>	130
6.5.1.3 <i>Catalogers As Infrastructure Designers</i>	132
6.5.2 Reflective Designers	133
6.6 Conclusion	134
6.6.1 Summary of Findings	134

<i>6.6.1.1 Finding Ambiguity in Description Systems</i>	134
<i>6.6.1.2 Designing for and with Ambiguity</i>	136
6.6.2 Tools for Focusing on Blurriness	138
<i>6.6.2.1 Reflection on Taxonomy of Ambiguity</i>	138
<i>6.6.2.2 Reflection on Chain of Surrogation</i>	138
6.6.3 Limitations of This Study	140
6.6.4 Why Disambiguate Ambiguity?	141
7 Conclusion	142
7.1 A Name Signifying Nothing	142
7.2 Summary of Work	142
7.3 Reification and the Export of False Certainty	146
7.4 Making Representation Count	147
7.5 Ambiguous Design	148
7.5.1 [Re]ambiguation as Advocacy	149
7.5.2 Inconvenient Methods: Slow Categorization	150
7.5.3 Not-Its: A Map of False Resemblances	152
7.6 Conclusion: Therkelson's Scrapbooks	153
Bibliography	156
Appendix A: Recruitment and Interview Materials for Studies	167
Appendix B: Table of Practitioners and Infrastructure designers	177
Appendix C: Zine	182

1 Introduction

1.1 Introduction

A classification scheme is a systematic ordering of things. Spend ten minutes trying to develop a coherent categorization approach for some simple objects, such as writing implements or hats, and you will soon discover the challenges of drawing clear distinctions between types. Now imagine attempting to classify almost everything. A few people in history have set their gaze toward some massive organization project, setting out the classes for every living thing (biological classification), or every possible subject (bibliographic classification). Yet even these classificationists have had hang-ups, some sections of the world they have set out to organize that they simply can't wrap their head around. For Linnaeus, it was lichens; for Henry Bliss, it was jazz.

A 19th-century scholar of lichens noted that Linnaeus, "who never pretended to be a friend of the cryptogams," designated lichens as *rustici pauperrimi*, which might well be translated as "the poor trash" of vegetation "(Schneider, 1898, p. 5). Whether the "father" of biological classification was disdainful or merely confused by these unusual flora, his taxonomy greatly underdescribed them—and his prejudices carried on amongst many botanists until fairly recently. While lichens have garnered greater interest, they remain difficult to classify due to their wildly variable morphologies and unusual hybridity. While we might imagine that this variability was the cause of Linnaeus's original frustration, lichens are not the only biological class that is difficult to draw a circle around when held up to contemporary scrutiny. As basic a category as fish is coming undone as biologists consider the characteristics of the specimens they observe. Will we reject this classification system as our understanding of variation increases, or modify it to reflect ever more nuanced understandings of living things and the relationships between them? How is a classification system useful when it clearly misrepresents swaths of the world it seeks to order? When our attempts at tidy description misrepresentations of the world?

Linnaeus's inability to engage with all aspects of his universe was not unique. In *Organization of Knowledge and the System of the Sciences* (1929), Henry Bliss called for the development of a classification scheme that could, he hoped, prevent future world wars, as organization of all knowledge would facilitate mutual understanding between nations. Still, he doubted that some genres, like jazz, could prove worthy of inclusion in the canon of culture. "The jazz music, the poorer-than-jazz poetry, the degenerate drama, and the bizarre contortions that afflict our senses in the art exhibitions should be made to justify humanistically their pretensions to be expressions of nature or of human nature" (Bliss, 1929, p.59). Jazz was a vibrant and popular emerging form, which should have been warrant enough for its inclusion in his vision of universal description. Instead,

Bliss doubled down on justifying such exclusion in spite of the fact that such censorship might seem antithetical to the project of universalizing knowledge.

Contemporary classification schemes of course recognize the existence of jazz, and other emergent genres eventually make their way into formal rules for representation. Nonetheless, the gatekeeping function of these systems remains. Some things will always be difficult to represent by following the rules of our systems.

The marginalization of lichens and jazz in their respective classification schemes reflect the prejudices of their designers. The catalog of items that they have represented will appear to the end observer to be tidy and ordered. Ambiguities will be papered over. The challenges of representation will be rendered opaque, with the item misrepresented in some way. Or, perhaps, the catalog record will be annotated in an effort to capture the assumptions and questions of the cataloger. The tools might be edited, amended or extended. Yet schema limitations such as these are not the only cause for pause in representation work. Ambiguities are present throughout the descriptive process, often invisible due to the demands of representation that our descriptions disambiguate.

What does it mean for something to be ambiguous? The term *ambiguity* conjures both experiences of uncertainty and encounters with things that defy simple categorization. Ambiguity is associated with a sense of uneasiness that can exceed the discomfort of uncertainty, a sense that something isn't right or doesn't fit. My research addresses the question: How can explorations of ambiguity in representation practices support the design of description systems? This project establishes a framework for facilitating such explorations and considers how a variety of participants view ambiguity. These findings may suggest useful approaches for the design and implementation of information systems.

1.2 Background of the Problem: Why Represent?

Representation is the transformation of an item into its description. This work is done in the context of some institution that collects items, both to inventory the collection and to provide for its future access. Different institutions can use the same tools and rules to shape and sort their descriptions, despite holding very different items in their collections. Conversely, two different institutions might hold similar collections but opt to represent them using a different set of rules and tools. The approaches taken by these institutions will be informed by a variety of constraints including institution type, mission, budget and previous practice. Regardless of the collection or the tools and rules used to represent it, the goal is to have a catalog that both notes the existence and location of each item and establishes the connection between it and the rest of the items in the collection.

Categorization organizes the world along various lines for diverse purposes. Classification is the most formal categorization practice, drawing on standards and rules developed by an institution or organization, and usually undertaken by professionals. Less formal categorization practices require similar transformations of observations of things into descriptions of those things, but may be guided by fewer, less systematic, or more narrowly focused guidelines. Assigning things to categories allows us to consistently arrange representations of them in our systems.

Descriptions highlight these categories, along with other characteristics relating to the form and origin of an item. Descriptive records can employ restricted formats that rely on a predetermined set of fields, or take more narrative approaches such as we find in archival finding aids. My work considers ambiguity in description systems across cultural heritage institutions (CHIs).

1.3 Statement of the Problem: The Ambiguity of Disambiguation

The pragmatic aim of representation through description marks the importance of an item, locating it within a domain and a collection. Describing items records presence, facilitates access, and advocates for resources such as shelf space or increased collection development. Because of these complex motivations, the literature of classification is concerned with disambiguation, which is intended to create stable, accurate and faithful representations of each item. The discipline of knowledge organization (KO) provides rich and thoughtful considerations of how we go about determining what it is we are trying to describe.

For classification theorists working through the mid-20th century, including Dewey, Bliss and Otlet, there was a belief that a true and correct identity that could be determined through careful study. While later theorists such as Ranganathan (1967) viewed identity as a contextual statement rather than an absolute truth claim, ambiguity has been treated as a state of ignorance or uncertainty which could be exited and eliminated via the classification process.

Critical conversations among scholars and practitioners have highlighted marginalization and harm perpetrated by our representation practices. While these discourses in KO about the purposes and consequences of description invite us to notice what is left out of the narratives these systems impose, the question of what constitutes or contributes to ambiguity has remained under examined.

In this dissertation, I take various approaches to understanding ambiguity and its role in description systems. In addition to exploring how it relates to critical discourses in the field around othering and marginalization, I consider how we might be able to see ambiguity as something other than harmful.

I.4 Purpose of the Study: Disambiguating Ambiguity

My work expands the view of ambiguity as a temporary experience by looking at concrete and conceptual aspects of representation from the perspective of multiple participants. Considering the experiences of individuals engaged with representation, from system designers to end users, I asked both what renders something ambiguous and how that encounter is navigated. By disambiguating ambiguity, I hope to highlight the circumstances and structures that make ambiguity harmful in some cases and merely inefficient in others, while also understanding when and how ambiguity may be an affordance. This framework for encountering and describing ambiguity in information systems may invite possible ameliorations or design approaches for addressing these issues.

I.5 Exploring Ambiguity in Description Systems

Given the consensus on disambiguation as a goal of representation, exploring ambiguity might seem an idiosyncratic enterprise. Critiques demonstrating the limitations of description systems have already transformed the ways that designers and practitioners think about the consequences of this practice. Yet discussion of challenges in representation often centers on human identities. This work began with a curiosity about how similar issues might be present in cases where human identity was not the source of the challenge in doing representation work. In keeping with the pragmatic commitments of the practice, I asked how explorations of ambiguity in representation practices can support the design of description systems.

Having set terminology for this field, I have asked questions about ambiguity in representation work. The following questions guided my research:

1. Where does ambiguity arise in description systems?
2. What factors lead to ambiguity in description systems?
3. How might we gain insights around ambiguity in these systems to better serve participants?

The first question attempts to locate where and how we note the presence of ambiguity in descriptive records. It further asks who might notice that such ambiguities are present and what aspects of the record could signal some lack of accord with their expectations of clarity. The second question digs deeper, asking how social and technical infrastructures constrain what is possible in these systems. To answer these questions, I considered examples of ambiguity drawn both from the literature of KO, and from interviews with people about their experiences using description systems.

These description practitioners and infrastructure designers illuminated a range of frictions and ambiguities that they experience or notice in the process of doing their work. The third question invites a reflection on the previous two questions and a synthesis of the responses, suggesting possible avenues for future work in the design of description systems.

This project has two primary components. First, I considered the broader context in which representation in CHIs takes place and developed models that allowed me to refine my approaches to finding and discussing ambiguity in description systems. Next, I looked to the experiences of practitioners in the field of description to share examples of challenges in their work. Viewing these practitioners as designers of descriptions or of infrastructures, I asked what moves they make in identifying the goals and constraints of their work.

I.6 Significance of the Study: Frameworks for Inquiry and Design

This work offers both theoretical and practical contributions to the field of KO by introducing frameworks for considering the locations and roles of ambiguity in description systems and considering potential design responses to it.

I.6.1 THEORETICAL

Disambiguation is a primary goal in representing collections, yet ambiguity is not well defined or described. Ambiguity is sometimes startling, or actively confusing. Other times it is invisible, a kind of confidence trick in which you assume there is certainty where there is none. In order to describe what ambiguity might be in the context of structured description, we need tools for noticing what and where it might be. Two models introduced in this work offer an approach for asking questions that allow us to notice and locate a variety of types of ambiguity that are present both in the practice of representing items and in their descriptive records. The first, a taxonomy of ambiguity, introduced in Chapter 2, expands the concept beyond temporary uncertainty by describing a variety of sources and consequences of ambiguity. Each type might have distinct ameliorations. The chain of surrogation, a model I introduce in Chapter 4, offers a temporal map of the process by which a surrogate of an item is created. This institution-agnostic model helps us to consider the material, conceptual and infrastructural considerations of representation and ask where in this chain ambiguity or other friction is experienced.

I.6.2 PRAGMATIC

Representation through description advocates for resources ranging from shelf space and budgetary support to attention. Ambiguity in description is not only a confusion of perception about the identity of an item but may be related to hesitations in determining which advocacy needs ought to be prioritized and met. By noting sources and locations of ambiguity, we can ask: What are the consequences? Is there anything to be done about it? Is there anything we need to know about the limits of disambiguation? Asking and answering such questions will aid in making use of and designing for the allocative powers of our description systems.

I.7 Further Research

The framework offered in this study can facilitate further exploration of the role of ambiguity in other information systems. This study primarily considers CHIs and their practices of description. The rules that govern description are generally most structured in libraries and least structured in museums, yet all of these settings have a clear responsibility to inventory an existing collection and provide for its future use through the set of descriptions known as a catalog. Each setting has a unique set of commitments and challenges in doing representation work, as well as unique approaches to resolving them.

Understanding how these layers of infrastructure work in tandem to define what is possible allows us to ask what layers are present in other settings where representations are generated. These issues are not exclusive to CHI contexts. As a number of scholars of KO have pointed out, these issues are present in information systems ranging from big data sets (Shaw, 2015) to shopping infrastructures (Feinberg, 2017). Disambiguation is a goal of many information systems, yet we routinely see examples of systems that do so poorly, even dangerously, as they use inappropriate proxies for categorization, privileging misrepresentations that can result in harms including misallocation of resources.

Representation in the description systems examined in this research attend to mostly qualitative metadata, yet the act of representation is always also quantitative, a means of measuring what is present both as a resource and as a recipient of resources. Transforming our approaches to representation requires a recognition of the limits of description practices as well as more refined approaches to their deployment.

I.8 Controlled Vocabulary: Disambiguating the Field

The literature of this field uses many terms that have multiple meanings. In order to consider these themes consistently, a glossary has been developed to fix the meaning of terms throughout my work. These definitions are not meant as arguments for a single or correct definition. Following the practice of controlled vocabularies (CVs) used in this field, I have included guidance on usage: UF (use for), BT (broader term), and NT (narrower term).

Ambiguity

This work is primarily concerned with asking what *ambiguity* means in representation practices. As is further explained in Chapter 2, the focus on this term stems from the fact that disambiguation is a primary goal of representation in cataloging. A simple, albeit teleological, definition of ambiguity as the focus of the research question here is *that which is makes disambiguation difficult or impossible*. Therefore, while other discussions of ambiguity in art and philosophy may be briefly considered, I will not use this term to make claims outside of the site of this research.

Item

In this work, I will use the term *item* to refer to the unique units held by an institution that are represented via individual descriptions. Other common terms used to signify a unit include forms and formats that are not universal to all collections. The terms *asset* and *resource* are terms often present in discussion of the goals, values and abilities of institutions in expansion and maintenance of their collections. Items are represented through identification of their salient characteristics related to creation (such as author, publisher and title), subject, and material form. UF Document, object, asset, resource , record

Collection

The primary sites of this research project are CHIs that hold a variety of items central to their mission. These items seen in the aggregate are the *collection* of the institution and may include a wide array of media types. The goal of a catalog is to represent the entire contents of an institution's collection for both inventory and access. This term is used despite the fact that in archives *collection* refers to a group of items rather than the total sum of the institution's holdings.

Representation

The term *representation* here will refer to the broad goal and act of highlighting the presence of items in a collection, rather than to recording the characteristics of particular item. Representation strategies are informed by goals and values of an institution. NT Description

Description

The representation of an item will result in its *description*, or catalog entry. A description is a surrogate for the item, allowing us to know what is present in a collection without having to

encounter each actual item. It is shaped and made accessible by the tools used in its creation, from the software that structures description through input fields, to other rules adopted by an institution. This term is favored over *record* in most of this work to minimize confusion with records as items in archives. **BT** Representation **UF** Catalog record

Infrastructures

Following Star (2012), I consider *infrastructure* broadly in this work as both technical systems and relational structures that shape what is possible. In some cases, work on infrastructures is explicit, as in the case of software design or development of standards. In other cases, it is embedded in other work, as when practitioners create or edit authority files. This term will be used to point to the various rules and tools, both formal and informal, that shape representation in description systems, including standards and less formalized best practices. **NT** Standards **NT** Collection management systems (CMS)

Description Systems

In this work, I will use the term *description system* to refer to networked catalog descriptions, regardless of the software and hardware used to structure and store them. This term points to an array of tools and rules that govern the creation and maintenance of these records and allows us to think about the ways that catalogs are and are not interoperable across contexts. **BT** Information systems **NT** Catalog

Institutions

An institution is an establishment with clear aims. This project considers CHIs that develop collections and allocate significant resources to their care, including description. An institution can have multiple locations or facilities that are governed collectively. Thus, the University of Washington Libraries are an institution, as are the Seattle Public Libraries, though individual sites may also have distinct features. Institutions such as academic libraries may be embedded in other institutions, thus inheriting some of their resources and goals. The term *organization* is often used for this purpose but is not favored in this work due to the confusion with the concept of organization (arranging) that is central to description. **UF** Organization

Resources

The term *resource* is widely used in this field to refer to the units that are described in a catalog (here referred to as *items*). I break with this terminological convention, reserving its use to point to an array of material and conceptual *resources* that are associated with institutions, including money, labor, space, and attention. Because this work considers the ways that representation is an act of advocacy for resources, this expansive use of the term is warranted, in spite of possible confusion where the term resource is used instead of item as in discussion of Resource Description and Access (RDA).

Participants

This work will use the term *participants* to refer to range of people who engage with institutional representations in some way. Usually, I will favor a more specific term.

Practitioner is the term I most often use for an individual who describes an item. While most of the people I spoke with for this study are *catalogers*, others have titles such as archivist or metadata librarian. I will use these other terms where relevant.

Infrastructure designer is the broad term I use to point to those whose work supports description outside of a specific site or collection. These individuals can contribute to the development of standards or CMSs in myriad ways. While some infrastructure designers have a focused role on the development of a single piece of infrastructure, in this work I also consider the ways that practitioners in institutions take on infrastructure design roles.

Other participants include end users, administrators, or even those who speak for—or as—items.

UF Stakeholder

1.9 Assumptions and Limitations

Although this work develops a framework of definitions and models for thinking about ambiguity in description systems, they are not offered as statements of a singular truth regarding the relationship between items and their representations or about this work across all institutions. Rather, it is offered as an attempt to start a conversation about about the challenges and limits of disambiguation.

While advocating for examination of ambiguity might seem like an invitation to shrug at the impossibility of doing perfect representation, or a call for the dismissal of the enterprise, I hope instead that it invites us to see new sites for advocacy, places where we can intervene not only by revising vocabularies but through the development of tools that allow us to mark the situatedness of representation.

1.10 Overview of Work

Disambiguation is a given; ambiguity is poorly defined. This work will explore what we notice when we focus on ambiguity in descriptive practice, looking both at stakeholders and the systems in which this work takes place. The tone I have taken shifts across this work, attending to the pragmatic necessity of contextualization in some chapters and expanding beyond conventions of

academic statements in others. This has been an intentional strategy and experiment in considering alternative modes of expression as a means of representing ideas.

A review of the literature in Chapter 2 considers how ambiguity has been characterized in the discipline. This discussion includes foundational and critical contemporary scholarship within the field of KO, as well as relevant work in adjacent fields such as science and technology studies (STS) and cognitive linguistics. A brief overview of the contours of ambiguity in other fields is also introduced. This review informs the framing of my research questions by pointing to lack of focus in the field on the constitution of ambiguity. At the conclusion of this chapter, I offer a taxonomy of ambiguity, which synthesizes various characterizations of ambiguity from across the literature. This taxonomy is revisited throughout the project.

Chapter 3 outlines the methods of this research project, first offering an evolution of the research questions, then outlining the approach taken in performing this research. First, I conducted an archaeological exploration of the broad social and technical contexts of the practice of description. From this exploration I developed a model that considers both the process of description and potential sites of ambiguity. This model informed interviews with practitioners in which I asked about challenges they encounter in their work and how they navigate them.

My findings are introduced in three chapters. Chapter 4 discusses the archaeological exploration of description. Treating the catalog as the surface of the terrain excavated, I considered the relationships between CMSs, standards and values in CHIs in shaping what is desirable and possible in description, as well as the roles of multiple participants in shaping and evaluating them. To better understand how an individual practitioner might encounter these strata, I introduced a conceptual model, the chain of surrogation, which maps the material and conceptual phases of description. Pairing this model with taxonomy introduced in Chapter 2, I established a framework for examining practitioner experiences with ambiguity.

The second findings chapter, Chapter 5, is presented as an interlude, wherein I supplement the archaeological findings on ambiguity with considerations from my personal experience, extending the language around ambiguity to allow for considerations of possible affordances as well as harms. I ask what it means to be ambiguous, whether it is possible for ambiguity to be constitutive of identity and suggest that by viewing ambiguity as a design issue we might consider the affordances it offers. This chapter also serves as an extended statement of my standpoint as a researcher, breaking form with academic writing structures in service of the experience I share.

Chapter 6 shares the findings of my conversations with practitioners working in a variety of libraries, archives, and museums, each of whom creates descriptions of items in their institution's collection. Using the chain of surrogation model and the taxonomy of ambiguity to guide conversations, I asked these practitioners what and where they experience challenges in their work and how they respond to it. I explored their examples of friction and of ambiguity, noting a variety

of interventions that they offered. This chapter also includes discussion of my interviews with two infrastructure designers, whose perspectives helped me to think about the implications of design changes in these systems. The perspectives of all of these participants contributed to expansion of my models and highlighted additional considerations for thinking about ambiguity in these systems.

Reflecting on these projects in Chapter 7, I point to the ways that issues of catalog description overlap with other forms of description and explore several potential design responses to ambiguity in description systems.

Finally, I offer a zine and activity guide that provides an alternative approach to the themes of this dissertation, which readers can read and print from Appendix C.

1.11 Conclusion

The demands of disambiguation lead to representations that suggest certainty and stability, even when practitioners understand the contextually contingent nature of their descriptions. I suggest that we might benefit from a shared vocabulary for noticing and marking the challenges we encounter. In this work, I offer two models as aids in thinking not only about ambiguity but about how our description systems function for a wide range of participants.

While individual practitioners design descriptions, they do so on behalf of institutions, using collective tools. These representations are not intended only for their creators, but to facilitate access for a community that may or may not understand the logic of existing schemas and tools for description. In order to improve our descriptive infrastructures and practices, we might benefit from collective reflection and articulation of possibilities. A single best approach may be neither possible nor desirable, yet a lingua franca of ambiguity could allow us to collectively and legibly discuss and respond to these frictions.

2 Literature Review

2.1 Introduction

This research asks what ambiguity means in the context of catalog representation, given the disciplinary goal of disambiguation. Bibliographic representation history and theory guides my understanding of what it means to systematically organize for a purpose. All classification systems use principles of division to guide practitioners in assignment of items to class. Tennis (2012a) defines classification as the “mutually exclusive, jointly exhaustive, set of hierarchically and systematically arranged classes” (p. 396). In contrast, categorization is “based not on a set of predetermined principles but on the simple recognition of similarities that exist across a set of entities” (Jacob, 2004, p. 527). Assigning items to categories allows us to create consistently arranged representations of them in our systems, which we often encounter as descriptions of the items. Yet cataloging is not only determination of categories and assignment of classes. It also attends to the material and originary aspects of an item, providing access to information about these characteristics through structured descriptions that highlight multiple forms of salient identity.

My work focuses on ambiguity in description broadly, but draws on the rich literature of bibliographic classification theory, which has attended to the nuances of assigning membership as a form of establishing identity. While representation and description are possible without categorization, description systems are structured using categorization as an organizing principle, at varying levels of granularity. My work is also influenced by theory and practices in archival description. In this review of the literature, I will highlight discourses around these issues in the library other institutional contexts. Perspectives on ambiguity from outside of KO are considered as well. Viewing description as a design practice, I will briefly explore discussions of design in KO. Finally, I will introduce a taxonomy of ambiguity that informs my research throughout this project.

2.2 The Aims of Bibliographic Representation

This work investigates what it means for something to be ambiguous in the context of the representation of items held by cultural heritage institutions (CHIs). The practice and theory of bibliographic representation is robust and specific, providing a rich framework for understanding the goals and challenges of cataloging.

2.2.1 THE CATALOG: INVENTORY AND ACCESS

The catalog of any institutional collection has multiple objectives. From an institutional perspective, it functions as an inventory, listing the contents of a collection for internal reference. Early catalogs were essentially lists of holdings, but even in this simple form they circulated beyond

the institution, functioning communicatively to highlight sets of interesting items (MacNeil, 2016). As collections expanded, the need to organize both physical materials and their catalog surrogates grew urgent. The challenge of inserting additions to the collection required an extensible system that would be hospitable not only to new volumes but to new subject groupings. Lubetzky described the objectives of the catalog as highlighting both the identity of a book and its character (1968). These two objectives create a tension between focusing on the unique and the collective at once. The inventorying aspect of the catalog requires bibliographic representation to highlight the identity of each item as distinct from every other. Yet a simple list arranged alphabetically by author or title, or chronologically by publication or acquisition date, did not aid the user in discovering the volumes by topic. Thus, bibliographic classification aims not to organize every book in the universe, but to organize every *subject* about which a book or document could be written. This network of topics allows the user to navigate the catalog and the shelves to find relevant materials together, creating the possibility of active browsing rather than reliance on known-item searches or serendipity.

While determining the identity of a published item might seem simple enough, the International Federation of Library Associations and Institutions (IFLA) introduction of the Functional Requirements for Bibliographic Records (FRBR) in 1998 attempted to parse differences between information objects related to their relationship with original *works*. As media formats proliferate, the question of what constitutes a unique identity continues to evolve. Determination of the character, or subject, of an item, is guided by classification schemes and other terminological standards, which allow us to place information objects in relation to others. Thus, catalogers attend to two different conceptions of identity, highlighting uniqueness and membership in particular categories.

These objectives of cataloging are supported by an array of infrastructures, which vary across institutional contexts. This work will consider both the explicit rules and tools that guide catalogers, such as standards, classification schemes and collection management software, as well as the goals, both explicit and implicit that are specific to professional roles and institutions. Regardless of the setting in which the work is done, the act of representation through cataloging pragmatically seeks to facilitate the use of items in a collection, even if the kinds of use possible vary across contexts.

2.2.2 REPRESENTATION AS DISAMBIGUATION

Bibliographic representation practice is highly prescriptive, supported by layers of infrastructure that guide catalogers in their work and assume each item can and should be accurately described. While these tools are refined with each version, they inevitably falter or fail in some situations. Some items will challenge even the most experienced cataloger. Their questions and

concerns are not often visible in the records they create, which makes it difficult to know what, if anything, might have been described differently.

Bibliographic description guidance rarely addresses ambiguity directly, instead focusing on the work of disambiguation through treatment of bibliographic entities and treatment of subjects. Disambiguation of identity attends both to differences between items and to differences between versions of those items, including creators, translations, editions and printings (Svenonius, 2000). This kind of disambiguation can be challenging in spite of models such as FRBR, which is anchored to cultural concepts of each term used. Materials from cultures that have variant concepts of and attributions of authorship, for example, make following the rules representation nearly impossible (Lee, 2017). This inability to represent significant characteristics introduces ambiguity into descriptive records.

Disambiguation in the treatment of subjects, which is the organizing principle behind bibliographic classification systems including Dewey Decimal Classification (DDC), Library of Congress Classification (LCC), Universal Decimal Classification (UDC), Bliss Classification and Colon Classification, attempts to make clear the distinctions and relationships between concepts. Other tools, including controlled vocabularies (CVs), also aid in the determination of subject or aboutness of items. While the past century has seen a move from certainty to contextuality in representation, schemes reflect the perspectives of their designers and are products of a particular time and place.

2.2.3 FOUNDATIONAL PERSPECTIVES IN BIBLIOGRAPHIC CLASSIFICATION

For classification theorists such as Bliss (1870-1955, U.S.), Ranganathan (1892-1972, India) and Otlet (1868-1944, Belgium), disambiguation was the work of determining the correct subject of each item. While each theorist had different ideas about the challenges of representation and the appropriate ways of facilitating subject access in cases of complexity, all were inclined to see challenges of disambiguation as an issue of insufficient understanding on the part of the classifier.

For Bliss (1933), knowledge was unitary and each subject discrete, allowing for its determination through careful study. Acknowledging challenging cases, he offered lengthy explanations of the appropriate approach, suggesting that it might take an hour or more to assign a subject to a book with a complex subject. While he espoused efficiency as a goal of classification schemes, his focus was on retrieval in collections with predetermined goals, encouraging librarians to order only books whose subject was already clear. This position, while perhaps practical in certain library settings, demonstrated a very limited view of the goals of a library collection. Efficiency was possible by simply keeping complex items out of the collection. Bliss focused on disambiguation as a process for describing complexity of subject in books that contained multiple topics or addressed

single topics through very specialized perspectives. The solution he suggested was specialization of knowledge on the part of the cataloger, with few tools to aid those lacking such depth. Thus, his conception of ambiguity seemed to be one of temporary ignorance on the part of a cataloger, borne of items that were out of scope.

Like Bliss, Ranganathan (1967) assumed that representation requires that one is capable of factual understanding of the item at hand, which required navigating three phases or planes: the idea plane (akin to pure concepts), the verbal plane (the nominalization of those concepts) and the notational plane (the alphanumeric abbreviated representation of the concepts). The greatest challenge to disambiguation as Ranganathan saw it was “occultation” by the verbal plane (p. 335). Getting stuck in the words and conventions we have around things can limit what we understand as the subject, or delude us into thinking we have discovered a new subject by renaming an old one. Catalogers had to be very careful not to rely on language or notation in the process of discovering a subject: first the subject would be determined on the idea plane and then its appropriate terminology and notation would be assigned. His colon classification facilitated complex expression of subjects, highlighting a number of item aspects and expressing relationships between them through notation. In Ranganathan’s view, disambiguation was a process of refining one’s understanding of each item in order to create a very precise representation. Catalogers would create a classificatory identity that had the shape, so to speak, of the subject at hand, drawn from the item in front of them. Ambiguity then might be characterized as the under-articulation of the distinctive shape of any given subject.

While his view of reality was similar to that of Bliss and Ranganathan, who did not view facts and reality as controversial or complicated, Otlet’s aims were different. Rather than design a classification system that would disambiguate books in order to deliver them to their readers, Otlet’s greatest ambition was to extract facts from the documents in which they arose. Rather than consider authorial intent in determining the subjects of books, he yearned to dispense with the author, to free facts from the mess of narrative (Frohmann, 2004; Rayward, 1997). According to Rayward and Frohmann, Otlet admitted the complication of extracting facts from some works and favored the ease of natural scientific facts over those pulled from social sciences. Disambiguation was separating the kernel of truth from the chaos of authorship. While his goals in many respects presaged hypertext and linked data, it is possible to see his divorce of facts from authors as a sort of injection of ambiguity: From what source does each fact come? The connections he drew between them all, through the framework of the UDC, prevented him from having to think too much about this, as new contexts were created for each fact. For Otlet, disambiguation was a very precise extraction of a fact from its source; ambiguity would be the mess of connections or the retention of the context of a fact.

In spite of their differences, Bliss, Otlet and Ranganathan shared many assumptions and were similarly certain of the utility and stability of their visions. Though each at times admitted to previous missteps, they all seemed to have the view that they, like science itself, were tending

toward greater truth and precision. Yet by the time that Ranganathan was publishing his last editions of the *Prolegomena*, others in the field were considering the limitations of these schemes.

Wilson outlined multiple ways that catalogers approached the determination of subject and detailed the pitfalls of each, from over-abundance of representation to misrepresentation. Challenging cases, he suggested, are always challenging; to pretend that the decision is anything other than subjective is ridiculous. In contrast to theorists like Ranganathan, who sought extraordinarily precise classifications, Wilson (1968) warned, "Our descriptions of the subjects of writings may err as easily through over-specificity as through under-specificity, if they depend on our notions about aims and purposes" (p. 81). That is, a cataloger's recognition of the presence of a subject in a document might not match the desires or understandings of a user.

Focusing on disambiguation of subjects to aid in discovery and retrieval of documents, Wilson saw ambiguity in descriptions more than in the experience of the cataloger encountering an item. Of particular concern to him was assignment of a single subject to classify an item: "The uniqueness implied in our constant talk of the subject is non-existent." (Wilson, 1968, p. 90). While indexing, or assignment of subject headings, posed a less artificially narrow statement of subject, Wilson was aware in this case, too, that determination of the right terms was subjective and not easily or evenly applied by all indexers. Wilson saw perfect disambiguation as impossible, though he did not go so far as to think that functional representation was impossible.

More recent scholars have recognized the challenges that Wilson noted and gone further in critiquing the assumptions that were held for the first hundred-plus years of bibliographic classification. Rather than imagining classification to be objective and real, they have discussed how one arrives at these determinations. Various forms of *warrant* inform determination of identity by establishing legitimate sources of information and terminology for description. Beghtol (1986, 2005) highlights the wide range of sometimes conflicting methods of warrant we employ in determining identity and character. In addition to considering common forms of semantic warrant, she proposes ethical warrant as a means of anticipating the consequences of classification. More recent work by Bullard (2017) has further explored the ways that warrant can be layered in making decisions in challenging cases where disambiguation is not possible by following one source of warrant alone. Thus, ambiguity arises when description fails to employ clear sources of warrant or applies them haphazardly.

Hjørland (2005), highlights the limitations imposed by the positivist roots of bibliographic classification. Mirroring a movement toward situated knowledge in other fields, he suggests that we focus less on universalizing knowledge representation and instead turn to domain analysis as a method for maintaining responsible representations within disciplinary boundaries (Hjørland, 1995, 2002). The range of methods that comprise domain analysis include both qualitative and quantitative approaches that might not seem unfamiliar to readers of Bliss or Ranganathan, both of

whom assumed that in challenging cases some sort of disciplinary expertise would be required. Ambiguity, in this view, might be understood as arising from representation that is presented as domain agnostic.

While all of these scholars have attended to the pragmatic aims of representation and classification, their focus has largely been on conceptual ideals of identity and subject determination. However, Svenonius (2000, 2004), has drawn attention to the technical aspects of representation that both facilitate and impede these ideals. Characterizing competing approaches to classification work as tradeoffs between forms of integrity of representation, she is especially attentive to the technical limitations of these systems in fulfilling the bibliographic objectives. Echoing Wilson, Svenonius reminds us that representations should be intelligible to users, which might require a simple rather than richer and more expressive representation. She urges care not only for the description of each item in the collection, but for the requirements of an institution and the discipline of representation. To this end, she evaluates financial and labor costs of representation, in addition to considerations of interoperability, collaboration and automation (Svenonius, 2004). Rather than focus on approaches to disambiguation in particular acts of representation, she reminds us that the whole system needs to work. Ambiguity in this view would perhaps be atrophy or breakdown in which every item was hyper-specified at a cost to the system as a whole, or where lack of maintenance of a system renders it unintelligible to anyone but the catalogers themselves.

In these approaches to bibliographic representation, we can see a perpetual interest in disambiguation as a means of making representations work, even as perceptions of what is possible or desirable have changed. Yet disambiguation is offered as a synonym for both truth and clarity, sometimes pointing to precision and other times to usefulness. These are not always the same thing, yet they both can serve a goal of describing what exists in a given catalog. To invert the concept of disambiguation and ask what is ambiguous, I have found it necessary to stretch into what is left unsaid, to imagine what each author would characterize as either difficult or meaningless. From even this cursory overview of the foundations of bibliographic description, we can see that ambiguity is underspecified in a field that aims to minimize or eliminate its presence. More recent scholarship, however, has considered some consequences of representation that might be seen as implications of ambiguity.

2.3 Critical Perspectives in KO

Contemporary critical scholars of KO have unsettled the universal classification schemes that have been central to the work of most library representation. While their work is not always at odds with the pragmatic theorists considered above, it has interrogated aspects of these systems in hopes of transforming them. This work, broadly speaking, traces how that classification and other

descriptive practices have been historically created and implemented by dominant groups whose biases show up in the structures and vocabularies of these systems.

The presentation of KO as a science, as in the term *library and information science* has been critiqued by Mai (2002), who notes that science aims at prescription and prediction in a way that classification cannot. He follows Hjørland in advocating for domain analysis (Mai, 2004) and has continued to critique claims of classificatory neutrality (2013). Clarke (2018), sharing Mai's skepticism of the field as a science, suggest that it might be better understood as a design discipline, which seeks to make things possible. Feinberg (2014, 2015, 2017) has offered a parallel critique that invites us to look at classification systems (and data structures as well) as narratives that exhibit signs of authorial voice. Narrative can be seen as both a plot moving toward an end and as an accounting of what has occurred. These perspectives trouble our expectations that representation can establish perfect surrogates of the real world. Instead, they might be proxies that map objects to specific requirements of a system. Being aware of the narrative nature of classification may help us locate and understand its ambiguities as well.

Other critical scholars focusing on classification have paid attention to the ways that it handles and mishandles representation through analysis of both the origins and consequences of these systems. For example, Furner (2007) considers the power of dominant groups to set the standards of structure and vocabulary in classification systems, asking how we might evaluate their design and use. He points to the reifying aspects of social constructions such as race and suggests that we might highlight the feedback loops between arbitrary or relative classes and reality, interrogating both the structures and practices of classification. Olson's work on representations of gender and sexuality in classification systems asks us to reimagine representation structures. She argues not only that vocabulary can be oppressively freighted, but that the hierarchical structures of classification systems require adherence to a worldview in which all things are mutually exclusive, and dominance is encoded (Olson, 2002, 2007).

The limitations and abuses of representation of marginalized groups have documented in relation to a wide array of communities and identities, from Adler's work on representation of queer and trans identities in formal and informal bibliographic descriptions (2016, 2017), to a consideration by Higgins (2016) of Asian and Asian-American representation in DDC, and work by Fox (2016) on representation of intersex in DDC. While their methods and findings are diverse, they all highlight marginalization of human identities enacted by limited and limiting vocabularies. Calls for accountability in our systems include a consideration of a "taxonomy of harm," which would inventory the ways in which catalogs are consequential (Adler & Tennis, 2013). Questions that these scholars surface point to multiple sources and meanings of ambiguity. Here we might see the ambiguous associated with the marginalized or oppressed. However, following Olson, we might also positively see ambiguity as lurking in the possibilities of alternative structures of representation.

The examples cited here have advocated for alternative approaches to representation that would rebalance power, oriented toward correction of Western systems. Scholars of Indigenous knowledge scholars have analyzed representation of Indigenous cultures in dominant classification systems. In these analyses however, representations are compared to Indigenous descriptive practices, some of which have distinct structural assumptions associated with them (Hajibayova & Buente, 2017; Mouliason Sandy & Bossaller, 2017). Without directly addressing the issues of colonization related to both Indigenous knowledge and Indigenous experiences, appropriate representation is not possible. The remedy is not simply inclusive language or updated classes. Indigenous ways of knowing must be taken into account along with the knowledge-bearing or physical items that are to be represented. Duarte and Belarde-Lewis (2015) advocate for KO to create spaces for Indigenous ontologies to flourish, to bring community members into the practice of building and implementing classification systems and to allow the values of those communities determine the form their tools take. Examples from museums and archives offer approaches for appropriate representations of Indigenous knowledge in community and Western contexts (Bowe chop & Erikson, 2005; Glass, 2015). In the context of Indigenous knowledge representation, one might find multiple ways of thinking about ambiguity. In some cases, it might be seen as that which is only intended for specific communities, remaining invisible or opaque to outsiders. In other cases, it might be understood as a kind of relationality, something one can know through experience. Ambiguity could also be set aside as a non-concern, if in the emergence of Indigenous ontologies, the preoccupation with disambiguation as a primary goal diminished.

Consideration of the historical structures and contents of classification surfaces alternative conceptions of ambiguity. In his development of the notion of ontogeny, Tennis (2012b) emphasizes a commitment of bibliographic classification systems to an ever-changing definition of reality. He asks us to notice that attempts at correction of previous approaches to representation may hamper the usability of a classification tool and erase historical approaches to representation. As painful as it can be, visibility of historical changes to representation is crucial to understanding classifications critically. In this view, ambiguity might be seen as the gaps between successive uses of single subject terms, the fragmented historical thread of a concept.

Although the terrain of critical KO work is vast and varied, it points to the implications of representation beyond the walls of a given institution, attending to the ethical as well as material consequences of description. While this work does not define what ambiguity is, we can see multiple manifestations of harm that have been wrought through attempts at disambiguation that followed the perspectives of dominant groups. We can also see an attention to reconceptualizing both what representation systems can do and what they are. The expansive aspects of this inquiry suggest the possibility of viewing ambiguity as having the potential to offer some new possibilities, while reminding us that representation is always historically situated. Each attempt at correction shifts our responsibility to the past and future. As Drabinski (2013) notes, these systems will always produce

identities that defy the logic of categorization that they create; they will never reach a state of completed perfection. If ambiguity cannot be eliminated, it seems worth asking whether we might do something with it.

2.4 Identity in KO and Beyond

The term *identity* is used by Lubetzky (1968) to signal two bibliographic cataloging objectives: the determination and description of an information object. This is distinct from questions about the character or subject of that item. Yet determination of character requires engagement with the content of each item, asking what it is about. While the separation of the two objectives aligns with the process of cataloging, the notion that the *identity* of an information object is distinct from its content does not comport with common uses of that term.

In classification, identity is related to category membership. Categories are concepts made functional. There are competing and overlapping ideas about what constitutes a concept and what renders it stable enough to be used in a representation. In an overview of concept theories present in KO systems, Hjørland (2009) argues that concepts are stabilized by use. This suggests a tension between change (inevitable when one conceives of concepts as human constructs) and concretization. Hjørland does not elaborate on whether stabilization occurs via frequency of use or through some averaging of concept definitions. Moreover, it is not clear when we can consider concepts sufficiently stable for use, or how we might evaluate previously used concepts for possible change. The argument that we know what something means because we are in a culture that determines meaning may hold in the context of a domain, but real-world cataloging often requires doing representation work when we are not domain experts working for a bounded community. Thus, the instability of categories troubles the stability of the identities with which they are associated.

Representations are proxies for items, intended to model them as closely as possible without fully reproducing them. While we seek to represent the identity of an item, we recognize that our representation will not be identical with it (Furner, 2009). He argues that KO systems produce identity, both across instances in order to facilitate the finding of sets by system users, and between designers and users. They aim to represent concepts in a manner identical to the way that users will understand them. If a system fails to produce representations identical (or sufficiently so) with those their users would seek,, it will remain useless, even if internally consistent. Furner recognizes that human identity is both nuanced and ever-changing, and that it is internally decided. However the description practitioner might describe a person, it is up to that individual to decide whether their identity has been accurately represented.

Identity can be seen as marking difference (distinguishing characteristics, in line with Lubetzky's use of the term) or as marking sameness (membership in a category). This dual nature of

identity complicates the work of catalogers: on which basis are we seeking to order the world? How we approach this question will lead to distinct approaches in representation, which will affect the uses of that representation.

Consideration of identity in the context of other information systems can be illuminating as well. De Vries (2010) considers identity using Ricoeur's notions of *idem*, which is constituted through membership, and *ipse*, the unique identity. Exploring algorithmic intelligence and automated constructions of identity in social media, she makes the case that representation in these systems aligns with *idem* identity. While various kinds of membership are central to their function and utility, a system will never fully capture or represent a unique identity. Because all identity is composed of both *idem* and *ipse*, a purely *idem*-oriented representation will always be lacking. The limitations of representation outlined by Furner and DeVries might suggest that these systems never point to reality. Gorichinaz (2017) argues that information science has always only been concerned with one form of knowledge, *veritas*, which might be understood to be empirical reality, in contrast to *alethia*, or experiential reality. In this view, perhaps we should accept that accurate representation of human identity is out of the scope of our discipline. While humans can contest identity statements, items in collections cannot. Tensions between conceptions or aspects of identity may suggest or produce ambiguity in human and non-humans alike.

2.5 Disambiguating Beyond KO: Concepts and Uncertainty

Challenges related to representation of identity can be roughly characterized in one of two ways: marginalization or uncertainty. Understanding how these ideas are explored in KO and beyond provides a kind of scaffolding through which we might ask how and where to find ambiguity.

Critical scholarship treats inaccurate or inappropriate descriptions of (mostly human) identity as the product of the structure and vocabularies that privilege social power and produce marginalization. This view highlights the reifying power of systems to create the world in the image of their designers; the solution, which could disambiguate these alienated identities, is inclusion or self-representation. While KO theorists have viewed ambiguity as temporary uncertainty, we might wonder about the contours of uncertainty, as distinct from exclusion. In this section, I introduce a variety of conceptions of uncertainty from the field of KO and beyond.

It is tempting to solve the problems of identity through empirical determination, verifying identity through measurement of characteristics. This form of identification suggests certainty or verifiability. This approach is employed in subfields of KO such as bibliometrics, which statistically assesses connections between texts, authors, and institutions in order to understand impact and

influence of publications. While bibliographic classification does not consider such methods in determining identity or relationships between identities, such measurement is employed in the related field of concept theory. Measurement need not be precise in order to be useful to thinking about identity, as illustrated by two paradoxes. The ship of Theseus paradox considers how identity changes if parts of the whole are gradually replaced, as in the repair of a boat, board by board. If identity can be retained after replacement of every part, then the identity must lie somewhere outside the material of the object—an idea at odds with the cataloging objective of identification. If the identity does at some point change, when does it do so? Alternatively, the sorites paradox considers removing one grain of sand from a heap at a time, asking it is no longer a heap. What is the change that determines identity shift? How might we measure or otherwise notice when this shift has occurred? These questions accompany many experiences of ambiguity in representation.

In prototype theory, an approach to categories from cognitive science, we again encounter a curve of identity. But while the heap of sand slowly flattens, prototype theory retains the apex as the prototypical center of a category in which membership is graded. The more closely an item resembles this ideal center, the more certain we are of its identity. In this view, a category is made up of a set of characteristics that can be exhibited in varying degrees in actual specimens. The prototype can be described as an average of the exemplars of the category that an observer has been exposed to (Rosch, 1983). Critically, Rosch notes that “concepts do not occur without reference to other concepts, and many concepts occur as part of a structured domain” (p. 77). Thus, a measurement-based determination of identity could be accurate in the context of a domain but not exportable to different settings.

While the apogee of a category is emphasized in prototype theory, to understand uncertainty we must consider characterizations of edges, including fuzzy or vague boundaries. Varzi (2016) notes that philosophical considerations of boundaries offer three primary views, one epistemic, one ontological and the other linguistic. In the first account, one does not know where the edge lies. In the second account, one declares that there is no demarcation, natural or otherwise, between one thing and the other. The third account suggests instead that there is a line that simply has not been declared. It can also be helpful to consider contrasting views of the nature of the edge itself. Varzi points to two primary views of edges, the bodiless and the bulky. In the first case, following Aristotle, borders have one fewer dimension than the object they bound. That is, a three-dimensional object has a two-dimensional edge, and so forth. In this case, there is no substance to this demarcation. In the alternative view, an edge consists of a thin layer, which can be seen as an extension of the object itself. This view allows us to speak of such ideas as “scratching the surface.” We can imagine wider boundaries, thicker surfaces abutting one another, creating a zone between things containing their shared characteristics.

Category boundaries are negotiable through use of language. Lakoff (1973) illustrates how we use hedges, words and phrases, such as *very*, *a kind of*, *a regular*, or *rather* that modify the content

of a term, allowing us to signal partial category membership. In his development of fuzzy set theory, a mathematical approach to category membership, Zadeh (2008) describes indeterminate identity as a product of “imprecision, uncertainty, incompleteness of information, conflicting information, partiality of truth and partiality of possibility,” which he calls “environments of imperfect information” (p. 2753). These environments are conceptualized as having characteristics of materiality or geography, with one category abutting the territory of another with a border between. Fuzzy set theory allows partial membership in categories by assigning levels of certainty on a scale from zero to one, so that related but non-identical entities can be understood in relation to one another.

Like uncertainty, vagueness as a term associated with ambiguity is subject to definitional challenges. That is, one cannot readily illustrate vagueness without employing vagueness. In an overview of vagueness, Eklund (2007) divides it into three primary types: borderline cases, lacking of sharp boundaries, and sorites susceptibility. These definitions tend to relate back to the previous conceptions of boundaries, leading Eklund to wonder: is vagueness its own characteristic, or is it merely a signal of undefined tolerance? Sorensen (2016) highlights that in borderline cases, one is seldom certain where uncertainty begins, making vagueness vague. While the terms *vagueness* and *uncertainty* are often used synonymously, Sorensen, working from a philosophical perspective, makes a distinction between vagueness and ambiguity, stating that the former is intrinsically vague and cannot be readily resolved, while ambiguity is an issue of multiple meanings, which can, through language, be resolved by pointing to the intended meaning. This view is shared by Empson (1966), a literary critic whose exploration of different types of ambiguity in use of language defined uncertainty as a form of ambiguity in which synonymy is at play. Unlike Sorensen, however, Empson suggests that resolution might not be possible or desirable.

The field of psychology treats uncertainty as a general term to express what Zadeh (2008) might have called environments of imperfect information, while vagueness and ambiguity are distinguished in a different manner than seen in philosophy of language. Molden and Higgins (2004) note that vagueness is characterized by a weak relationship or fit between a term and a set of characteristics, while ambiguity is characterized by an abundance of dichotomous information about a term and characteristics. Determining membership in each of these cases presents challenges, in one case because one cannot quite draw the connection (it feels like a stretch), in the other because it could be easy to make an incorrect or false connection. In both philosophy of language and psychology, vagueness is associated with inadequate information, while ambiguity entails an abundance of information. Resolving ambiguity, then, may not be possible through the provision of more information, either linguistic or technical. This view is shared by Hayes and Halpin (2008) in their consideration of ambiguity from a computer science perspective. Discussing Uniform Resource Identifiers (URIs), they note that more referents create more chaos and confusion—overspecification does not lead to clarity. Ambiguity in this setting is associated with both paucity and excess.

Working in cognitive psychology, Kagan (2009) considers emergent categories as conceptual novelties, “events that alter one or more features of a schematic prototype or semantic network stored in long-term memory” (p. 293). He notes that our most common impulse when engaged with novelty is to categorize. Kagan’s approach employs brain scans rather than prototype research, which leads to different conclusions about the role of novelty or uncertainty in our understanding of categories. Rather than emphasizing claims about membership inherent in objects or categories, this work emphasizes personal perspective as a determinant of categorization and explains a process of marginalization when events or objects encountered are described by people for whom they serve as conceptual novelties.

Understanding identity is central to any consideration of representation, yet the language and ideas associated with it are so messy that it is difficult to set a clear definition of what it means. Identity can be seen as both the unique totality of an item and the characteristics it shares with other items. While cataloging objectives separate these two perspectives, classification requires that we consider them together to understand how each item is related to others in its universe. The ways that we describe identity will always be less than complete, thus prone to underrepresentation or misrepresentation. The limitations of proxies that cannot fully represent identity give rise to consequences ranging from confusion to exclusion. While the harms of marginalization are well documented, the outcomes of uncertainty may be more diverse and depend to some extent on how this uncertainty is characterized. Different disciplines, from cognitive science and philosophy of language to mathematics and computer science, provide a range of approaches to understanding (and sometimes resolving) these issues. By asking what is meant by uncertainty, vagueness and ambiguity, we may find ways of noticing challenges in the act of representation as well as in the interpretation of descriptions.

2.6 Design in KO

How do we approach representation given the myriad issues I have outlined above? Our options for determining identity and creating descriptions are guided by standards, protocols and technical systems such as collection management software. To change how we represent things, we have to change these layers of infrastructure in some way that improves their use and does not cause failure of part or all of these systems. Several scholars in KO have argued that both development of these systems and the work of cataloging can be seen as design. Arguing that librarianship is more of a design discipline than a social science, Clarke (2018) demonstrates how roles ranging from cataloging to reference interviews exhibit a design epistemology present in the field. Design methods have been used to explore a range of issues related to KO, inviting practitioners to engage in novel descriptive practices that highlight diverse perspectives on collections (Feinberg et al., 2013; Feinberg et al., 2017). These projects illustrate alternative approaches to the practices of cataloging

that might be able to capture some of the aspects of identity that are commonly ambiguous, uncertain or marginal in most catalogs.

Several design scholars and practitioners have considered the role of ambiguity as a feature of user experience. While a tendency remains to eliminate the discomfort it can provoke, some attention has been given to its possibility as an affordance. In a variety of unusual experiments, Gaver (1999, 2003) has introduced ambiguity to invite participants to engage with designed objects or create design responses. Where ambiguity is understood as an experience that creates barriers or slows things down, we may view it as related to friction, which has been explored by a variety of designers as a means of creating opportunities for reflection (Cox et al., 2016), generating novel and pleasurable experience (Hassenzahl & Laschke, 2015) or even increase engagement (Korn & Volda, 2015). While it is not always clear whether ambiguity and friction are the same thing, ambiguity introduces friction into experiences. I have adopted both of these framings through my work as a means of refining my understanding of ambiguity as related to and part of other difficulties in representation. My work views the creation of representation rules and tools, as well as the task of cataloging, through the lens of design, whether or not the practitioners involved employ explicit design methods.

2.7 Taxonomy of Ambiguity

In this chapter I have considered a range of perspectives in KO and beyond on the meaning of ambiguity and the task of disambiguation. From these perspectives, I developed a simple taxonomy of ambiguities so that I could attend more readily to the variety of sources and consequences of friction that arise in description (Rajan 2017, 2018). For each of these types, we might see a range of different sites or sources. Their consequences and potential ameliorations are what constitute the category rather than any clearcut characteristics of the items. Some items might be fraught with multiple forms of ambiguity. This taxonomy is not offered as a classification scheme outlining mutually exclusive categories but as an aid in noticing the bumps in the terrain as an item is described. None of these types are inherently good or bad. The responses evoked when we encounter items that have these kinds of challenges can and should be varied. The first two types, simultaneity, and uncertainty align with common characterizations of ambiguity. The third type, residuality, points to conflict with the logics of structured description, while the fourth, strategy, attends to conflicts between systems of description and those who might be described.

2.7.1 SIMULTANEITY

Simultaneity describes difficulties in representation due to the presence multiple valid identities. Ambiguity that presents as simultaneity is primarily the effect of rules regarding classification or assignment of subject headings, rather than any critical feature of the entity being categorized. Some classifications and subject headings, however, imply binary logics that might

render a complex simultaneous identity as nonsensical or impossible. The description of an item with simultaneous or complex identities will be partial and thus not fully accessible. While allowance of multiple identity statements might allow for saturation of the topics and thus representation in the catalog, the relationship between these identities may remain ambiguous to the user. Catalogers who face challenges such as this, as in describing multi-genre anthologies, must make a compromise in accordance with their anticipation of user needs. A new approach for describing simultaneity would have to allow not only for multiple identity statements but for specification of how they relate to one another.

2.7.2 UNCERTAINTY

For Otlet (Frohmann, 2004; Rayward, 1997), and Bliss (1933), and Ranganathan (1967), knowledge was unitary, and disambiguation was, primarily, the work of determining to which subject a item belongs. Ambiguity was merely insufficient understanding on the part of the classifier. Ranganathan also pointed to user experiences of uncertainty as a problem of under-specification. Wilson (1968) warned that overspecification could produce similar problems for the user, who might not discover or engage with an item that had been very narrowly defined.

Other forms of uncertainty on the part of the person doing the description work may stem from the context and conditions of the materials being described. Fragments, for example, may produce limited understanding, as would damaged or corrupted items. Missing historical context could also hinder one's ability to name or describe a thing. In scientific description especially, the newly observed or emergent is a frequent source of uncertainty, as the community waits to amass enough observations to verify a phenomenon. These cases where contextual information is required may be dealt with in domain-specific ways, suggesting that ambiguity is only a problem when one tries to do universal classification.

Uncertainty might also be understood as an issue of warrant. While literary and educational or scientific warrants have been called upon in the determination of subject since the advent of bibliographic classifications schemes, more nuanced approaches, including cultural and ethical warrants, have expanded our understanding of what it means to look for evidence of a subject (Beghtol, 1986). Uncertainty when considered in relation to warrant might be seen as a problem of calling upon a limited or limiting warrant without invoking the framework of a supplementary form of warrant.

These varieties of uncertainty have similar consequences in description, in that a record created from a state of uncertainty is likely to be only partially representative of the identity of an item, and could be a misrepresentation. Attending to the rules of the given system of description allows the cataloger to create descriptions that might hold up in the context of that system, but it remains difficult to mark where or how uncertainty was experienced. While resolutions such as

domain-specific representation can reduce uncertainty, the experience and knowledge of the cataloger will always be variable and, at times, uncertain. Thus, the resolution of uncertainty in the catalog might be twofold: one could wish for increasing certainty on the part of the cataloger, through more experience or introduction of supplementary rules to guide the process of identity determination. We might also imagine having some way to flag records to indicate their limitations and signal that they might be worth revisiting in the future.

2.7.3 RESIDUALITY

Simultaneity and uncertainty vex descriptive practice but might be handled by attending to the rules of representation. As confusing as they may be, they assume a stable identity of the item, which could allow for resolution through further marking the sources of ambiguity in a record. *Residuality* is the term that Star and Bowker (2007) use to describe things and phenomena that defy fixed description, usually due to fluctuating changes in identity based on time or location. The nature of this kind of ambiguity lies largely in the limitations of our systems, which require succinct and stable descriptions.

Representations of items that are affected by residuality misrepresent identity by presenting only a snapshot of one expression of identity. In addition to limiting access, they reify the not-fitting. Like simultaneity, the technical resolution of such ambiguity might take the form of more complex and multiple identity statements, with the ability to articulate how and when the different facets appear and fade. A more useful approach, however, might be something narrative in form, as seen in archival description. Although such statements might limit some forms of access, the representation might be more accurate.

2.7.4 STRATEGY

Some forms of ambiguity may be intentionally deployed by individuals and communities for a variety of purposes. For example, Indigenous knowledge scholarship highlights the rights and responsibilities of communities in relation to knowledge (Duarte and Belarde-Lewis, 2015; Glass, 2015). Restriction in access to information can be understood as a form of resistance and protection that runs counter to most Western conversations around access. These approaches are more commonly practiced in archival or museum contexts than in bibliographic description. From these perspectives, ambiguity may be seen as that which you do not have a right to.

Other forms of strategic ambiguity may include cases where privacy is sought (Nissenbaum, 2004), where systems are not trusted (Simpson, 2007), or where a false identity is deployed to facilitate access to some resource. Ambiguity as strategy challenges the central values of most representation systems by including identity statements that could be not-true or non-existent. In

these cases, we might consider what resources are advocated for by the identity claimed. While the term false identity has negative connotations and can be malicious, deployment of false identity may sometimes allow for collocation with resonant materials.

In some cases, strategy as a form of ambiguity could be resolved by development of trust with the individuals or communities responsible for offering identity statements, especially when self-representation is allowed by a system. To develop trust, however, the concerns of those involved would need to be considered in the final forms of description. To this end, some institutions have developed relationships with communities associated with items and allowed for their description or redescription in accordance with community needs, which in some cases maintained forms of underdescription for broad audiences, in order that community knowledge remain protected (Glass, 2015).

2.8 Conclusion

In this chapter, I have provided an overview of the ways that ambiguity might be discovered, characterized, and addressed in practices of description. While the purpose of cataloging since its origins has been to inventory and facilitate access to items in a collection, our understanding of the claims of representation have evolved from realist to situated. Regardless of theoretical views on the identity of items or the nature of subjects, one of the primary goals of cataloging is to disambiguate each item from others both within and outside of a given collection. While disambiguation asks us to determine what distinguishes an item, little attention has been given in this field to what constitutes ambiguity, which has been treated as a temporary state resolved through correct description.

Critical perspectives on KO highlight the subjectivity of bibliographic description and call attention to the reifying powers of these systems, asking us to consider the harm that can be perpetrated through use of vocabularies and structures that are often treated as neutral or natural. While ambiguity is not explicitly explored in these discourses, related concepts tend to emphasize the risk of marginalization, invisibility, exclusion or exploitation, though some scholars invite us to imagine systems wherein other approaches to representation are possible, some of which might include different attitudes toward ambiguity.

While ambiguity may be produced by our description systems, it may also inhere in the conceptual process of identification. A tension between uniqueness and membership as central to identity may be a source of ambiguity: is a cataloger paying more attention to the aspects of an item that are different from every other, or to those characteristics that are shared by other items in a collection? A single item might be represented differently depending on one's approach. The challenge of making sense of a thing is often associated with uncertainty, which itself may take on a variety of contours. An initial attempt at disambiguating ambiguity, offered here as the taxonomy of

ambiguity, informs the design of this research project, expanding beyond uncertainty to allow us to ask where and why it is present in description systems. Such findings may have implications for the design of the rules and tools of representation.

3 Research Methods

3.1 Introduction

This work explores ambiguity in description systems, asking what it is other than the moment before things are disambiguated. This chapter contextualizes my research questions in relation to the pragmatic field of KO, then lays out the research design for this investigation of ambiguity, which had two phases. In the first phase, I performed an archaeology of descriptive practice in CHIs. Mapping the strata of the field allowed me to consider multiple sites, causes and consequences of ambiguity. To understand how these strata shape description, I created a model of the temporal process of representation, which aided me to asking how practitioners navigate the strata of descriptive practice in their work. I then extended the taxonomy of ambiguity introduced in Chapter 2 through a reflection on my own experiences describing identity. In the second phase, I interviewed practitioners who represent items in collections or who design infrastructures for description, asking how they notice and handle ambiguity in their work.

While concepts of identity and representation can be abstract and idealized, the work of description and cataloging is deeply pragmatic. By illuminating a wide range of issues that make disambiguation difficult or impossible, I hope to contribute to the improvement of our systems and practices.

3.2 Why Disambiguate Ambiguity?

The goal of this study was to extend our ability to notice and discuss the challenges and limitations of doing representation work in description systems. In addition to documenting what I found in this research, I offer tools that allow future researchers and practitioners to extend this line of inquiry. The findings of this study are not offered as a generalizable statement on the field of practice but as a reflection on the challenges and possibilities of this work.

3.3 Origin of a Question: Miscellany, Otherness and Ambiguity

During my studies for my master's in library and information science (MLIS), I was drawn to KO, a field concerned with the challenges of description I had been preoccupied with most of my life. In classification theory, I found a set of systematic questions and pragmatic solutions to the problems of categorization. I was not always impressed with the way things were handled, but the fact that such a discipline existed was heartening. I wanted to know what it left out, how it failed. I

undertook an independent research project that asked: what ends up classified as *miscellaneous* or *other* in the library catalog? The project was short lived, as there was little to find, just a few books buried in call numbers that signaled the long tail of classification schemes. These books were deeply embedded in surrounding context that would render them discoverable, if underdescribed.

Although I didn't articulate it at the time, I imagined the classification scheme as passive assigner of identity and status that was unable to make sense of the defiant books and other media that it would ingest. My mental model of classification imagined the assignment of class as an automatic and automated process with no one there to intervene. Finding few miscellaneous volumes in the catalog, I belatedly recognized the work of catalogers whose job it is to render items discoverable. Their dedication to this task would, most of the time, result in items being pragmatically assigned somewhere. Even if they had encountered difficulty in the process, they would describe an item to the best of their ability; their doubts would never show up in the record.

Realizing that no such cache of odds and ends was available, I turned to the rich literature that was already discussing the failures of these systems, detailing the ways that classification marginalizes some subjects and identities, from women (Olson, 2008) to Asian-Americans (Higgins, 2016). Critical KO scholars pointed out many ways that power is enacted in the catalog, privileging particular points of view. They demonstrated that some subjects and their related materials become invisible, othered or pathologized due to misrepresentation, underrepresentation, or inappropriate associations (Adler, 2016). This scholarship addressed the harm of misrepresentation, usually in the context of human identity. I did not disagree with these assessments but wondered whether such issues could also be found in cases where human identity was not clearly at play. Further, I was curious whether it was possible to think about the challenges of representation not only in terms of harm, but of possibility.

As I began my doctoral research, I reconsidered my framing of the margins of description and classification. Rather than look in one place (the terminal end of a class) or for one type of challenge (human identity), I would ask the broader question: What makes some things difficult to represent in these systems? A primary goal of bibliographic description and other forms of cataloging is to disambiguate each item, distinguishing each item in of the collection while grouping them according to their shared characteristics. The literature of classification theory and cataloging practice advises us to resolve ambiguity through precise techniques, yet no unifying language exists to describe the challenges that we face along the way. Ambiguity is treated as any source of temporary uncertainty, its primary characteristics inaccuracy and inefficiency. It seemed worthwhile to spend some time asking what and where ambiguity is in the process and practice of description. Having arrived at the language and framing of ambiguity, I once again went looking for what might be hard to describe, whether or not it appeared ambiguous once entered in the catalog.

3.4 Why KO?

While there is plenty to critique about universal bibliographic classification schemes, the theory and practice surrounding them articulates a comprehensive consideration of how and why identification and representation matters. While other classifications give order to some slice of the world, such as flora or human disease, bibliographic classification attempts something more immense and outrageous. It tries to provide a map for ordering all possible subjects associated with existing documents, as well as allowing for future expansions when and where changes occur in our understanding of subjects and their relationships. Rather than relying on purely abstract conceptual relationships, bibliographic classification and cataloging considers what it means for subjects to be embedded in materials and offers guidance on how to engage not only the conceptual contents of any given document, but their physical attributes and relationships to other materials in the world. Multiple layers of analysis guide cataloging work. Bibliographic description is intended to represent the most salient features of an item. The very rules that ensure the rigor and usability of a description, of course, are a source of frustration when they contribute to misrepresentation or invisibility. If something is ambiguous in a catalog, it is critical to ask what aspects of the descriptive process may have rendered it so. If, in fact, its ambiguity lies outside of these rules and tools, then perhaps it is worth exploring what that means and why it could be important in our considerations of representation.

Having embraced the scaffolding of bibliographic classification both for its clarity and its absurdity, I retain the pragmatic commitments of the field. My work aims to expand our vocabulary for discussing the challenges of representation work, rather than to make generalizable claims about the way that this work is done with a particular tool or institution. I began with a theoretical interest in what it means for something to be ambiguous, whether that ambiguity led to misrepresentation, invisibility or some other outcome. My commitments have been shaped by theorists such as bell hooks (1989) and Gloria Anzaldúa (1987) whose explorations of the margin has offered a language for understanding various kinds of liminal existence and identity. While such work is enriching and useful in thinking about the limits of representation systems, the pragmatic aims of this field invite critique that is actionable. It has been important to me to explore this topic through the insight of practitioners, with hopes that my findings aid them in some way. The methods I have used in this work have allowed me to explore what ambiguity can mean in representation contexts. It has also been an opportunity to explore how sharing new frameworks and vocabularies can scaffold generative conversations about abstract topics.

3.5 Research Questions

This research treats ambiguity as both a challenge and a possible opportunity in and for representation practices. To investigate, I ask the following:

RQ1. Where does ambiguity arise in description systems?

- 1a. How do stakeholders talk about it and what do they do about it?
- 1b. How is ambiguity described as limiting and/or liberating by people across contexts?

RQ2. What factors lead to ambiguity in description systems?

- 2a. How do the requirements of standards, classification systems, and other infrastructures scaffold professional approaches? What are the limitations of these scaffolds; where do they break down?
- 2b. How do the resource allocation goals of a system affect whether something is rendered ambiguous?
- 2c. How do issues of trust between communities play a role in the ambiguity of some descriptions?
- 2d. How does presence or lack of contextual information lead to the ambiguity of some descriptions?

RQ3. How might we gain insights around ambiguity in these systems to better serve stakeholders?

- 3a. What relationship does description have with observation?
- 3b. What forms might these insights suggest?

These questions evolved through this investigation, sometimes expanding or collapsing, but always guiding my attention to the broad contexts of representation through structured description that produce or surface ambiguity. While I have provided responses to them in this work, not all were fully answerable.

3.6 Methodological Commitments: Pragmatism in KO

The field of KO attends to the practical development and application of conceptual systems that do work in the world. Theorists and practitioners have championed different goals and approaches, but all have evaluated their projects in relation to their utility. For Ranganathan, questions about the nature of distinguishing concepts inspired a faceted approach to description that allowed multiple perspectives to come together to form a whole. His system, with precise rules and schedules, allows practitioners to build faceted classifications that are efficient, yet nuanced and specific. Other bibliographic classificationists have contemplated the wobbly world of concepts in service bolder goals. Both Bliss and Otlet were concerned with the future of the world in the wake of

WWI and believed that a perfect information system would allow for perfectible human knowledge, eliminating strife that arises from ignorance. Other theorists have focused on the practical challenges of representation work, from Wilson's consideration of bibliographic control, to Hjørland's work that calls for contextualizing representations within domain. Critical scholars and practitioners invite us to recognize and address the reifying powers of description.

Organizations such as the International Federation of Library Associations and Institutions (IFLA) and the American Library Association (ALA) introduce conceptual models and representation standards that shape how this work is done. The field has always balanced the abstract nature of defining concepts with the technical work of describing items. Highlighting the pragmatic history of the field, Dousa (2010) suggests that critique that does not recognize the technical realities of the work may not be relevant to the field. Thus, while perspectives from other disciplines, such as the highly influential work of sociologists Bowker and Star (1999), may extend our understanding of the consequences of this work, they do little to address how change is—and is not—possible.

3.6.1 PRAGMATISM AND STANDPOINT THEORY

This research seeks to understand and contribute to the work of catalogers and others who engage in representation work in description systems. I take a pragmatic view of the role of language in evaluating representation in systems. Rorty (1982), for example, suggests that it is not possible to separate “descriptive” from “evaluative” terms; terms must contain both of these features to facilitate any action. My work asks, then, what forms of evaluation are being called into the descriptive work of practitioners. While critical scholarship can and should shed light on challenges that are not easily resolved, I have attempted to develop tools that allow us to develop greater sensitivity to these challenges. In its most common sense *pragmatism* favors maintenance or incremental transformation of things as they are, but it can more simply signal the possibility that something can work. It is this later definition that I embrace in this project. While my work may suggest small changes to existing systems, it may point in directions that would seem to subvert or hobble aims of maintenance.

I am interested in exploring the perspectives of participants throughout the representation process, including items themselves. By giving attention to ambiguity—that which is supposed to be eliminated from information systems—rather than to disambiguation, I ask not only why ambiguity is present, but what it might offer. My work in this way aligns with the concerns of scholars who ask us to consider the perspectives of the marginal as valid (Harding, 1991; hooks, 1989; Nakata, 2007). I am interested in the possibility that ambiguity in some cases may be central to identity—a notion that might seem anathema to many perspectives in KO.

3.6.2 RESEARCHER STANDPOINT

This project was born out of personal experience with and interest in ambiguity beyond the context of information systems. As a mixed-race woman, I have often been unable to represent myself clearly in both social and technical systems. Aware of my desire to articulate both the hardships and joys of my experience, I have not attempted to be a neutral observer, but to be a curious and reflective one. By deeply engaging with the literature and practice of the discipline of representation, I have found myself surprised, confused, doubtful and confident throughout this project. My perspective is more fully articulated in Chapter 5.

3.7 Methods: Reflective Approaches for Messy Questions

Because this project asks what ambiguity means in the context of the discipline of KO, it requires a qualitative approach that allows me to explore both the discourses of the discipline and the practices of practitioners (Patton, 2014). Further, as ambiguity is not a clear and bounded concept, I have employed methods that allow me to both capture its presence and allow for its messy contours. Retaining ambiguity runs counter to common definitions of rigor, requiring that we “find ways of knowing the indistinct and the slippery without trying to grasp and hold them tight... through techniques of deliberate imprecision” (Law, 2004, p. 3). Pointing to the difficulties of making sense of the ambiguous in research, Law notes that, “to shoehorn non-coherent realities into singularity by insisting on direct representation and Othering whatever does not fit is...to miss the point” (p. 93). My methods attempt to capture both fitting and not-fitting.

3.7.1 MAPPING THE TERRAIN OF DESCRIPTION THROUGH ARCHAEOLOGY

I begin by mapping how the discipline of description creates the conditions for fitting, employing the Foucauldian method of archaeology. Described by Alvesson and Sköldbberg (2009) as a method that “disregard(s) the truth of statements as well as their (deeper) meaning— to map out the overarching rule systems in the thinking of whole epochs,” this archaeology attends to the terrain of knowledge organization (p. 250). Drawing on a view of infrastructures offered by Star (1999) as regimes that can be technical and relational, I consider an interplay of standards, management systems, and disciplinary values that inform representation in description systems.

Through this work, I explore how ambiguity can emerge in the voids between ideals and practice. Which infrastructures inform representation, creating and limiting the possibilities of a description? Who creates these structures, who fills them, and who views the descriptions once they

are complete? What external considerations might be at play in the work of creating descriptions? This archaeology provides a scaffolding through which I can investigate how things do not fit. However, archaeology as a method is not oriented toward consideration of the futures of the systems examined.

3.7.2 REFLECTING ON AMBIGUITY WITH PRACTITIONERS

Turning toward current and future practice, I shift methods for the second phase of my research and consider the experiences of practitioners through a series of reflective semi-structured interviews (Roulston, 2010). Interviewing catalogers is a familiar method in this field, used to explore the ways that practitioners do and think about their work (Dobreski, 2019, Sauperl, 1999, Wagner, 2021). I invited practitioners working in a variety of institutions to share examples of times when they encountered challenges in deciding how to describe items in their cataloging work. In her observations of catalogers, Sauperl mapped the temporal process of subject assignment for bibliographic description. Focusing on a limited set of items and infrastructures, this work captured the cognitive processes of practitioners navigating standards. This study did not center on observations of work in progress, relying instead on recollections of past experiences. I considered practitioner examples of challenges as examples of both friction and ambiguity in an effort to refine my understanding of the limits of ambiguity and to highlight a wider array of difficulties in representation work.

Treating interview participants as reflective practitioners, a term introduced by philosopher Donald Schön (1983) to discuss the work of skilled professionals, I consider the moves that description practitioners and infrastructure designers make their work. Schön's approach is generally compatible with the questions central to Foucault's archaeology, considering individuals, communities, and a range of external contexts and constraints in trying to understand the work that designers do. Where an archaeology might treat the subject of research as having primarily historical importance, an analysis of reflective practice asks what is possible. Further, this reflective work considers the ways in which participants and the researcher are building shared knowledge.

3.8 Research Design

The first part of this project engaged with the theoretical and technical commitments of representation seen in literature of the field, while the interviews with practitioners required attention to data collection and analysis. I will discuss the methods of the archaeology first, followed by those of the practitioner interviews.

3.8.1 SITUATING DESCRIPTION

The first phase of my research contextualized descriptive practice through consideration of documentary evidence, in the form of disciplinary literature of KO, and analysis of the relationship between infrastructures that support the work. From this analysis, I created models that operationalize the work of representation and offer multiple conceptions of ambiguity. While these models helped me think about how we might look for ambiguity in description systems, they did not account for the possibility of ambiguity as a salient characteristic. Drawing from my own experience, I reflected in Chapter 5 on the possibility of such features and the implications for the design of description systems. The following sections outline the variety of projects I undertook to contextualize representation work.

3.8.1.1 Archaeology

Undertaking an archaeology of description helped me to address aspects of both RQ1 and RQ2 but most directly engages RQ2a:

2a. How do the requirements of standards, classification systems, and other infrastructures scaffold professional approaches? What are the limitations of these scaffolds; where do they break down?

Mapping the terrain of description in CHIs, I asked how strata of values, standards and management systems shape what is desirable and possible. Evidence of these strata were found primarily in textual documents, although my exploration of the terrain also included viewing videos that provided marketing information or training support in the use of tools used in representation work in CHIs. In addition to the literature of KO, textual evidence used in this archaeology came in a variety of forms including but not limited to trade association magazines and white papers; journal articles; books on the history of CHIs; codes of ethics and other policies employed by institutions; marketing websites and technical documentation for tools used in description; Twitter exchanges; blog posts; and documentation of standards.

As I attuned to the many threads in these overlapping discourses, it was not immediately clear how they related to one another or how collectively they could be understood as shaping description. It was also challenging to consider the discourses across CHIs. Beginning with the question *why describe?* I traced how collections are discussed as valuable to institutions, as well how particular values inform our understanding of what work a description ought to do. Looking beyond description, I sought to contextualize these values of representation in relation to the broader values of institutions.

Next, I considered the ways that standards used to support description are laden with their own values, which sometimes support and other times hinder enactment of institutional or professional values. Further, I noted the ways that some of these standards offer incompatible

solutions to representation issues. Finally, recognizing the role that software interfaces play in the construction of description, I considered these management systems as the layer of infrastructure that we interact with as the catalog.

Having identified these strata and their assorted goals, I described how enactment of two values in cataloging and CHIs more broadly, *access* and *stewardship*, are shaped by these infrastructures. By reflecting on two values that are sometimes in tension, I was able to highlight features of infrastructures that can cause friction for practitioners, whether due to technical limitations or ethical dilemmas.

3.8.1.2 Conceptual Model Building

This archaeology identified diverse discourses and infrastructures that shape description, but it was not clear how a practitioner describing an item might encounter or navigate them. Asking where ambiguity might be located in description, I developed an institution-agnostic model of the temporal process of description, which I call the chain of surrogation, included at the end of Chapter 4. Beginning with the item and ending with its description, I map this process as a chain that moves from the concrete to the conceptual before becoming concretized as a surrogate in the description system. In this process, the practitioner moves through and works with the values and standards outlined in the archaeology as they create a description in a management system. In addition to the cataloger, this model highlights the roles of several other participants. With this model, it became easier to ask where ambiguity might be noticed or experienced, and by whom.

Using the chain of surrogation, I am able to locate sites of ambiguity and can further describe their sources and implications through the taxonomy of ambiguity introduced in Chapter 2. These tools together shaped the next phase of this research.

3.8.1.3 Reflection on the Limits of KO

My own experience of living with an ambiguous identity was not reflected in any of the KO literature, nor could it be readily understood through examination of the infrastructures of description. Recognizing my embodied exploration of some of these research questions as germane to analysis of the limits of representation, I sought confirmation of my experiences of ambiguity as a salient characteristic of identification and, sometimes, as a liberatory experience.

To do so, I initially conducted a small study in which I invited six individuals who identify as gender nonbinary to discuss description systems. I was interested in the perspectives of people whose identity term directly contests the project of disambiguation. In these conversations, I asked how their experience of eschewing categorization was limiting and liberatory. To maintain focus on representation systems, as opposed to daily experience and use of expressive language, we looked at several examples of gender representation interfaces in information systems. I invited participants to

consider how the structures of limited questions do and do not serve the needs of those whose identity lies outside of the logic of most of these systems.

The results of that study are not directly discussed in this work, though I include the study design here and the interview protocol in Appendix A. I recognized upon conducting six interviews that an exploration of these interface designs was outside of the scope of this dissertation project. Moreover, in reviewing the conversations, I recognized that validation of my own lived experience could not be and did not need to be provided by comparing my conceptions of ambiguity to theirs. For reasons that I will briefly touch on in Chapter 5, I recognized that their approaches to navigating identity, while rich and liberating, were distinct from the approaches I discuss in this work.

I set aside my desire to seek proxies in other identities and continued this reflection without using their experience as evidence for my argument. I deeply appreciate the individuals who spoke with me about their conceptions of gender and representation systems and hope to return to consideration of the design implications of self-representation interfaces in the future. I recognize that pointing to data collected and left under-analyzed is contrary to most standards of research. Yet removing reference to this study eliminates all evidence of my desire to corroborate my experience and erases the role that these conversations, collectively, had on my ability to recognize my own rich history of contemplation as valid and valuable to this project.

In Chapter 5, I extend my taxonomy with a reflection on constitutive ambiguity. Drawing on literatures beyond KO, I demonstrate how ambiguity can be a salient characteristic and suggest that it may be seen as an affordance. Recognizing that retaining ambiguity is anathema to the pragmatic orientation of this field, I consider the advocative properties of representation and ask whether an orientation toward resource allocation rather than identity might allow us to design infrastructures that create more room for ambiguity without foregoing their function. This work supplements the models developed in the archaeology, extending the ways in which we might ask about experiences and potentially expand how we think about designing around, with or for ambiguity. In so doing, it addresses the questions of limitation and liberation in RQ1b, the issues of resource allocation in RQ2b, and both subquestions of RQ3, which considers the design implications of ambiguity.

3.8.1.4 Pilot Study: Representing Nonbinary Gender

As mentioned above, I undertook a pilot study early in my research which I elected not to continue due to changes in my research strategy. Nonetheless, these interviews did shape my thinking about this project.

For this compensated, IRB-approved study, I recruited participants online and through word of mouth, to participate in a one-hour Zoom conversation about identity and self-representation in

information systems. I sought individuals whose gender identity does not fit with notions of a male/female binary. This did not include individuals who identify as trans women or trans men but focused on those who may identify as trans but who reject claims of male, man, female or woman. Six participants signed up.

In the first half of the recorded Zoom session, I shared my own research questions and invited questions about the study, then invited participants to share how they think about gender and their own place in relation to it. I also asked about the history of their thinking about gender, and the concept of nonbinary in particular, as liberatory and/or limiting. In the second half of the conversation, I showed them an assortment of approaches to gender representation in information systems. All examples had been found in real forms. Participants were asked to respond to the construction of these forms, highlighting assumptions that they felt were made in the in the construction of options. Participants were not asked how they would use these forms to self-identify.

Each interview was transcribed and anonymized, with video deleted. Comprehensive analysis was not undertaken, though a general review of responses to the information systems was noted.

3.8.2 CAPTURING PRACTICE

In the second phase of this research, I asked how practitioners notice and address ambiguity in their work. After introducing the general design of this study, I will provide details about the setting, participants, data collection and analysis methods. The findings, shared in Chapter 6, address all of my research questions, primarily through the framing of RQ1a, which asks:

How do stakeholders talk about it and what do they do about it?

I had considered shadowing practitioners to see what challenges arose in their work but was prevented from doing so by the Covid-19 pandemic. Instead, I interviewed 19 individuals doing description work in CHIs during 90-minute Zoom sessions. Although I wanted to see how they make their moves, it made little sense to provide them with artificial scenarios to navigate. Instead, I used the chain of surrogation model and taxonomy of ambiguity to guide interviews. These conversations were focused on the interviewee's experiences of challenging cases they have encountered in their work. The research question was reframed as a prompt: *What made it difficult to do the work of representation?* Viewing participants as reflective practitioners, I asked what moves they made (or would have liked to make) when encountering ambiguity or similar challenges in their work. I also interviewed two infrastructure designers, asking how they think about the goals of their work and how they conceive of ambiguity. These designers usually are not facing the particulars of any collection but are responsible for the infrastructure that will support future representation.

3.8.2.1 Setting

This research was undertaken during the Covid-19 pandemic. As a result, the interviews were conducted over Zoom. While doing research in this setting necessarily limited the kinds of activities that were possible, conducting remote interviews allowed for a wider range of participants across geographical settings. Interviews were on average 90 minutes long. Most participants were interviewed just once, with follow-up email discussions as needed. The infrastructure designers were interviewed twice each. As the lockdowns eased, two local practitioners invited me to come watch them work on site. As an invited observer, I did not structure these one-hour visits during which I observed as they cataloged an item.

The social and political moment in which this research was conducted, during a global pandemic, major U.S. elections, massive wildfires in the western US, social upheavals (particularly around racial justice), and increasing moves to restrict the rights of trans people, likely contributed to the questions and concerns voiced by research participants. All systems bear the marks of the moments in which they were conceived and implemented. Capturing the state of mind of practitioners in a turbulent era may highlight the concerns unique to the time. Their considered responses, however, capture a deep commitment among professionals to the long view, anticipating moments other than the present.

3.8.2.2 Participants

This project primarily attends to the experience of practitioners who create representations of items in description systems. There is also consideration of the role of infrastructure designers and discussion of the experiences of end users. The participants in this study often occupy multiple roles, as practitioner-users, or designer-users. I focused my analysis primarily on their most prominent role in relation to the information systems in question.

Most interview participants included in this research worked in library, archive or museum settings as catalogers, archivists, or metadata librarians. These individuals were recruited online and via word of mouth, through an invitation to talk about their experiences working with items that were difficult to describe or represent. My recruitment efforts yielded responses from two practitioners whose roles or institutions stretched my expectations of CHI description. Since this study does not aim to offer generalizable statements about the practice of representation, I included these unusual cases in my research, which added richness to my exploration of how ambiguity might be noticed and handled in description systems. A full table describing participants is included in Appendix B.

Of the 19 individuals interviewed, nine worked in libraries, six in museums or other object-oriented institutions, three in archives, and one in a corporate setting. Several had experience in

institutions and with collections other than those they worked with at the time of our conversations; examples from prior experience were often woven through the interviews. Some practitioners had multiple roles, such as the librarian for an art museum, who I included as a museum practitioner due to the range of materials and unique approaches to description that were part of that work.

Most participants worked in the US, while one worked in the UK. Experience levels ranged from less than a year, with no formal training, to decades of work experience and engagement in the profession. The first practitioner with an unusual role was C1, a manager of digital assets for an education company. The second was M2, who was developing a metadata strategy, including a CV, for the illustrative elements of a digitized 16th-century codex. With a background in art history and fluency in the languages included in the original document, they were attempting to provide access to the meaning of a variety of different images, both in the original languages and in English translation.

I also interviewed individuals working on infrastructures that support representation work. Both designers were introduced to me by people who knew about my research. The first designer worked as an editor for a bibliographic classification scheme and for a subject heading list, and had experience as a cataloger in academic libraries. The second designer worked for a large institution and was focused on adding pronoun representation to the institution's identity management system. This participant's perspective focused on the technical challenges of implementing a representation system in an IT context, with focus on the relationship between their pronoun project and related challenges in identity management approaches. Other practitioners I interviewed also had experience designing infrastructures to support representation work, and their comments about those tasks are considered in my analysis.

3.8.2.3 Data Collection

This research study was IRB approved and all participants have given their consent to participate. Each of the interviews with practitioners and designers undertaken on Zoom were recorded for transcription. After transcription, audio visual (AV) files were separated, and video recordings were deleted. Audio files were retained for review during analysis. Transcript were anonymized and saved under the code name given to each participant.

Interviews with practitioners were semi-structured. At the beginning of each, I introduced my work and asked about the role and experience of the practitioner. I then introduced the chain of surrogation model to establish a common ground for talking about the many aspects of description work. Practitioners were invited to ask questions, share comments, or consider examples of their own experience in relation to his model. Next, I introduced the taxonomy of ambiguity, which usually prompted practitioners to share more examples. They were also invited to share their responses, whether critical, illustrative, or expansive, to both models.

In the second half the interview, I invited them to share any examples of ambiguity or friction that had come up in their work. These conversations were often expansive, addressing both examples of items that were difficult to work with and ongoing challenges. Topics included the tools and infrastructures of practice, relationships with end users, the role of professional community in shaping work, and institutional priorities. I invited participants to send an email if they had any further questions; two sent brief messages elaborating on something we had discussed. I wrote brief reflection memos after each interview

As the lockdown measures eased, two local practitioners invited me to visit them on site. Although I had not anticipated this opportunity in my original research design, I accepted the invitation as chance to better understand the workflow in relation to the chain of surrogation. Each visit was approximately one hour, and I did not structure the visits. In both cases, the practitioners demonstrated their process for doing original cataloging of an item in their queue. Neither item was selected for being obviously ambiguous, though frictions arose in the process of representing both. I asked each practitioner to talk aloud through their process, highlighting what aspects of both the items and the management system they paid attention to at each stage, and took notes on paper. These field visits were not analyzed in my findings but informed my understanding of the process.

Interviews with designers were, like those with participants, conducted and recorded on Zoom, but were more open-ended and took place over two sessions. While I did share my work, these open-ended conversations attended mostly to the details of their work. In each case, I sought to capture what roles—and related goals—they had, what upstream constraints shaped their work, and how they thought about the downstream consequences of their designs.

3.8.2.4 Data Analysis of Interviews

Each interview recording was transcribed using Otter.ai. Listening to verify the transcription, I manually cleaned up the resulting transcripts and anonymized any identifiers. Over the course of several months, I listened to each interview at least twice while reading the transcript on a computer or on paper, and at least once while away from the text, as I walked. Listening to participants multiple times before coding allowed me to engage more openly and to notice ideas they surfaced that I had not considered in the development of my models. After listening, I made notes to highlight major points before engaging in further analysis.

Using methods of thematic analysis, I considered not only the examples that individual participants shared, but how their stories collectively illustrate tensions in the profession (Braun & Clarke, 2021). Having listened to interviews multiple times, I began manual qualitative coding of transcripts on paper. The models which structured my interview, the chain of surrogation and taxonomy of ambiguity, provided an initial set of codes. Many of the examples of friction or ambiguity shared by practitioners were offered in response to these models, but others were less

explicitly signaled. Across all 19 interviews, I highlighted 253 examples of challenges in the work of representation, the sources and scales of which were variable. In addition to this set of potential ambiguities, I highlighted 144 examples of interventions that practitioners made. I also paid attention to how practitioners talked about the purpose and users of their work, the tools used to shape it, and the values they considered most critical to uphold in their descriptive practices.

Having gathered this initial set of examples into a collection of spreadsheets, with transcripts in hand, I conducted another round of coding, asking where these examples might be located in the chain of surrogation and which type, if any, of ambiguity they might suggest. For the interventions, I marked the site of intervention. In addition to these challenges and interventions, practitioners had shared many other interesting reflections on the practice, which I brought together in a spreadsheet as a separate set of notes.

The resulting set of coded examples highlighted differences in challenges across institution types and invited me to reconsider my framing of some forms of ambiguity. I oriented my analysis using the models previously introduced, modifying and amending my original conceptions of each. While scholars such as Sauperl (1999) have mapped the cataloging process by observing practitioners in action, this work relied on self-reported anecdotes about issues that have been challenging. Therefore, my analysis of these interviews attends to the themes of friction and ambiguity but does not make generalizable claims about how practitioners address them. Taking a design perspective, I invite the reader to view this analysis as a set of generative prompts for thinking about how we might design for and with ambiguity, both in infrastructure development and in the creation of descriptive records.

3.8.2.5 Representing Research: From Dissertation to Zine

This dissertation is accompanied by a zine, which invites readers to explore the themes of this project through a series of activities about observation and description, which can be found in Appendix C. Several of the activities in this supplementary publication were developed for a class I offered for Informatics students, which focused on observation for creativity. While the class did not directly engage with questions of ambiguity, I developed a method of *slow categorization* that invited them to notice and describe blurry edges and questions. This dissertation does not propose design solutions for issues of ambiguity, though it does signal some potential avenues for exploration. Through this activity guide, readers may find themselves experimenting with interventions of their own.

Although the limited format of these research interviews did not allow for any creative experiments with participants, design research methods, especially experiments in designing with ambiguity offered by Gaver et al. (2003), inspire my reflection on these findings. Other frameworks, such as the notion of ontological design offered by Escobar (2009), ask how worlds might be

reimagined to allow the excluded to find possibility rather than marginalization. While these approaches depart from the pragmatically technical world of the practitioners whose work is the focus of this research, bringing more radical questions to bear may provide new ways of thinking about the most challenging cases.

3.9 Conclusion

In embarking on the research adventure that has become this dissertation, I hoped to find out what it means for something to be ambiguous in the world of representation. I recognized that to think and speak clearly about this, I would have to be as concrete as possible. The great irony of this research is that in order to focus on this blurriness, I had to disambiguate ambiguity. This required attention to both the language and the processes of description. The methods of this project allowed me to stabilize the field so that I could notice ambiguity not as constantly shifting relativism, nor as the smudge of error. Moving beyond the theoretical, my interviews with practitioners and designers allowed me to reflect on the realities of how these issues play out in representation and to imagine how changes in infrastructure and practice might allow us to work with—and perhaps even for—ambiguity.

4 Archaeology of Description

4.1 Introduction

Description highlights salience. A novel is a series of descriptions. As material and emotional foci shift across pages and paragraphs, the form of description changes. The author directs our attention to the current important thing. Together, we understand these descriptions as the story.

Description in cataloging is a comparatively rote representation of what is present. Each is the surrogate of an item, rendered in a standard form by the scaffolding infrastructures of standards and software systems. The differences and relationships between descriptions can be read as the story of the collection. The story is rendered legible by the care with which each item is disambiguated, described as both unique and as related to the rest of the collection.

While structural constraint is a central feature of catalog description, the ways in which different institutions think about and use features of description allow for different approaches to directing attention. Practices vary widely in their standards of control, from precise bibliographic description practices that ask catalogers to use pre-existing fields and terms, to more open-ended narrative approaches seen more commonly in archival description. Unlike the descriptions in a novel, a catalog description must fulfill a pragmatic function, to inventory and provide future access to an item. What, then, does it mean for something to be ambiguous in the creation or use of descriptive records?

In this chapter, I map the terrain of structured description used in cataloging collections for CHIs including libraries, archives, and museums. This archaeological approach contextualizes the practice conceptually, through the values central to these institutions, and materially, through exploration of the infrastructures that determine what is possible.

Identifying the strata in this project requires careful use of language. The discipline of description often uses words interchangeably, making it difficult to point to differences between them. In Chapter 1, I provided a CV for this project. This chapter continues the work of definition as a form of excavation, employing categories and relationships to help us understand the broader context of descriptive practice.

I begin by establishing what it means to do and to think about structured description in the context of CHIs and identify the range of participants in the world of description. Next, I introduce the strata of values, standards and management systems. Following this overview, I discuss how CHIs are understood as *valuable* and how this shapes their collection and description practices.

Finally, I consider how two values of CHIs and cataloging, *access* and *stewardship* are operationalized in the field and enacted in description.

Having offered a broad overview of the social and technical constraints on description, I introduce a model of the process through which an item is described, which I call the chain of surrogation. This model helps us to ask: *what is difficult about disambiguation in this terrain?* If description highlights salience, its omissions cast ambiguating shadows, examples of residuality as introduced in Chapter 2. Alternatively, ambiguity might be seen as a kind of friction between the links in the chain or between the overlapping infrastructures that shape a descriptive record.

4.2 Mapping the Terrain of Description

Offered by Foucault as a method for examining the contours of moments in the history of science, an archaeology aims to uncover the discourses that determine what is possible in a discipline. Descriptive rather than interpretive, this method resists viewing a moment as fixed temporally on a gradient of change, instead considering the range of discourses present (Foucault, 2012). Scholars have taken different approaches in implementation of this method, often considering a particular artifact from an archaeological perspective that illuminates a disciplinary question (Law, 2009; Mak, 2014). In many cases, the distinction between Foucault's methods of archaeology and genealogy blend together as scholars consider questions of power that shape these artifacts. Foucault's interest in history and the term *archive* both literally and figuratively lends his methods relevance to scholarship in archives, where considerations of knowledge and power are regularly taken up in journals and conferences (Lowry & MacNeil, 2021).

This archaeology treats the catalog as an artifact shaped by conceptual, social, and material entanglements in the terrain of description systems.

4.2.1 DEFINING CATALOG DESCRIPTION

A collection is an intentional gathering of things. When I pick up beautiful leaves, or children stuff their pockets with rocks, we are creating collections, albeit fleeting ones. What compels us to add an object to our collection? Our approach can be as methodical as that of a philatelist who seeks stamps with images of moths, or as informal as the homeowner who purchases tools for home repair as she needs them. When a collection exceeds our capacity to readily access it, we may find ourselves sorting it, physically or mentally, based on characteristics as varied as size, place of origin, or the mood items evoke. So let us revise the first statement: a collection is an intentional way of viewing things that have been collocated or brought together. Our ability to describe things as being part of a collection defines the parameters of membership.

The collections gathered by CHIs share qualities with my own intentional and accidental collections, but their gathering is usually determined by the perspective and goals of the institution in which they are found. The public library gathers books and other media that the residents of an area would like to use. An art museum gathers works of art and materials associated with art. A municipal archive gathers documents related to the history and administration of a city. Generically, the types of items included in these collections are determined by the type of institution, though the holdings of one museum will be entirely different from another museum of the same type--and each of these institutions will likely hold materials we might expect to find in another type of institution. A description is a multi-faceted representation of something that captures its salient characteristics and reflects their value to the institution.

Conventions in adoption of standards for description are usually followed across institution types. Libraries, archives, and museums share many commitments and constraints but also have distinct goals and challenges related to their collections and communities. Local rules are often added to support specific needs, whether through the addition or excision of existing standards.

Descriptions attend to the particulars of the item for which they serve as a surrogate; the catalog as an aggregate of these records is given form by the contents of the collection. Through the catalog, it is possible to see the collection; through the collection, we can see the goals and values of the institution (Feinberg, 2008). The catalog, which serves the simultaneous functions of taking stock and providing access, serves both the institution itself and the users of the collection.

In contemporary cataloging contexts, most of the people who engage with a catalog are working with a management system with interfaces that both allow for backend data entry and frontend search and browsing. Users may or may not use the catalog to access physical items in the collection--and may not ever step foot in the institution. The digital catalog, accessible from anywhere, can serve as a proxy for the institution itself and have associative relationships through union catalogs with other institutions that are geographically distant.

Describing items may be a temporally linear process, but it is not a conceptually linear one. The relationship between an item and its surrogate mirrors that between collections and their catalogs. They are entangled in commitments and constraints managed by different people across roles and institutions. To discuss ambiguity in descriptive practice, we will find ourselves pointing far beyond the site of the cataloger's table.

4.2.2 PARTICIPANTS

Throughout this chapter, I will consider the perspectives and roles of five primary participants, singular and collective, in the work of description.

4.2.2.1 Institutions

An institution refers to the holder of a collection, in this work primarily libraries, archives and museums. The institution is comprised of material and conceptual components, ranging from facilities to legacy values, leadership structure to marketing plans. The presence of an item in a collection can be understood in relation to the resources and goals of the institution, however clearly or poorly defined they may be.

4.2.2.2 Catalogers

The cataloger (or equivalent description practitioner) represents items in a collection through methodical description. The rules and tools used may vary, but the end product of their work is a catalog record stored in a management system. The professional commitments of catalogers vary depending on the type of representation they do. Library catalogers inherit a tradition of bibliographic description that both classifies each item according to its subject and attends to its existence as a material object and a created work. Archivists, on the other hand, represent collections that can take many forms, from assortments personal papers to systematically created administrative documents. Archival description provides a contextual accounting of the origins of a collection, with an emphasis on authentication and provenance. Catalogers in museums often attend to the concerns of both library and archival contexts. Regardless of their training and worksite, catalogers work to represent items according to the goals and rules of their institution.

4.2.2.3 End Users

The end users of a collection are often imagined to be the public or some subset thereof. These are people who make use of collections. The catalog is designed to represent the holdings for these users, to let them know what is present and how they might access items. With digital catalogs and digitized collections, users can engage with an institution's holdings from a distance. Institutions are also end users, consulting the catalog to guide activities ranging from marketing and grant seeking to collection development. Catalogers may also view their professional peers as future users when considering how their work will be seen, understood, and integrated into the work of other catalogers.

4.2.2.4 Items

Animate or inanimate, the holdings of an institution are valued in relation to their identities. Given that representation in a catalog is the assignment of a surrogate identity for an item, these items can be viewed as participants in descriptive practice.

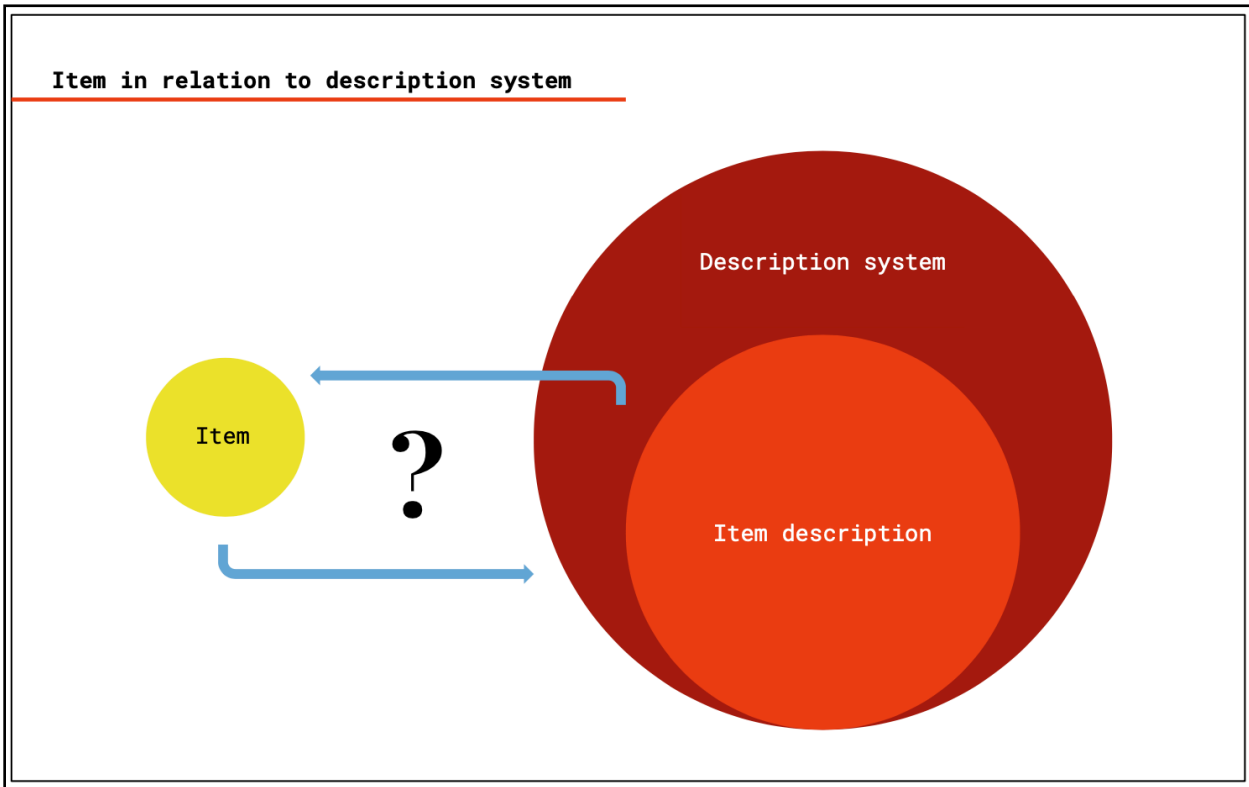


Fig. 4.1 The description of an item is determined by the constraints of the system.

4.2.2.5 Infrastructure Designers

While catalogers consider the priorities of their institutions and needs of users in deciding how they will represent items, their work is largely shaped by infrastructures designed and developed by people who have little to no direct interaction with that institution. From metadata standards to CVs, classification schemes to collection management software, catalogers rely on a range of rules and tools that are produced in service of a discipline rather than on behalf of their institution. These infrastructures originate from many sources, from professional organizations to for-profit corporations. Ideally, they are created to fulfill a known purpose and are thus legible to those who must use them, but their agnostic approach will often be ill-suited to the challenges of particular collections. These designers work within their own constraints of purpose and expertise. Whether their work is shaped by cultural or technical limitations, the rules and tools they design will account for and attend to considerations that may be invisible to their future users. In this work, I will consider the design of these infrastructures as distinct from their utilization, even in cases where practitioners are able to design rules and tools for their own use.

4.3 Identifying the Strata of Description

In this archaeology I will treat the catalog as the surface of the terrain that will be excavated. Below we will find the systems, standards, and values foundational to representation of collections. The form a catalog takes is dictated by system used to contain and support descriptions, which in most institutions is some form collection management software. Practitioners create descriptions through system interfaces that collocate fields drawn from an array of standards that govern descriptive practice. These standards comprise a stratum of rules that govern diverse aspects of representation, from conceptual models of items and the vocabularies used to describe them, to rules for transliteration. They set the ideals for what is desirable and possible and pragmatically aid in the implementation of values such as access and interoperability.

STRATA OF DESCRIPTION		
Structured description relies on multiple technical and social infrastructures that inform what should and can be said about an item in an institutional context. These infrastructures can be explicit or implicit, rigid or malleable. At times, their priorities do not neatly align, making the work of representation more challenging.		
Stratum	Stratum Description	Example Sites
Catalog	<ul style="list-style-type: none"> • Catalogs • Finding aids • Description systems 	<ul style="list-style-type: none"> • SPL catalog • WorldCat • Archives West • Getty Museum Collection online
Management System	<ul style="list-style-type: none"> • Collection management systems • Integrated library systems 	<ul style="list-style-type: none"> • Alma • Mukurtu • Archives Space • PastPerfect • OCLC Connexion • Wikidata
Standards	<ul style="list-style-type: none"> • Encoding standards • Terminological standards - Controlled vocabularies - Classification systems • Descriptive standards - Institution-based standards - Institution agnostic standards • Disciplinary standards - Codes of ethics - Strategic plans - Collection development policies 	<ul style="list-style-type: none"> • MARC • EAD • DDC • LCC • LCSH • Getty AAT • MeSH • RDA • DACS • CDWA • AAM Code of Ethics for museums • Smithsonian strategic plan • MoMA Collections Management Policy

STRATA OF DESCRIPTION		
Values	<ul style="list-style-type: none"> • Access • Stewardship • Interoperability • Sustainability • Authenticity 	<ul style="list-style-type: none"> • ALA Bill of Rights • AAM Code of Ethics for museums • Story times • Interactive exhibits • Consortia participation

Table 4.1: Strata of description, summarizing the definition and examples of each layer considered in this archaeology. The surface of the terrain is the catalog, which is shaped by a management system. A variety of standards shape what is possible. A wide range of values inform each of these layers and are enacted by other means as well; this chapter will discuss the values of access and stewardship.

The arrangement of these layers suggests a kind of inheritance or nesting relationship, with values guiding standards, which are taken up in systems, which shape catalogs. Yet not all values can be seen in standards; nor do standards necessarily dictate what is encoded in the catalog. Each layer is shaped by many participants, and layers are not homogeneous. Frictions arise not only between strata but within them.

In this section, I will further define values, standards and management systems. In the following section, I will consider how values shape description.

4.3.1 VALUES

The values of a community frame what is desirable, which in turn shapes what is considered possible. Both idealistic and pragmatic, they encapsulate what people feel is important (Friedman & Hendry, 2019). Whether explicitly stated or implicitly assumed, values are held and imparted from discipline to institution to individual practitioner. Understanding the values of CHIs and cataloging helps us to understand why decisions are made and to evaluate whether a course of action embodies those values.

Rather than examining every possible value related to the world of libraries, archives and museums and their practices of description, in this archaeology I will focus primarily on the values of **access** as public good and **stewardship** as custodial care. While each of these includes a constellation of embedded values, I will necessarily neglect discussion of an array of other values present in these institutions. Rather than offer a universal narrative of these values, I will explore how they are considered differently across types of CHIs. What this collection-agnostic discussion might lack in specificity I hope will be made up for in its demonstration of multiple possibilities in the approach of collections and description.

4.3.2 STANDARDS

While catalogers do make choices in how they will represent an item, their choices are guided by a variety of standards designed to make records usable and comparable. A standard allows us to make things happen across contexts. It essentializes that which it standardizes, highlighting what should be important for that thing to function. Developed in service of a task, it can be broad and open to interpretation, or narrowly specific. An ethical standard for collection development will offer guidance but may not have a clear measure for success of implementation. Implementations of encoding standards, on the other hand, are more readily assessed by their ability to function.

Their design, in process and form, relies on their purpose. As Busch (2011) notes, "...As a category of experience, standards span the material and the ideal, the positive and the normative, the factual and the ethical, the sacred and the profane" (p. 3). Standards in description systems attend to comparability by constraining how one can express what has been noticed about an item. Most descriptions are created in accordance with several standards, many of which are created outside of the site of description and are not necessarily designed with attention to their compatibility with other standards.

As a stratum of the terrain of description, standards are the infrastructure that shapes the attention given to an object of representation. Their overlap and incongruences require the cataloger to decide which will take precedence in a situation. Contextually agnostic, most standards are created by committee at a disciplinary level. Many require local interpretation to serve the needs of a collection or community. The distance between a standard and its site of use make it challenging in most cases to transform these rules. Moreover, standards cannot change for each outlying case; the integrity of the standard must also be maintained.

Standards in description systems attend to an array of issues. **Disciplinary standards** dictate what is acceptable and desirable in practice. **Descriptive standards** direct one's attention to the relationship between an item and the domain in which it is described. **Terminological standards** regularize how things are described so that they might be readily compared. **Encoding standards** guide practitioners in the creation of records that will be legible and interoperable in computing contexts.

While these four types of standards inform description and support values of access and stewardship in various ways, they are at times at cross purposes. Practitioners must navigate them to the best of their ability in service of their institutions. Their embeddedness in a description is usually inscrutable to users, who are unable to see how the description is a response to these constraints.

4.3.2.1 Disciplinary Standards

Disciplinary standards are the explicit and implicit ideals that guide the work done in CHIs. They may be developed by professional associations, such as the principles governing librarianship set out by the ALA, or at the institution level, such as the collection development guide of a particular museum. These standards codify the ideals of institutions to align values in a pragmatic manner, dictating what should be done, what should not be done and how the institution should make decisions about a collection. While these standards are generally created to guide the institution rather than the practice of description, they have implications in how descriptive work is done.

4.3.2.2 Descriptive Standards

How we see a thing shape how we describe it. Descriptive standards direct our attention to items in the context of the collection. They guide us through the cognitive process of making sense of items and through the technical process of recording their presence. In so doing, they bring the goals and values of an institution to the act of cataloging. The structures of Resource Description and Access (RDA), Categories for the Description of Works of Art (CDWA) and Describing Archives: A Content Standard (DACS), for example, structure description for institutional contexts. RDA integrates the conceptual models of FRBR and Functional Requirements for Authority Data (FRAD), which define relationships between creators, works and iterations of those works, including non-bibliographic materials. Attending to descriptive cataloging, it focuses on how an item came to exist, rather than on its subject. CDWA emphasizes the characteristics of unique items of art. DACS, on the other hand, draws attention to the “qualities of archives as records,” while recommending that archivists turn to other standards for aid in describing characteristics of their materials (Society of American Archivists, 2020, p. vii). Each of these standards provides a set of core elements that must be included for an item to be adequately represented. Classification schemes such as LCC or DDC similarly aid in description at a conceptual level and prioritize collocation of items and organization of the collection as a whole. Along with CVs such as the Library of Congress Subject Headings (LCSH), classification schemes in library contexts aid in subject cataloging. While descriptive and subject cataloging are often undertaken at the same time, they are distinct tasks.

Descriptive standards are designed to make representations usable within an institution but also to allow for comparison across institutions. With networked catalogs in libraries and online access to catalogs and finding aids for museums and archives, comparison allows users to find what they need from outside of the site of the collection. The descriptive standards adopted by most CHIs are developed by committee on behalf of a professional organization. While practitioners may contribute to conversations about revisions of standards, they are not easily changed in situ. A practitioner must do their best—or ignore a standard when it is difficult to follow. In some

institutions, modifications to standards are locally implemented through supplementary guidance or protocols that address the peculiarities of the collection.

In their attention to both the conceptual and structural aspects of description, these standards inform our understanding of what it means to describe an item, which in turn influences what we see as worthy of description.

4.3.2.3 Terminological Standards

While descriptive standards draw our attention to relationships between salient characteristics of an item, the terms we use to name those characteristics are made consistent through terminological standards. Controlled vocabularies establish, perpetuate, and disseminate disciplinary concepts. They limit the terms that are used to facilitate consistency across descriptions, allowing us to gather, or collocate, items with a shared characteristic. At the same time, they can reduce what is possible to express in each field. Like descriptive standards, terminological standards or thesauri are often created outside of the context of a collection. This allows for comparison across sites, as well as across fields, yet these tools may not suit the needs of many collections. The subject terms of LCSH, for example, are employed in a wide range of international libraries, yet they largely reflect the perspectives of the United States government to serve the organizational needs of the Library of Congress. Changes are regularly made to LCSH, but the commitment of the editorial staff remains with the parent institution. While several large CVs, including Sears subject headings, Medical Subject Headings (MeSH), and the Getty Art and Architecture Thesaurus (GAAT) are widely used in many institutions, abundant domain-specific CVs exist as well, and may be developed on site to suit local needs.

Control is conferred not only through vocabularies related to subjects and characteristics of items, but through authority records. The authority record for an author, for example, is used to point only to that exact author; one has no choice in approaches to assignment. The creation of authority records used in many CHIs, created by participants in the Name Authority Cooperative Program (NACO), are less standardized than the development of the major CVs, which can lead to a wide range in their quality and depth.

4.3.3.4 Encoding Standards

For descriptions to be accessible, they must be created in formats that are compatible with the computing environments in which they are stored. The introduction of Machine Readable Cataloging (MARC) in the 1960s allowed for the creation and dissemination of records that included the elements outlined in both descriptive and subject cataloging rules. While MARC is maintained by the Library of Congress and thus strongly associated with the bibliographic description needs of

that institution, it is used to encode representations in a variety of settings. As a result, the MARC tags do not perfectly align with other standards that might be employed in description. Alignment of elements are provided through numerous crosswalks, which map or translate the MARC tags to fields in other standards.

The limitations of MARC in representing archival materials led to the development of Encoded Archival Description (EAD), which provides a machine-readable framework for a complete finding aid, allowing archives to be more accessible; in some institutions both a MARC and an EAD record will exist to facilitate discovery in the catalog.

Encoding standards also inform how fields are transcribed. In cataloging non-Latin scripts, this requires romanization standards, which limit the ways that a word can be written (and thus discovered).

While alternative encoding standards such as BIBFRAME, which uses a linked data model, may replace MARC, the necessity of machine readability requires attention to compatibility with computing environments that may limit the range of expressions that a structured description can take. Encoding standards facilitate comparison across collections and institutions, as well as transmission and receipt of records created outside of the local context.

4.3.3 MANAGEMENT SYSTEMS

Catalogs for most CHIs are created and stored in CMS software that is designed to structure the data that comprises a record. These systems come in many configurations to serve the needs of a variety of kinds of collections. Sometimes multiple systems are used in tandem. The structure given to data in these systems is determined in large part by the standards employed, which direct our attention and our action.

The representations created in these systems not only describe items but inventory them. This function allows integrated library systems (ILS) to both manage representations in the catalog and support circulation of items, including materials such as e-books and audiobooks. Systems designed for archives and museum collections may additionally provide access to materials such as digitized photographs alongside their descriptions. Each of these systems provides a backend, in which practitioners can add and edit descriptions and other relevant metadata associated with collections, as well as a front end through which users can access these descriptions. Libraries rely heavily on the public-facing catalog to provide users access to materials they are seeking. Museums, on the other hand, may not provide robust public-facing catalog access, treating the catalog more as a tool for internal use and imagining its audience as staff members who need to track and retrieve items. Regardless of the intentions for public access, these systems structure the catalog and make

the collections across institutions comparable, whether or not they are directly interoperable as in union catalogs.

Like any software, opportunities and limitations are created by the structure of the interface. The cataloger's experience working with these systems is essentially one of filling in a template or form. The fields available, as well as their possible inputs (often called values), are derived from and support a variety of standards. The collocation of standards in these systems allows practitioners to attend to them simultaneously, yet their arrangement may also constrain how they are considered or deployed, as their relational aggregation becomes standardized across descriptions. Whether or not one can extend, modify, or exclude fields, or rearrange relationships between them, is determined both by the standards and by these systems—one might take different approaches for describing the same item depending on the collections management system used. End users, on the other hand, have limited understanding of the construction of these records and encounter them through the searching and browsing capabilities of the system. While standardized description aids in these retrieval processes, their accessibility is largely determined by software developers who create discovery layers by designing user interfaces and scripting search algorithms.

Like standards, CMSs are usually designed and built outside of the institutional context. The options for transforming their design are limited and resemble user relationships to many other forms of software, relying on the developers to respond to feedback with updates. While practitioners consider the merits of different CMS packages by navigating the world of sales literature, webinars, and hearsay from peers, the high cost of moving from one platform to another favors making do with what one has until it fails to work.

4.4 Establishing Value

The *values* of an institution are its internal commitments, developed on site but also drawn from CHI discourses in professional associations, training programs, research, and scholarship. The *value of* an institution is an external assessment of its role in a community. We could use the term *ideals* or *goals* to describe the internal motivations of an institution, yet the word *values* is commonly linked to discussions of mission and vision. Alternatively, we could refer to the external assessment of an institution in terms of the *functions* it serves. Yet doing so diminishes the economic valence of the term *value*, which is tied to institutional need for and provision of resources. Because collecting requires resources and is seen as a valuable endeavor, I will begin my discussion of values with a brief consideration of the external value of institutions before moving to those they hold.

4.4.1 THE VALUE OF CULTURAL HERITAGE INSTITUTIONS

CHIs are predicated on a belief that they are *valuable* to their communities. That is, beyond the knowledge an individual might gain at a site, whether by borrowing a book or viewing a piece of art, the presence of such a site is seen as beneficial to society. We champion museums for their educational and entertainment value. We revere archives for maintaining procedural and cultural memory, thus improving governance. We celebrate (or malign) public libraries for their ability to provide community education and, increasingly, social services. We appreciate that academic and research libraries support the capacities of their audiences to build knowledge and products, which enhances the economic standing of the institutions with which they are affiliated. While each of these statements might be seen as hyperbolic, they are illustrative of notions of institutions as civic infrastructure, which not only serve informational needs but uphold democracy (American Academy of Arts and Sciences, 2020).

4.4.1.1 Civilizing Institutions: Collective Education and Memory

Our language for discussing the benefits of these collections has shifted over time but continues to emphasize their power to bring (some of) us together. Whether the shared perspective is introduced or reinforced by these sites, they are seen as having the power of *civilizing* visitors. In some versions of this narrative, the visitors come to a site lacking and are educated or restored to a civilized state through their experience. The responsibility to civilize is held by the institution, whose guidance comes in the form of carefully developed collections with a variety of “quality” materials (George, 1895), or through explicit interpretation of the materials on display. Yet civilizing need not be imagined in such paternalistic terms. It might also be seen as an experience undertaken by the visitors themselves as they commune with the items in a collection and come to understand their relationship with both the objects and the world through those rituals of engagement (Duncan, 1995). The term *civilizing* promotes an orientation toward a status quo that has been rightly critiqued as maintaining systems of power and exploitation. While museums in particular grapple with their historical reliance on colonialist notions of civilization as a motivation for and theme of collections, they remain places where individuals have the chance to expand their understanding of the world and perhaps view it differently, together (Dudley, 2015). The museum gathers and holds cultural capital for a community, collecting items that can be accessed by visitors that will be valued for a variety of reasons, from aesthetics to historical import (Keene, 2006).

Libraries and archives collect materials for their users to interpret independently. While the language of civilization is seldom used in public libraries now, their champions continue to posit their power of democratization. Materials available through public libraries foster self-cultivation, while their shared spaces and programming cultivate community. While we may falsely romanticize

the power of these institutions to foment positive social change, they have served an incredible range of needs for generations of users (Wiegand, 2015). Use of CHIs is not only symbolically connected to social transformation, however. Access to archives, especially government archives, can be seen as a direct expression of and participation in citizenship (Grut & Press, 2017).

Regardless of how we talk about the transformative power of these institutions, we entrust them as keepers of collective memory, storing traces of the past in many forms so that we can perpetuate and expand our knowledge. We value them as warehouses of information and sites of inspiration. In addition to the value of their contents, CHIs are valued as physical places, ideally ones with architecture that attracts and awes the public through spatial demonstration of their values. From the courtyard of a museum or the soaring lobby of a central public library, these institutions are often touted as destinations for tourists and locals alike. The space in which a collection is kept or displayed is seen as having the power of elevating the collection, which in turn can transform the visitor. Museums are especially likely to be designed with attention to their power not only to share items but to force interactions between people by maintaining a kind of orchestration of movement through spaces (Lehmbruck, 1974). Public libraries, on the other hand, are designed with the notion of openness in mind, allowing the visitor to meander through as many of the spaces as possible (Worpole, 2013). Archives are less often seen as grand civic spaces, but are popularly associated with silence, locked drawers full of secret documents, and white gloves. Though not terribly accurate, these depictions are often aesthetically vivid, illustrating what we value about the archives as protectors of secret knowledge or as embodiments of bureaucracy (Archives @ PAMA, 2016).

4.4.1.2 Institutions As Assets

While their social value may be educational or inspirational, very material concerns with facilities, labor and budgets require collection advocates to understand and promote them as having and generating value beyond their conceptual missions. The ability of any institution to retain its status as an asset for a community secures its financial sustainability. Whether billed as tourist destinations or incubators of future economic value, these institutions vie for funding from granting agencies and visitors alike. Governments at all levels may consider the economic role of these institutions in their purview and strategically consider them to be resources and as worthy of resources (Dümcke & Gnedovsky, 2013).

We value access to collections as a public good yet must navigate fiscal conceptions of value that emphasize economic efficiency. While any institution must pay attention to balance sheets, the ways that institutions balance budgets have in recent years led to staff reductions that hinder the ability of institutions to serve their users. Meanwhile, institutions of all sorts must pay close

attention to their marketing strategy, not only to make their collections more accessible but to demonstrate their value. Description of collections in this way becomes a means of advocating for resources for the institution as much as advocating for user access to items (Cullingford, 2016).

While understanding the value of CHIs is not central to this project, recognizing that description work is undertaken on behalf of institutions that are perpetually aware of their perceived value invites us to ask how items are represented as resources and as recipients of resources.

4.5 Values of CHIs

Cultural heritage institutions develop collections to provide and support knowledge. Balance between access to and stewardship of collections is determined largely by institution type, as seen through the documentation of professional organizations. The rights listed by the American Library Association (2019) begin:

1. Books and other library resources should be provided for the interest, information, and enlightenment of all people of the community the library serves.
2. Libraries should provide materials and information presenting all points of view on current and historical issues. Materials should not be proscribed or removed because of partisan or doctrinal disapproval.”

A parallel statement can be found in the collection’s stewardship standards issued by the American Alliance of Museum (n.d.), which notes:

Guided by its mission, the museum provides public access to its collections while ensuring their preservation.

The role of the archivist in facilitating access, as outlined by the Society of American Archivists (2016), is to:

Identify the essential evidence of our society and ensure its availability for use by students, teachers, researchers, organization leaders, historians, and a wide range of individuals with information needs.

The audience of an institution shapes how values of access and stewardship are implemented. Public libraries serve broad information needs of individuals in their locales. Academic and research libraries provide information resources and research support to faculty and students, while also serving the broader missions of their affiliate institutions. Archives assemble evidence of something that has happened and provide research access to their collections. Museums invite visitors to engage with their domain of focus through exhibitions that emphasize education or interpretation through intentional arrangement and description of items.

Whether audiences are expected to bring items home or view them through glass is a matter of access; whether items are considered replaceable, disposable, or rare determines approaches to stewardship. In the following sections, I will consider a range of conversations circulating about access and stewardship in CHIs. These values not only inform the policies of institutions but shape how items are described.

4.5.1 ACCESS

Access points to the relationship between an item and a person who might use it, emphasizing their ability to know it exists, to find it, and to get it in whatever form it is available. To understand what the value of access means in cultural heritage contexts, we can ask both what is being accessed and who is allowed to access it. The answers to these questions vary and sometimes conflict across institution types, highlighting the complexity of this value in relation to collections. In the following sections, I will consider two dimensions of access. The first attends to collection development, asking what is accessed in CHIs. The second considers who can access and what it means to expand access.

4.5.1.1 Developing Collections for Access

A CHI serves its audience through access to and engagement with its collection and programming. The collection of each CHI is unique, a reflection of choices made in service of its mission. From local guidance such as collection development policies to broad disciplinary standards such as the ALA Bill of Rights, disciplinary norms and standards govern how those choices are navigated.

The materials held by a library and a museum differ both in kind and in how their audiences expect to engage with them. Access to collections might provide information, education, enlightenment, evidence, or entertainment. These benefits can be extracted by individuals or presented to them. Libraries often develop collections that reflect the needs and desires of their users, while archives and museums typically develop collections based on some narrower criteria and invite users to engage with them. Contrasting the motivations for collection development among CHIs can draw our attention to a range of commitments reflected in descriptions.

Library Access

While bibliographic materials have been their defining feature, libraries provide access to a wide range of materials and services that allow individuals to inform themselves. The library has long been seen as a place where one could access information needed or discover new perspectives, a place for self-discovery and actualization, whether you wanted to learn how to make wine or were seeking spiritual guidance (Wiegand, 2015). Unlike schools, however, public libraries also build

collections with forms of entertainment that their audiences desire (American Library Association, 2019). From novels to streaming movies to board games, collection development in public libraries is ever shifting to suit the needs of their users, both in content and format. The collection, then, reflects the community in a moment.

Academic and research libraries also serve the information needs of a community. Unlike public libraries, however, they are beholden to their parent institutions and must serve their missions as well. Collection development in these institutions addresses the specialized research needs of students and faculty as members of disciplines. This requires acquisition of materials such as peer-reviewed journals and monographs by specialized publishers that are costly but necessary for participation in many fields (Reed, 2016).

Across library types, reference librarians and subject specialists help users find and make sense of items. Whether they are assisting someone with finding government forms or sources for a literature review, their services are central to the provision of access. Unlike search engines, reference librarians can serve as mediators, aiding visitors in refining their questions and seeking their answers, as well as developing programming that teaches visitors how to use these materials on their own (Cassell & Hiremath, 2018).

These services and programs complement the collections held by libraries, expanding what is available to be accessed. Story times, writing workshops, and wi-fi hotspots extend our conception of what constitutes an accessible resource. Library journals, Reddit threads and Pinterest boards are full of other examples of services and programs that transcend traditional formats of information access to support both survival and joy of library users. In public libraries especially, the concept of access might be understood as advocacy for community care, a value that transcends texts and information objects.

Archives Access

The promise of archives is somewhat different. Rather than cater to open-ended user information needs, these collections offer users the chance to understand material that has been highly contextualized. Contemporary archival practice is shaped by European traditions of holding legal documents for future consultation (Duchain, 1992). What one accesses in an archive is evidence. Though a researcher might look at legislative documents and the personal papers of a choreographer as very different kinds of evidence, pointing to entirely different sets of questions, the structure of the archives attends to them similarly, pointing to the informational value of the material therein while attending to the concerns of authentication that shape how a user makes sense of it (MacNeil, 2005). Individual materials are of lesser importance than the relationships between items that are inherited from their source of creation. Thus, the systematic archive of an administration reflects an accrual over time, while an archive of personal papers (often described as manuscript archives) will retain the order given by the creator to disparate items (Schenk, 2018). Access to

evidence, regardless of its form, recognizes the user of an archive as a witness who can both receive and interpret information, building knowledge of the contents of a collection.

Museum Access

Compared to the collections of libraries and archives, which can be described as primarily document-oriented, museums usually collect objects that are demonstrative of the institution's focus, whether art, culture, or natural history. While each type will have distinct approaches to collection development and access, museums usually interpret their collections, though the visitor may engage with items in their own way (Casey, 2003). Collection development is made accessible to visitors through exhibition design. Whether informational materials are read, audio guides heard or walking paths followed, most visitors will go to the museum to browse, or see what is there, rather than to search for one thing. Most museums create formal separations between objects and visitors through display cases, frames, and other barriers. Exhibits may include interactive elements, but one rarely takes items home. Some museums have study collections that researchers can access, usually through a formal or mediated process. Whether one accesses folios of artist prints or drawers of carefully stuffed and tagged songbirds, these materials are often arranged in a manner similar to archives, evidence for scholars to interpret while taking notes in the hush of these less-public units (Keene, 2006).

4.5.1.2 Expanding Access

To understand what it means to value access in a CHI, we must know not only what is accessed in terms of materials and services, but what use visitors might expect to get out of that access. The variety of things accessed and user responses to that access across these sites is further complicated by questions of who has or can gain access and whether they will find what they seek.

The holdings of libraries, archives and museums, and the services they offer, signal their anticipated user groups. Yet serving more users is central to the mission of CHI work, each visitor proving its value and justifying its perpetuation or growth. Expanding access in these institutions has taken many forms, some facilitated by changing technologies, others borne of critique from within and outside of these institutions.

Digitization

Perhaps the most straightforward way that CHIs have expanded access in the past two decades has been provision of digital materials. From e-books, to scanned photographs, to digitized and transcribed manuscripts, remote access allows a wider audience to make use of a collection. While digitizing efforts may seem like a panacea to issues of access, they are costly to implement and maintain, and are rife with their own complications related to sense making of the scanned objects

(Mak, 2014). Even when the item itself is not available, online catalogs and finding aids allow wider audiences to be aware of the presence of materials in a collection.

Interaction

Interactive exhibits can provide a new way to engage with or access existing items. While children's and science museums have long provided educational exploratory exhibits, new modes of interactivity have emerged with the advent of social technologies, ranging from app guides to deployment of hashtags for social media promotion. One of the most prevalent recent discourses about visitors in CHIs attends to selfies in these spaces, spurring arguments that selfies are good for free advertising or disrespectful of institutions (Ross, 2019); participatory creative acts (Lewis, 2017); and inspiration for exhibition design (Cesário et al., 2018). While the selfie debate is quieting, visitor participation patterns shift how we think about what it means to access these collections—and highlight the ways that practitioners and administrators of these spaces have historically imagined who participates and how it ought to be done.

Participatory culture, which expands beyond technological interactivity to include users in a variety of programming, shifts the authority of these institutions, whether it results in changes in how they describe their collections or re-examination of the communities they want to serve (Stein, 2012). Digitization and interactivity both expand modes of access but do not fully address the exclusionary history of CHIs.

Inclusion

In CHIs, development of collections and services are intended to meet the needs and represent the perspectives of their communities. The definition of which communities ought to be served, however, has changed over the decades. Underrepresented populations span a variety of demographic categories including age, race, gender, language spoken or read, sexuality, disability status, and immigrant status, each with unique characteristics. Inclusion has moral and practical dimensions. Who is it supposed to serve? In pursuit of a pluralistic society, CHIs straddle a line between educating dominant groups about the experiences of the marginalized and serving those communities directly. It is one thing to say that people are invited into a CHI, but another to attend to their needs.

Building a multilingual collection, for example, is not only a matter of procuring materials for circulation, but appropriately cataloging them and building community partnerships to market these offerings (Hill, 2018). A parallel challenge attends "diverse books" lists. While they may aid in collection development, allowing the shelves to reflect the variety of identities held by users, labeling them as such reifies dominance by treating as normal the many materials that are by white authors or about white characters (Brown, 2020).

Access in U.S. public libraries is strongly associated with free speech and the right of individuals to seek and find access to the information they wish to find (Slone, 2013). This value, commonly discussed as a constitutional right, shapes curatorial objectives of collection development. While practitioners have been moving away from defending the library as a “neutral” institution, collections continue to include materials that meet the information needs and desires of diverse users without a unifying narrative (Scott & Saunders, 2021). Despite the ideal of libraries as places where free speech is supported for and practiced by the full spectrum of participants, policies such as late fines have rendered libraries spaces for the privileged: only those who can afford to pay off fines can clear their debts and borrow freely (Chung, 2021).

Discussions of inclusion in research and academic libraries emphasize the role of diversity in student experience and in support of scholarship (Cruz, 2019). Increasing access in these institutions needs to include both support for students and care for collections that support diverse research agendas. While institutions grow and require more space for students, many libraries are moving less popular materials offsite; such disuse would trigger deaccession in a public library (Reeves & Schmidt, 2011).

Like libraries, contemporary archives and museums may address inclusion through development of collections that represent and serve more diverse user groups. While these institutions want to be seen as trusted repositories for materials from diverse communities, even community archives can fall into exploitative patterns of material acquisition (Apple, 2021). Inclusive collection development policies do not guarantee accessibility.

On the other hand, inclusive collections may not be suitable for expansive notions of access. Indigenous materials and knowledge have long been exploited by CHIs. Alternative approaches to access of these materials have been discussed among library, archives and museum practitioners, and community advocates. From finding new means of creating community-based repositories (Duarte & Belarde-Lewis, 2015) to organizing collections in accordance with community-derived categories (Bowe chop & Erikson, 2005) to restricting institutional access to descriptions (Glass, 2015), appropriately caring for items, and information about and within them, sometimes includes restricting access to some audiences. These approaches not only challenge notions of access held dear in libraries but disrupt Western archival values of memory keeping that rely on narrow conceptions of time and continuity as necessary to establish provenance. The value of access can seem to champion a vision of total openness whereby lack of access is equated with secrecy and malfeasance.

Who belongs and how they can appropriately participate transcends questions of collection development, especially in libraries that increasingly provide services that once would have been in the domain of schools or government programs. Inclusion of community members such as individuals experiencing homelessness often involves the development or procurement of resources

that would not show up in the catalog, such as outreach workers (Hill & Tamminen, 2020). Other efforts at inclusion have centered on expanding access to technology, though critics point out that providing passive access to information is not the same as understanding and meeting the information needs of a community (Muddiman et al., 2000). Questions of freedom are linked to considerations of access in U.S. public libraries, where concerns about programming and use of space have been lately framed around the dangers of hate speech (Twiss, 2020). The relationship between items that are available to access and the people who would access them is a loop. The role of description in facilitating access, then, attends to the audience as well as the materials, highlighting what is present both materially and conceptually.

4.5.1 DESCRIPTION FOR ACCESS

In the previous sections, I addressed two aspects of the value of access in CHIs. First, I considered *what* is accessed in different institutions. From concrete items such as books and wi-fi hotspots, to conceptual resources such as education and evidence, and social resources like story times and other programming, these institutions provide access to many things, only some of which are directly represented in the catalog. Next, I considered what it means for these institutions to think about expanding access, not only by adding materials and programs, but by finding ways of serving more people. These two conceptions of access are not mutually exclusive. Neither can be fully addressed through tactics in representation, but in this section I will consider how descriptive practices support each.

Viewing access as a matter of making items in a collection available to users, we can see description as the mechanism that pairs them. In libraries especially, the catalog interface determines how access is initiated and navigated. The implementation of an ILS shapes the experience of access, inviting the user to search, browse, and procure. The legibility of the standards employed in representation are limited to the viewable fields and the terms used therein. Terminological standards such as subject headings are more intuitively navigated than the descriptive standards that drew the cataloger's attention across an item in a methodical manner. Encoding standards are mostly invisible unless they have been incorrectly implemented, sometimes making the interface of the catalog appear strange.

In bibliographic description, conceptual models FRBR and FRAD are embedded in RDA, which standardizes statements of authorship and publication. Attention to these characteristics is especially important in the inventory functions of the catalog, recording the presence of each copy of a work in a particular form. Inventory alone is not description; cataloging brings together this functional aspect of a record with the assignment of terms that signal the subject or *aboutness* of each item. This task is not simply extracting keywords, as subjects "are complex to the extent that they represent not a single concept, but a system of concepts" (Svenonius, 2004, p. 581). The subjects

assigned to items may or may not align with user understandings of the terminology they use. When subject terms do not match user expectations, however, they fail to represent an item. Access, then, is thwarted, even if such barriers are not intended.

Asking who can access the resources of a CHI, we consider the ways that descriptions anticipate users. The highly structured world of library description imagines access as successful retrieval of an item by a user with a particular known need (Ranganathan, 1967). Both the materials in a collection and the set of users are understood as somewhat stable and knowable. The work of the cataloger is not to expand the collection and provide access through community outreach, but simply to facilitate the match between the reader and the book. The ideal fiction of symmetry imagines a single or a universal user whose ability to find materials they need or desire is unimpeded by the complications of their experience or the language of description. Many scholars, however, have highlighted the ways that stigmatizing, alienating, or simply unintuitive terms in classifications and subject headings prevent users from finding their books (Adler, 2017; Fox, 2016; Furner, 2007; Higgins, 2016).

Viewing access as an issue of inclusion, many practitioners advocate for accessibility of materials through strategic use of language. This requires catalogers to attend not only to the materials at hand, nor to the known users that are able to access items, but to those for whom exclusion from the library is an ongoing problem, unrecognized and invisible until advocates within the cataloging community propose solutions. In doing this kind of advocacy, practitioners map the pragmatic constraints of cataloging to discourses in culture that often actively challenge the kinds of hierarchical and mutually exclusive logics of classification and structured description.

Advocacy for changes in standards also requires facility with the arguments most persuasive to the entities that edit or manage these infrastructures. For example, a campaign to change the LCSH term *illegal aliens* was effective to a point; in 2021 a change was made, substituting the terms *noncitizens* and *illegal immigration*. A statement issued by the Program for Cooperative Cataloging (PCC) Diversity, Equity, and Inclusion Advisory Committee acknowledged the duty and relationship that LC has to the United States Congress and argued for transparency in the decision-making process that had led to a change that did not align with suggestions from the cataloging community (PCC Diversity, Equity and Inclusion Advisory Committee, 2022). While the committee addressed concern about the power of language to influence perception of a group of people, they also pointed to the failure of the revised terminology to represent the range of materials that would benefit from expanded subject headings.

While many people are affected by these infrastructures, their capacity to see them or intervene is often limited. Designers and editors of these infrastructures do not necessarily turn to cultural conversations about preferred terms to inform their work, as can be seen with the recent changes to MeSH demographic terms. At the time of this writing in 2022, catalogers have raised

concerns about terms and scope notes that suggest racial terms that fail to match community terms of representation, with potentially significant consequences for medical information. In response to practitioner mobilization, the National Library of Medicine scheduled listening sessions, the results of which are yet to be seen (National Library of Medicine, 2022). Changes that take place may be implemented slowly. In the meantime, catalogers might ignore the available headings in favor of alternatives that better suit their needs, with consequences for the automated revision of subject headings intended to facilitate uniform access to materials.

In these changes to MeSH, we can see how infrastructures of description can directly impact access as a matter of retrieval and of inclusion. While keyword search may render us less reliant than we once were on classification to access materials in the library, the formal structure of a bibliographic catalog record provides the data which is scoured by search algorithms. The ability of a user to find an item depends both on their understanding of the terminologies used in the description and on the algorithmic approach taken to sorting the results of the catalog (Reidsma, 2016). The inscrutability of these systems excludes users even as they may seem more accessible due to the availability of familiar approaches to search.

Barriers to access are not limited to problems with terminological standards. Even though encoding standards such as MARC are explicitly designed to facilitate retrieval access, the approaches taken in encoding have consequences for both retrieval and inclusion access. One of the most pronounced challenges can be seen in romanization rules for transcription of materials in non-Latin scripts, where rules may not reflect the practices of communities (Dagher & Soufi, 2021).

The examples shared in this discussion of description and access center on cataloging in libraries both because these institutions facilitate access by allowing direct use of the catalog, and because the infrastructures employed in library cataloging are most directly aimed at retrieval. These difficulties of facilitating access, however, can be seen in the descriptive practices of other institutions. Museum and archival descriptions require less structure, which may impede access to items, but also allow more flexible approaches to description, which may allow catalogers to represent items in ways that are more inclusive of a broad range of users.

4.5.2 STEWARDSHIP

Stewardship as a value complements access, emphasizing the care that an institution gives to collections and items that comprise them. This value can be applied at different levels, from collections to items, concepts to materials. While the values of access and stewardship both inform descriptive practices, they are balanced differently across institutional contexts. Stewardship is not only care for items, but care for the ethos of an institution, attending to the value it offers to a community. As such, it must attend to the resources within and available to an institution,

emphasizing efficiency in support of sustainability. In the following sections, I will discuss three conceptions of stewardship, as maintenance for use, preservation, and contextualization.

4.5.2.1 Maintenance for Use

Materials must be maintained to be available for access, regardless of the type of institution or collection. In a most basic sense, their location should be known so that they can be retrieved, and their material integrity should be looked after. In a library this might mean making sure that all the components of a circulating item are present when it is returned, while in an archive it could entail returning all boxes to their shelves after they have been used by a visitor. The importance of use, whether or not items can leave the site, requires they are available.

Maintenance at the collection level is the provision of care in the selection of materials. In public libraries, this is responsiveness to local user interests as well as to the range of materials that are published. In academic libraries, this requires keeping up to date with relevant materials while also retaining items with potential research value (Uziel, 2017). For digital collections, maintenance will require hardware and software updates to ensure the stability of materials.

Maintenance, of course, also signals a process of disrepair or degradation that results from use. To maintain an item is to ensure that it is still usable and accessible; to maintain a collection is to attend to the ways in which it is and can be used. In libraries especially, this will include noticing when an item is too damaged to circulate. Looking at circulation records might highlight not only those items that are worn from heavy use but those that are unused, which might be marked as candidates for weeding. Maintenance in these collections, then, is not only a process of perpetuation but provision of active attention to what is present and how it might be used.

4.5.2.2 Preservation

Museums and archives maintenance parallels that of libraries, but with the additional emphasis on the uniqueness of items in their collections. While circulation may not be a mode of access, the availability of items for use or display is ensured by taking care of them materially. One way that we preserve things is to attend to the conditions of their storage. From acid-free boxes and folders used in archives to highly secured storage areas, preservation is resource intensive. Of course, we want to ensure that the items we store are in the best possible condition, maximizing our efforts at keeping them for indefinite future use. In some settings, this requires restoration work, a skilled form of labor.

In emphasizing preservation as a form of stewardship, we are often attending to items as irreplaceable and hoping to maintain their use as authentic examples of their form. Authenticity in archives is ensured not only by minimizing wear of items, but by retaining their order. Order is

preserved from accession through use, as items are carefully filed and described to retain and reflect the original relationships between items. In physical archives, users are restricted in how they open and use materials to prevent the comingling of items that belong in separate files.

Digitization may also be seen as a form of preservation, allowing a wider audience to access an item without putting more wear on the original item. In academic libraries, stewardship through preservation demands attention to a range of issues often associated with digital humanities and e-science scholarship, from curation to metadata implementation to guide data reuse (Owen, 2017). Regardless of the approach taken to preservation, as a form of stewardship it attends to issues of accuracy and authenticity of material objects, not only caring for what is present but declaring what should be preserved in the future to ensure collective memory (Brothman, 2001).

4.5.2.3 Contextualization

Maintenance and preservation represent forms of care for the materials that are accessed by users, yet stewardship as a value extends to the conceptual aspects of items, advocating for them to be understood in particular ways. Stewardship as contextualization is especially relevant in description work, ensuring that users can access items and make sense of them. This work advocates for items to be discovered and used in accordance with the goals of the institution and needs of its users.

Descriptive contextualization aids in the interpretation, verification and arrangement of items and collections. In public libraries, where the collection will shift over time to user demands, items must be readily discoverable by non-expert visitors. Advocacy for items might be seen in terms of promotion or marketing of their existence and potential use, whether through shelf displays or library guides. Contextualization in both public and academic libraries is provided in large part through location of items, which is determined by their subject content. Assessment of content allows catalogers to classify items and provide shelf numbers that collocate materials about the same topics. Wandering the stacks, a visitor can encounter a range of approaches to topics and see how they relate to conceptually adjacent themes. While this form of care may not help users understand the context of production of a particular item, it will invite them to understand it as one statement among many. Because library collections largely consist of materials valued for their informational content more than for their unique characteristics, contextualization in these settings attends to the relationship between items in the collection, or perhaps to comparison of collections between institutions.

Contextualizing archives requires much greater attention to the details of items in a collection and the relationship between them. Attention to order and provenance motivate traditional archival work and distinguish it from the care of similar materials that have no inherent relationship or ordering, as might be found in special collections (Schenk, 2018). Description in

archives is somewhat different from the bibliographic model in libraries in that it is not only designed to facilitate access but to be a part of the record keeping that archives track (Duff & Harris, 2002).

The value of provenance in archives is enacted both in preservation of order as a physical arrangement of materials, which demonstrates their internal relations, and in the documentation of their lineage of creation and care. While original order is not always so foundational to notions of stewardship in museums, provenance is similarly documented in registrar's records and sometimes in descriptive notes. This form of contextualization validates the item as not only authentic in what it claims to be, but as a valid member of a collection. As CHIs reckon with their colonial pasts, many institutions are now in the process of repatriating items to their communities of origin. Documentation created to contextualize items as authentic can also serve as evidence of their fraught histories. New approaches to this documentation, such as allowing for multiple descriptions for different audiences, can allow CHIs to provide new forms of care for materials held (Glass, 2015).

It is not necessary that CHIs commit to organizing materials in accordance with the traditions of Western bureaucratic institutions. Critical scholarship, particularly from queer and Indigenous perspectives, has pointed to the ways that prioritizing care of collections primarily in terms of preservation and access has created paternalistic feedback loops that do not serve the needs of the communities from which or about which many collections are formed. Alternative ways of contextualizing items range from changes in terminology to development of new KO systems that serve specific communities (Moulaion Sandy & Bossaller, 2017). Within existing infrastructures, such as bibliographic subject headings and classification systems, we could provide more accurate, expansive, or just taxonomies to represent items, allowing them to be accessed and understood in a way that both represents their content and meets the needs of users (Adler, 2016). This can include expanding our terminologies for describing items across platforms (Cifor & Rawson, 2022), or developing local taxonomies to suit the needs of collections and users (Bowe chop & Erikson, 2005). While community archives and knowledge systems can provide and control access to materials and information to advocate for just representation (Duarte & Belarde-Lewis, 2015), there may also be circumstances in which non-participation or silence is an appropriate response to the impulse to collect and curate (Carter, 2006).

4.5.3 DESCRIPTION FOR STEWARDSHIP

Stewardship has been discussed here in terms of maintenance, which secures the availability of a collection for users; preservation, which attends to the stability of items as material; and contextualization, which aids understanding of non-material aspects. While there are doubtless many other forms of stewardship practiced in CHIs, these bring our attention to a range of motivations for care that may be present in descriptive practices.

Description highlights characteristics of both the item and the collection, advocating for their use as resources and for their resource needs. The user searching their local library's online public access catalog can find myriad resources by searching across the descriptions, whether their desired items are a selection of books on a topic or materials in a specific format. The provision of descriptions aiding this task is a form of maintenance, advocacy for materials to be available by users. The inclusion of these characteristics in the record is scaffolded by descriptive and terminological standards.

Stewardship, however, is not only oriented toward meeting the needs of users; it also attends to the preservation needs of items in the collection. Cataloging standards such as the appraisal elements of DACS or the condition and conservation elements of CDWA highlight characteristics of items that might need a particular resource, such as secure storage, allowing an institution to allocate resources according to the needs of an existing collection for the sake of preservation.

A variety of standards support the contextualization goals of descriptions. Classification schemes advocate for items to be understood as in relation to other things. Archival description standards help us to contextualize relationships between items and their creator through prescriptive arrangement and representation approaches. Museum and archival standards allow us to make statements about provenance and doubt or uncertainty. Terminological standards contextualize items by advocating for them to be understood as members of categories.

While stewardship is facilitated through multiple aspects of description, the structure and function of CMSs can shape both the content and access experience of description. The open-source CMS Murkurtu, for example, was designed with Indigenous community archival needs in mind and allows for "cultural protocols" to define what is included in a record—as well as who can view it (Mukurtu, 2022). This platform was built in recognition that stewardship for collections is not defined by all communities in the same way.

The care afforded to items via their description can facilitate user access, but stewardship may also prioritize limiting access through intentional restriction or through various forms of underdescription. Descriptive standards such as RDA, DACS and CDWA emphasize a thorough and accurate accounting of the salient aspects of an item. While they may not offer explicit guidance on how to represent (or when not to represent) information that might be sensitive, the procedure for which is usually locally determined, we can see recognition of the need for responsive approaches in the ways that they discuss the iterative nature of both the standards and of descriptive practice. For example, the introduction to DACS states:

Archival description is an iterative, ethical practice that requires continual engagement with core values. Rooting standards in values helps archivists enact these values consistently and makes them explicit to our user communities. (Society of American Archivists, 2020, p. xiii).

In its guidance on description of access restrictions, the decision to limit access is understood as having been made prior to description. The archivist, whose “judgment and interpretation” shape the finding aid, is reliant on their understanding of the needs of the users in facilitating access (Society of American Archivists, 2020, p. 2). Restriction is imagined to be regulated at the level of access to materials, rather than at the level of their representation.

The CDWA, while also emphasizing access and accuracy of description, explicitly addresses the possibilities of uncertainty and ambiguity in describing items, encouraging practitioners to follow the rules of the repository of an item while also allowing for notes citing any conflicts around identification of characteristics (Baca & Harpring, 2022). While this approach is not offered as an invitation to obscure or restrict representation, it does invite the possibility of a catalog record that cannot be read as a unified statement of identity.

Practitioners and scholars have considered approaches for handling cases where a form of care or consideration is required that contradicts the access-oriented approach of these standards. The relational approach called for by Littletree et al. (2020) in description of expressions of Indigenous knowledge contests the colonial contexts of Western KO practices and privileges the needs of the knowledge and the community from which it comes. Critically, the expressions here are not imagined to be static information objects from which anyone can extract value, but are seen as part of a network of relations. To practice description as a form of stewardship according to this approach would transform definitions of access and accuracy championed by most standards. While it might be possible to take a relational approach to description while using existing systems, one would have to employ additional or alternative approaches for interpreting what is present and how it ought to be used. This might be similar to the silence discussed and sometimes called for by Carter invites practitioners to recognize when to say nothing: “Unnatural silences must be combated by the archivist, but natural silences, those where the marginalized can assert their own power, must be respected (Carter, 2006, p. 228).” Such silences defy standardization.

Advocacy for privacy as a form of stewardship can also be seen in debates around the appropriate use of name authority control. The inclusion of demographic terms in catalog descriptions has raised concerns about who determines their use and whether they can be accurately deployed in the description of the creators of works. For example, the decision about when to include the term “African American” from the Library of Congress Demographic Group Terms (LCDGT) is not easily resolved by catalogers with limited time to investigate the self-identification of authors (Willey & Yon, 2019). Similar concerns about catalogers assigning gender identity terms arise in critiques of RDA, where misidentification and loss of privacy could both cause harm, and where limits to crosswalking across standards reduce inputs to binaries (Billey et al., 2014). For whom or what should catalogers serve as stewards? What relationship do works have to their creators, and to what extent should catalogers aim to sensitively represent them? Discussion of issues of name authority control have highlighted everything from colonial legacies in the description of

communities that are understood to exist (or not) according to geopolitical contexts, to the privacy concerns of creators whose works were not intended for general audiences (Sandberg, 2019).

The possibilities for transformation or intervention in description for stewardship are constrained by resources of time and labor. To advocate as a cataloger or a user for modifications to conceptions of access or stewardship requires not only a sense of possible approaches, but a vision for pragmatic solutions. What disruptions to existing functionality might be introduced by changes? From issues of technical interoperability to user legibility, modification to the way things are done can have a constellation of consequences.

4.6 SUMMARY OF ARCHAEOLOGY

Access and stewardship are but two of many values held dear by CHIs. Together they point to the relationship between users and items in collections, and to institutional priorities in serving each. They are both central motivations in description of collections, at times in tension. How best to describe a unique item in a way that someone will find it, and that it might be collocated with other items that are somehow related? Description, like collection, is always incomplete, leaving something out (Carter, 2006). To represent something fully would be to recreate it, an identity that is not only inefficient for facilitating access but offers no interpretation that might help us understand how items in a collection relate to one another (Furner, 2009). Therefore, we ask catalogers to understand the priorities of the institution, the needs of its users, and the particularities of its collection in rendering descriptions of each item. Each of these parties might have distinct perspectives and needs that relate both to access and to stewardship. Standards structure descriptions, attempting to direct a cataloger's attention to the most salient features that will allow them to represent items in a way that will serve this assortment of needs.

Enactment of these values in CHIs, from collection development to programming to cataloging, changes in response to resource availability but also to shifts in culture both within CHIs and outside of them. As a result, at any given moment there are several discourses that shape how collections in CHIs are handled. In our present moment, CHIs are reckoning with the legacies of colonization, with many institutions actively working to decolonize their practices. These conversations are brought new strength and rigor by communities that may not be considered primary participants in these institutions. Activism in various forms shapes pragmatic responses, from petitions to add and change subject terms, to advocacy for repatriation of materials to their communities of origin. At the same time, many sites are transforming how materials are displayed and interpreted as a response to critiques of exclusion. Public participation now occurs via intentional interactive design and through the conversations that happen outside of the institutional context, as in social media.

Our understanding of access and stewardship may be shifting away from a centralized authority disseminating vetted materials, toward a more distributed and relational model of knowledge sharing. At the same time, concerns about information literacy and disinformation have been taken up by CHIs, especially libraries with their educational capacities, which can lead to renewed attempts to control what can be accessed. Each institution will navigate the relationships between these concerns and ideals with attention to its own resources. These perspectives may not be legible in the descriptions that are created for items, which are necessarily limited in form. Where access and stewardship can be seen as broad values of a collecting institution, accuracy and interoperability might be understood as their descriptive parallels. If we can describe things accurately, they will be available to our users. If we want to be able to compare them and share them, they must be standardized efficiently so that we need not make sense of each one separately.

To be consistent in enactment of these values, CHIs rely on standards to guide processes from acquisition through description of collections. While these standards usually attend to specific aspects of this work and not to the entirety of the goals of these institutions, they can be seen as promoting values of access and stewardship through provision of rules that invite comparison between items, collections and institutions.

4.6.1 ARCHAEOLOGY AND AMBIGUITY

The decision to undertake this archaeology as a means of investigating ambiguity has struck me at times as explicating the obvious. Practitioners in the field are intimately familiar with these strata even if they don't think very often about the relationships between them. The work of cataloging requires an attentiveness to procedure and routine, a recurring temporal engagement with items and the tools that structure their description. It is this routinization that made this archaeological endeavor worthwhile.

As was the case of disambiguating the language of the discipline, such as separating the meanings of *item* and *resource*, parsing the boundaries of these strata allowed me to expand my definitions of ambiguity by separating out the subtle distinctions between values and rules, or tools and their uses. Rather than ask simply whether it is a matter of uncertainty about an item, I can now ask how ambiguity might be a signal of conflict between values, or an issue of interoperability. In the final section of this chapter, I consider what it looks like for a cataloger describing an item to navigate these strata and ask how ambiguity might be identified in the process.

4.7 Making Sense of Descriptive Processes

I have outlined an archaeology of description that suggests an interplay of values, standards, and cataloging systems that shape the representative records we create for items in collections. Tensions and frictions between them may be seen as sources or sites of ambiguity. Yet this

accounting of description has not attended to the actual process of cataloging, the temporal experience of describing an item. The model I offer here can be used with the taxonomy of ambiguity introduced in Chapter 2 to identify a variety of sites and types of challenge that might be characterized as ambiguous.

4.7.1 CHAIN OF SURROGATION MODEL

To clarify my research questions about ambiguity in structured description and disambiguate terms that often used interchangeably, I developed an institution-agnostic model of this work informed by cultural heritage cataloging practices. I call this the *chain of surrogation*. A surrogate is a stand-in for the original thing. While the term *proxy* is similarly used, the relationship between a thing and its surrogate suggests a slightly more intimate relationship, where proxy is often associated with substitution. Despite this choice, both terms are relevant to discussions of the work that these descriptions do, whether we call them catalog records, finding aids, or something else.

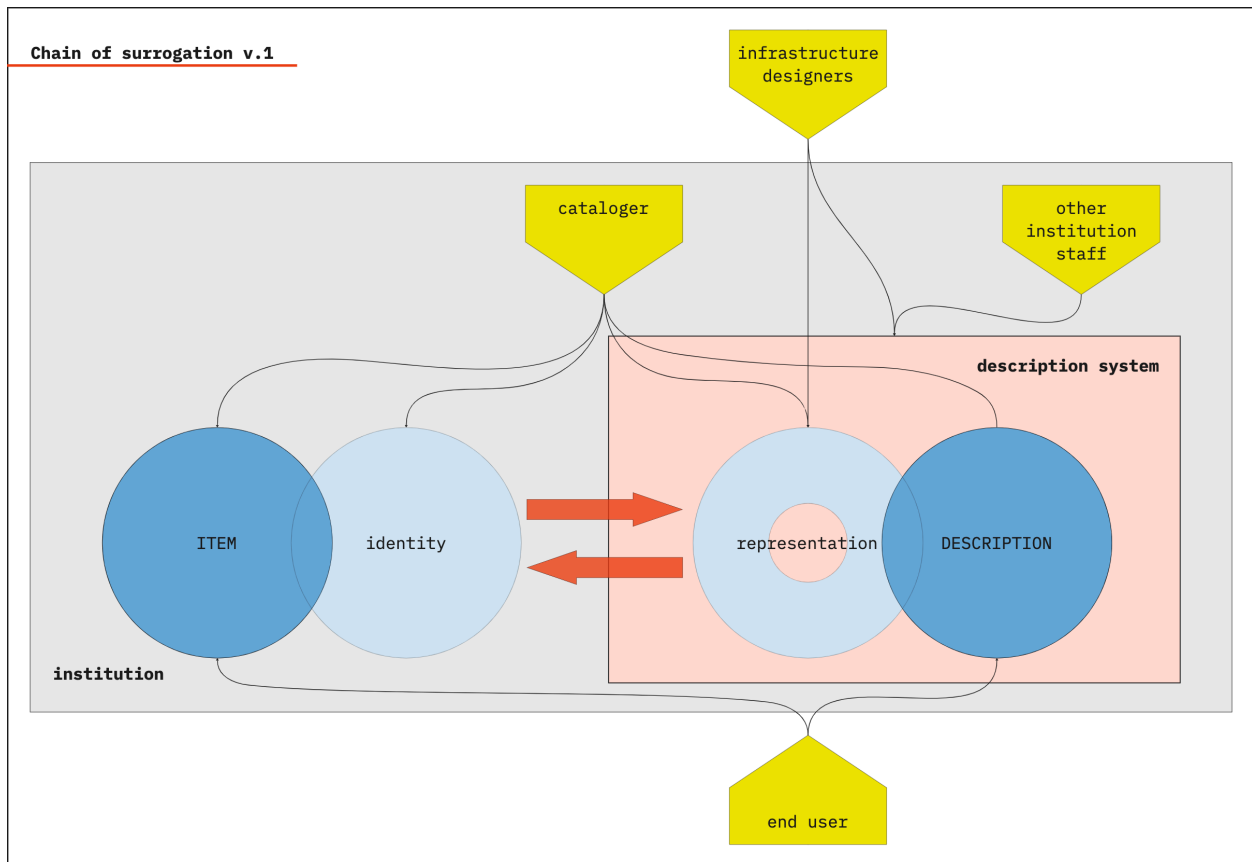


Figure 2.1: Diagram of the chain of surrogation model, version 1. This model shows the relationship between an item and its surrogate as a conceptual and material process with many participants.

This model is very simple. Many practitioners will have a different way of thinking about the work they do, or a different order in which they perform these steps. Because this was originally intended as a guide for internal consistency in this work, narrow meanings are assigned to each term. In common use there is a high degree of overlap in their definitions, and alternative terms may be favored in some domains. Nonetheless, scoping definitions allows us to notice differences between these stages that are often blurred when they are treated as synonymous.

The chain of surrogation contains two concrete things: the **item** and the **description** of the item. To create the description, the cataloger must consider the conceptual **identity** of the item and navigate the **representation** rules that govern and constrain description in the system.

4.7.1.1 Item

An item is the thing that needs to be accounted for in a system. In CHIs discussed in this work, an item is part of the collection; description through cataloging will both create an inventory record of this item and facilitate its future access by marking its salient features. This may be a physical or non-physical item (a book or a digital file, for example). In libraries, items are typically thought of as information-bearing objects such as books, documents, or media such as films or audio albums and are often referred to as *resources*. In archives, the item is the unit that needs description via a finding aid, usually called a *collection*. The item in this case may include any number of component materials, which may or may not be individually described within the record. Items in museum are often called *objects* or *works*. In other systems, the item might be referred to an individual, person, unit, record, document or exemplar. When a cataloger begins to describe an item, they might have some sense of why it has been added to the collection by the acquisitions staff. Their job is to help others make sense of it in the future.

4.7.1.2 Identity

Upon encountering an item, a cataloger asks some form of the question, “what is this?” While some items provide answers to this question in the form of titles or other labels, the cataloger must also determine what the item is in relation to other items, how it might be categorized. In Chapter 2, I pointed to dual understandings of *identity* in representation. We can see identity as highlighting the characteristics that make each item unique, in which case identity that which is identical, that is, exactly the item; or we may see identity as membership in a group based on characteristics shared across items. We understand both approaches as valid and try to reconcile them by stating both what is different about an item in relation to other items and highlighting how it is most similar to other items. Both approaches to identity attempt fidelity to the item itself.

Identity may be determined by the item itself in whole or in part (a book, for example, has many identifying characteristics; a person can state their identity, which still may consist of both unique and matching conceptions of identity). In other cases, the identity must be established by the person doing the description and categorization work. Determining identity requires observation of the item and mapping it to the representation system.

4.7.1.3 Representation

Representation is the goal of a description system, marking the presence of an item in a collection. As seen in this chapter, it is governed by a constellation of values, standards and technical infrastructures that determine both what is desirable and possible to render as description. Since representation facilitates access to the items, a cataloger considers not only their initial conceptions of the identity of an item, but how it would be most readily accessed (Sauperl 1999). Description is deemed successful by a variety of measures including accessibility, but also efficiency, interoperability, accuracy, stability, and warrant. While the infrastructures of representation might seem concrete, decisions about how to interpret them in rendering the identity of an item can be seen as a conceptual stage prior to the final descriptive record.

4.7.1.4 Description

Catalogers rarely control the rules and tools that guide representation, yet their choices in interpreting and utilizing them shape the description or surrogate of the item. A description attempts to render an identity for an item in accordance with the representation goals and rules of a given system. The descriptive record becomes the point of access for future users, allowing them to discover what is present in a collection, whether or not they are interested in obtaining an item. The catalog, as the sum of all records, is the representation of the collection. In aggregate, descriptions describe a collection as collocated categories. The quantity of items in a category shapes how we see the *aboutness* of the collection. The catalog functions as a tool for institutional self understanding, allowing administrators to allocate and advocate for resources based on what is present (or missing) from the collection.

4.7.1.5 Participants

While the cataloger or description practitioner creates the descriptive record, their work is informed by other participants, individual and collective. First among them is the *institution*, with its assorted goals and resources, from acquisition budgets to storage space. *Infrastructure designers* shape the policies, standards and technologies that scaffold the catalog. This work is mostly done outside

of the site of the collection, with little to no knowledge of the items therein. Navigating these infrastructures, the cataloger attempts to facilitate access for an *end user*.

The cataloger usually has some notion of the end user based on the mission and history of the institution but can never anticipate all possible user needs. Most end users engage primarily with descriptions, sometimes to access the item itself. The logic and rules of representation are usually invisible to them and thus inscrutable; their ability or inability to find items they seek is the primary way they can assess the quality of descriptions.

Finally, while we rarely see *items* as participants on the level of the humans who describe and use them, we might see some items as participants in the description process, especially in cases where materials are closely tied to communities that are actively engaged in the representation needs of cultural materials.

4.7.2 SUMMARY OF CHAIN OF SURROGATION

This simple model treats description as a temporal and conceptual process and demonstrates the relationships between participants that may never directly encounter one another. Were we to locate the strata from this chapter in this model, the values and standards could nest in the stage of representation, while the management system would be the containing membrane that explicitly structures the resulting description.

Using this model, we can readily note a range of challenges in surrogation, asking in effect *whose fault is ambiguity?* For example, if the challenge came from the item itself, perhaps due to some structural compromise such as a missing cover or title page in a book, we could mark the item as the site or source of ambiguity. If the material was sound but the cataloger didn't understand it, had no frame of reference due to unfamiliarity, or was rushed in their assessment, we might mark the *identity* link as a source of friction. If the cataloger had a good idea of what was present, but the standards made it difficult to represent, we could mark the *representation* link, with a note as to which standards or structures inhibited the ideal description. Finally, if the record itself is experienced as ambiguous, probably to an end user, we could mark the *description* link.

The chain of surrogation can capture a constellation of challenges in creating a surrogate for an item, signaling limitations of both infrastructures and participants. Frictions signal potential sites of ambiguity but do not describe them further.

4.7.3 CHAIN OF SURROGATION + TAXONOMY OF AMBIGUITY

The taxonomy of ambiguity, introduced in Chapter 2 and reviewed in the table here, describes varieties of ambiguity characterized by their sources and consequences. Sites of friction

can, in some cases, be further described as examples of these types of ambiguity. Bringing these two frameworks together, I can begin to describe examples of ambiguity and compare them.

TAXONOMY OF AMBIGUITY	
Taxonomy description	In the classification and cataloging literature, disambiguation is the practice of determining the precise identity of an item and describing it in such a way that each item is clearly distinct from similar others. Ambiguity is rarely discussed directly, and is mostly treated as the state of uncertainty before disambiguation is complete. Additional conceptions of ambiguity as it relates to descriptive practice can enrich our ability to intervene appropriately when we encounter challenges in the work of representation. The following examples of types of may locate the experience of ambiguity with the cataloger, the end user, or with the item itself.
Ambiguity type 1	Simultaneity
Description of simultaneity	Simultaneity is a characteristic of an item that has multiple identities or primary characteristics. Examples include but are not limited to anthologies, mixed media works, some archival collections where unlike items are grouped, multi-lingual works, interdisciplinary scholarship, and genre-defiant works. Representing these items may be possible through strategies such as employment of multiple subject headings, which is not allowed by all systems. Even when compounded representation is possible, it may not adequately represent the collective nature of these identities. Items that have this characteristic are inefficient to represent and may be difficult for users to parse.
Ambiguity type 2	Uncertainty
Description of uncertainty	Uncertainty, the most common conception of ambiguity in description systems, describes an experience of the cataloger or, potentially, the end user. Uncertainty signals a lack of critical information or understanding, which could arise from many sources including missing metadata, item damage, illegibility due to lack of language capabilities of the viewer, historical contexts, or emergence of new ideas or terminologies. Ideally these uncertainties can be resolved through the acquisition of clarifying information, but lack of resources to support resolution of uncertainty prevent many of these issues from being addressed. In some case, lack of information is not resolvable.
Ambiguity type 3	Residuality
Description of residuality	Residuality describes the condition of identities that are difficult or impossible to accurately represent using the infrastructures of structured description. The term, drawn from Star and 7(2006), highlights the ways that representation systems can misrepresent, not only by exclusion and mis-naming, but by reifying as certain and permanent identities that may be in flux across time or location. While some residualities can be ameliorated by changes to an infrastructure, all systems will render some things residual. Whether this condition is perceived as a problem depends in part on the resources that are associated with representation in that system.
Ambiguity type 4	Strategy

TAXONOMY OF AMBIGUITY

Description of strategy	Strategy is an intentional act of representation that does not follow the rules of the description system. While the description of something that has deployed ambiguity in this way may not be understood as accurate, it may serve as a means for advocating for some resources desired or required in relation to the item. This approach has been discussed in relation to items held by museums that are from indigenous communities. In some cases, communities have asked that institutions describe these items differently for the public than they would describe them within the community. Whether this approach is implemented through omission of some metadata or by using entirely different names for things, strategy can allow for representation while also securing privacy.
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Table 4.2 The taxonomy of ambiguity introduced in Chapter 2 is summarized here. It includes four primary types: simultaneity, uncertainty, residuality, and strategy.

These models were used in the following phase of this research project as tools for talking with practitioners about their work. I will present modifications to the chain of surrogation reflecting practitioner experience in Chapter 6.

The approaches we take to resolving the challenges of representation will depend in large part on where and to whom they are most apparent. This project does not set out to solve the problem of ambiguity by eliminating it, but to surface those cases where resolution is possible and desirable. Where it is not, we can think more deeply about our motivations toward and approaches to representation.

4.8 Conclusion

This chapter considered the terrain of description beyond the immediate tools that structure records, identifying multiple social and technical infrastructures that shape descriptive practice. At the most visible level we see the management systems, usually software, into which records are entered. These systems are often informed by and incorporate myriad standards, including disciplinary, descriptive, terminological, and encoding standards. The design of each of these infrastructures is shaped by values of professional practice, of institutions, and of CHIs broadly—each of which is shaped by social and economic assessments of the value of these institutions.

I considered two values in particular, which are sometimes in conflict: access and stewardship. Exploring how they shape descriptive practice—and how they shape evaluation of description, we find some frictions. Practitioners must navigate not only visible software and embedded standards but must evaluate their strategy in handling difficulties through engagement with social infrastructures, traces of which are embedded throughout description systems. Every description both inventories and advocates. Practitioners attend not only to the item and its user, but to institution as a valuable resource in need of resources.

5 Interlude: Constitutive Ambiguity

I'd like to think that being seen doesn't always fit easy delineation—neither the who, nor the how.

(Horn, 2022, p. 89)

5.1 Introduction

I began this project with the claim that disambiguation is the goal of description and asked what ambiguity might be, given the commitments of this practice. Drawing from the literature of bibliographic classification theory, I showed that ambiguity has been attributed to several issues: temporary ignorance of a cataloger; the messiness of context surrounding facts; inadequate faceting; singular statements; unclear warrant; domain-agnostic classification.

Expanding our view from the pragmatic practice of cataloging to the network of infrastructures that support it, I further suggested that ambiguity could be described as a kind of friction between the strata, experienced not only by the cataloger but by other participants in the institution. Combining the ways that both the characteristics of an item and the structures of description scaffold our ability to understand or to assign identity, I offered a taxonomy of ambiguities with their consequences and potential ameliorations.

In this chapter, I will extend my consideration beyond the catalog, to ask whether there might be other kinds that present challenges to description. The pragmatism of cataloging requires that things be accessible and efficient, as well as accurate. While I would suggest that some forms of ambiguity may remain unresolvable in cataloging, thinking of ambiguity in terms of design allows us to experiment with approaches to working both with it and for it.

5.2 Certainly Ambiguous

Critical cataloging literature offers numerous considerations of the ways that human identity has been handled in description, often drawing attention to the harmful or exclusionary language of both classification schemes and CVs, where both terms and relationships between them shape our ability to represent the world (Adler 2016; Fox, 2016; Olson 2008, 2002). Yet these infrastructures have limited ability to help describe identities that defy or resist names. In introducing the term *residuality*, Star and Bowker help us to think about cases that are more ephemeral, where identity

may be contingent, ebbing and flowing through time or space. In their discussion of the chronic pain with which Star lived, they asked not only what it means to be represented in a moment, but what might be done with that representation (Star & Bowker, 2007). What does it mean to reify an identity that is not stable?

I would like to extend this question by asking: what might it look like to represent an identity that declares itself ambiguous? The reader might reasonably protest that such a state is impossible, or rare, or non-applicable to institutional contexts of this field, in which we are usually describing items that have been added to a collection for a reason. I will join the reader in this skepticism momentarily, except in regard to the first statement concerning the impossibility of such a state. In this I am confident; in this I have experience.

I came to this research question not only because I was interested in edge cases of description, but because I have been ambiguous for my whole life. I had hoped that in undertaking this research, I would find proof, somehow, of my experience from the evidence of my data, and that in finding it I could avoid speaking of myself in the first person. Instead, I have found an assortment of examples for comparison that are often just as blurry as my own. The blurriness prevents me from interpretation, and so I must resort to including myself here as a specimen of ambiguity.

Briefly, my biography: I was born in the late 1970s in California to parents whose union was unlikely. My mother, a redhead who had grown up in a Rockwellian version of wartime and post-war Ohio, had joined the wave of countercultural young adults in San Francisco in the late 1960s, abandoning most conventions in favor of a series of experiments in living. My father, 12 years her junior, had been born in Washington D.C. while his South Indian parents studied at Howard University before returning to India with their American-born sons. A decade later his family returned, settling in the mountains of Southern California, where my father eschewed both Indian and American traditions and moved in his own free-spirited way, which was outside of the countercultural scenes my mother inhabited. They met when renting rooms in the same house near Golden Gate Park. I was their only child. When I was a toddler, my father was in a boating accident and lost at sea. My mother and I continued to live in the university town they had moved to for his graduate studies, among hippie types whose grand experiments in living during the 60s and 70s had mostly ended, but whose unusual sensibilities prevailed.

I was not raised in regular contact with either of my parents' families. I do not resemble my mother. Asked regularly, "what are you?" I had no clear response. The best I could do was come up with a clever quip that would embarrass a person for asking, but these replies gave neither me nor the interrogator any sense of an answer. In the United States, where racial identity remains central to the lived experience of residents, whether or not they feel the need to examine or claim it, I was perpetually reminded that I appeared ambiguous to others. When I replied with something resembling a factual answer, something like "My father's family is from India and my mother is a

redhead from Ohio," I was often asked about our family culture(s), yet I had little to say that aligned with the intention of the question. My family was my mother who spoke to few people, with whom I lived in an apartment or shared house, depending on what was most affordable at the moment. There was no sense of inheritance or membership, so the true answer felt like a lie, but without any sense of what could be more genuine. I was ambiguous to others, but also to myself. To represent me by assigning me membership in whole or part to recognized identity groups was to erase my experience of ambiguity in a context where it mattered. To represent me accurately was to misrepresent me. My ambiguity was, is, constitutive.

While this tale of constitutive ambiguity may sound bitter or despondent, it was not only experienced as such. Direct interrogations of my identity were sporadic; most of the time I encountered a variety of more subtle reminders of the ways that my appearance shaped how I was making my way through the world. I occupied states of being without language, became comfortable in the unknown, even with being uncomfortable. When I wished to, I was able to claim and explore my component halves in a variety of ways, even as I strained to cohere. In travel, my ambiguity was and is sometimes an asset: in less-white areas, I am often seen as a member of some other group. When I lived in New York, I was told where "my people" were on multiple occasions, having been pegged as Syrian or Columbian or Egyptian. I was welcome in this visible invisibility. Passing as recognizable to others allowed me to be present, to delight in an occasional confusion of intimacy.

As I grew older and moved out of my home community and into a life I had not anticipated, my ambiguity not only remained but extended along different characteristics of privilege, class, education, gender, and parenthood. Transformations of these sorts are common enough, though they might not be experienced as ambiguous to people who have experienced a sense of membership or identity at some point in their life. I do not pretend that my ambiguity along all of these axes is as constitutive as my racial identity. Nonetheless, I have occupied and continue to occupy perpetual liminal zones that are parameters of my experience. I still struggle to know how to represent myself on forms and in conversations.

Yet since the beginning of this research project, I have come to recognize that more than wishing to maintain and mark my ambiguity, I want to be able to advocate for, with, and through it. I want to understand when and how this ambiguity should remain defiantly outside of category and when it can instead claim membership, collocating me with others whose identities might defy convention—or whose needs are similar to mine.

In the taxonomy of ambiguity introduced in Chapter 2, I drew on the concept of residuality to capture ambiguities that are present due to identities that trouble the logic of the system of representation. I would like to amend the category of residuality to include the often-perpetual state of constitutive ambiguity. Like contextually contingent identities, constitutive ambiguity does not

prevent one from representing anything about an item as a means of counting or advocating for something about it. But the fixity of the record reifies and thus misrepresents a misfit as a hospitable one.

5.3 Ambiguity As Form

Of course, edges and misfits have been the subject of rich discourses around identity outside of the domain of catalog description. From Gloria Anzaldua's *borderlands and Mestiza consciousness* (1987) and bell hooks's work on *margins* (1989), to discussions of gender and sexuality laid out by both scholars and activists around terms including transgender and queerness, the existence of identities that could be described as ambiguous has been well documented and theorized. These discussions often emphasize the role that power plays in generating ambiguity. This view is tidily summarized by Mark Johnson, as cited by Valentine:

"There is nothing ambiguous about ambiguity, sexual or otherwise. Rather, ambiguity is the specific product or effect of different historical relationships of power and resistance through which various cultural subjects are created and re-create themselves" (Johnson, 1997).

While I do not disagree with this analysis and understand its importance in considering the ways that categories are used in systems, I want to give attention to the experience of ambiguity. In occupying a place of ambiguity, not as a confused observer but as one whose identity is complicated by and complicates categories, one is not always looking at the source of this constitution. Most of the time, one is simply being. Thus, describing identity in relation to structures of power in some ways misses the point of the experience, mistaking accounting for representation.

When I began this work, I had hoped that I could avoid questions of human identity—my own in particular. I wanted to be able to demonstrate that this issue is germane to discussions of representation of non-human identities, that ambiguity is everywhere. Yet both description and the languages we use to assign identity are products of human invention. I lack the means to ask a periodical or a painting about its sense of its own identity as an individual or a member of a community. Recognizing the inescapability of discussing human identity in making my points about ambiguity, I sought to collocate myself along the facet of my constitutive ambiguity. Within the field of cataloging and classification, there have been robust discussions of representation of human identity, especially with regards to gender, race, sexuality and disability. For the most part, these have advocated for visibility and access in alignment with formulations of identity that reflect the language and needs of the communities described.

My own experience has similarities to those of trans-racial adoptees and third-culture kids (people who are raised in one or more cultures that are different from those of their parents). While I will not engage here with the rich conversations that attend to each of these experiences, they both

produce highly specific conditions of dis-ease and communion for each person. Though there is huge variation in the contexts for each experience, people who identify with these groups often describe an inability to escape the sense of confusion that others feel upon encountering them: they are reminded that they cannot fit in. They also note their own confusion upon encountering people who somehow resemble them but with whom there is no resonance of experience. Perhaps because the forms of alienation produced by these experiences are so variable, it is difficult to know how to advocate for representation around these identities beyond marking that they exist and are fraught. While the parallels between these identities and my own sense of constitutive ambiguity reassure me of the reality of my situation, my attempts to engage with them as sites of inspiration for thinking about description have only spun me deeper into the soft darkness of illegibility. My task here, however, is not to find belonging in non-belonging with others who don't belong; it is to consider whether this experience is relevant at all to the kinds of pragmatic description through which we order our collections.

Highlighting the limits of correction, Drabinki (2013), in her queer analysis of cataloging, notes that "...we invariably cannot account for knowledges or ways of being that are excess to and discursively produced by those systems" (p. 96). I recognize the limitations of our representation systems to eliminate the barbs and blurry boundaries which they produce and wish to think beyond the harms of the margin to explore how we might not only describe ambiguity but see it as an affordance. KO scholars have argued that description is a design discipline (Clarke, 2018), and that design can aid us in highlighting residuality (Feinberg et al., 2013; Feinberg et al., 2014). But what to highlight? Despite my desire to hold onto the notion of constitutive ambiguity, I draw inspiration from individuals and communities that have captured various category-defiant or -subversive identities, affirming their realness and articulating qualities and perhaps suggesting characteristics of identity that are worth preserving, highlighting, and exploring as affordances in the work of description.

5.4 Ambiguity As Experience or Characteristic

In discussions of disambiguation in the field of description, ambiguity is treated primarily as an experience. A cataloger encounters some form of friction, whether by misunderstanding an item or being puzzled in the application of a rule or use of a tool. Resolution of the friction would change the experience and thus resolve the ambiguity.

Yet the possibility of constitutive ambiguity suggests a perpetually unresolvable friction, one that is inherent to the item and thus a defining characteristic. If our goal is only one of disambiguation, we might find constitutive ambiguity particularly troubling for its lack of resolution or coherence of membership. Yet it is not a given that ambiguity as a thing need be only alienating.

Considering the difference between external and internal framings of margins, bell hooks (1989) noted:

I make a definite distinction between that marginality which is imposed by oppressive structures and that marginality one chooses as site of resistance - as location of radical openness and possibility. (p. 23)

While she offers two formations of marginality, we can see that they are not entirely separate. The experience of marginalization imposed coexists with recognition of realities created in that space. The choice transforms the experience into something, or somewhere. I am interested in holding onto the relationship between the structures and the pockets of space they leave.

Further, to be ambiguous, to have ambiguous characteristics, does not mean that one is without any characteristics that are recognizable in the system, or to oneself. We need not imagine a vacuum where non-belonging orders existence to justify or prove the reality of ambiguity. Nor must we carefully trace every tendril of alienation to advocate for or through identities that transverse the prototypical center.

5.5 Liberatory Ambiguity

In starting this project, I wanted to argue that ambiguity can be liberatory, that being outside of category allows for a range of possibilities, perhaps akin to the radical openness for which hooks advocates in the margins. In an embodied way, this was a yearning for the possibility of movement without interrogation, but also a sense that such a possibility would open up something beyond a reprieve from scrutiny. A distinction began to emerge for me between a functional kind of liberty and a more conceptual liberation. Liberty here is a very simple sense of freedom: I wanted to be without being reminded of how I am perceived, which is another way of saying I wanted the comfort of being assured of my right to be present. Approaching liberty cynically, I can note that this desire is one of passing. While passing is often associated with being identified as a member of a majority or normative center, and with gaining access to the resources available to that group, my sense of and interest in passing has extended as well to non-majority margins. Passing in this case was other-than-isolation.

In liberty we might have access to the known world; a liberatory experience extends beyond, inviting us to find the unknown, to make anew. A liberatory identity does more than allow for access to resources, but facilitates discovery and creation of resources, remaining defiant even while investing in the concrete. It does not seem interested in passing as anything, but in being.

5.5.1 NONBINARY: IDENTITY IN CONTEST WITH CATEGORY

My own language for this distinction between liberty and liberation has felt inadequate, largely because I have spent my life talking to myself. I did not undertake this project under the

illusion that my ambiguity was unique, but because I wanted to explore and explain how it is commonplace. Seeking ways of talking about the liberatory aspects of ambiguity where categorization is central to identity, I was drawn to discussions of nonbinary gender, which directly contests the value of gender sorting. I was interested in hearing how nonbinary individuals viewed the category of nonbinary, whether it was an opting-in to that category or an opting out of male/female as discrete identities. I wanted to understand how they saw this identity as liberatory, as well as to hear how they experienced challenges around it, especially in regard to representation in information systems.

In pursuit of these conversations, I sought interview participants who would be willing to talk to be about their concepts of nonbinary and their thoughts on the ways that information systems handle gender and sex demographic information. I spoke with six individuals who shared wonderful articulations of how they experienced and made sense of gender as a concept. I provided examples of sex and gender elicitation forms I had come across, and they talked through their questions about and suggestions for them. While everyone I talked to emphasized the reality of their identity, each person had a unique view of what was difficult or liberating about categories. In critiquing the ways that information systems attempted to elicit gender data, few participants expressed the same views of what was appropriate or ideal. The variety of responses they had to my prompts clearly demonstrated the liberatory characteristics of living as a nonbinary individual, but there was no unified narrative of liberation as directly related to rejection of the category of gender. Instead, they expressed a range of practices that were liberatory. Central to these practices was participation in community. Several participants identified queer culture as their space of liberation; however this category rejects rigid constraints in expression and behavior, it still unites those who are drawn to the values it contains.

In trying to make sense of what it could mean to identify in opposition to a category, I sketched out three possible relationships to binary categories, which somewhat mirrored my taxonomy of ambiguity (Figure 5.1). The first echoed simultaneity, emphasizing an identity that encompasses characteristics of multiple subcategories, in this case masculine and feminine, at once, all the time. The next might be best characterized as residual, where the distinctions between subcategories are recognized and valued as distinct but where an individual identifies at different times more with one or another. The final sketch might best be understood as strategy, when an individual rejects the subcategories and perhaps the primary category altogether, opting out, saying either “I am neither” or “This whole concept is bogus.” The people I spoke with, admittedly a very small sample, identified with all these sketches, though almost all considered the residual version to be a distinct identity, which two people described as gender fluid.

The questions I was asking were necessarily fixated on the category, rather than the lived experience of nonbinary embodiment and expression. However frustrated or confused they might be in encountering forms that collected demographic data, the lack of resonance between their lived

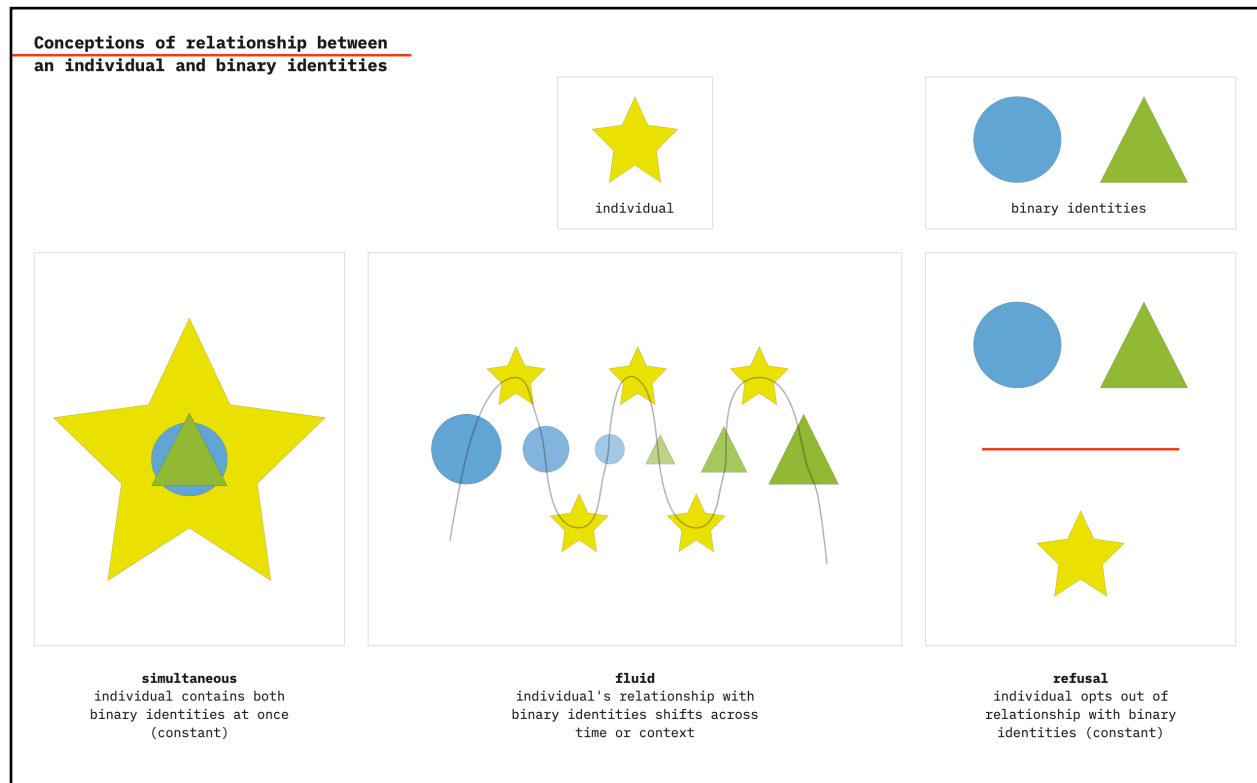


Figure 5.1: Model of three possible relationships between an individual and binary identities. The first is a full and simultaneous identification with both. The second is a temporally or contextually fluid movement between them. The third is a refusal of both.

experience and these limited and limiting systems was only temporarily experienced. They knew who they were: the friction and unease of encountering category structures encoded in forms was primarily expressed in terms of self-advocacy and trust (or lack thereof) of the institution soliciting answers. Why did they need to know? Who would have access to these representations and what sense would they make of them? What resources would become available or unavailable as a result of ticking these boxes? What resources remained unavailable regardless of how one answered? While these interviews did help me think about the affordances of these systems, they did not equip me with a more robust way of talking about the liberatory nature of category defiance. They reminded me of something that I was perhaps too eager to leave aside: regardless of identity and category, we want to find a hospitable place where our needs can be met, and to extend that hospitality to others.

5.5.2 REPRESENTING AMBIGUOUS IDENTITY

Self-representation on demographic forms is, of course, distinct from description of items, even those which one finds resonant in some way with one's own identity. My interviews did not include any item-description activities, so I do not know how the people I spoke with would respond to the task of representing materials that in some way might align with their identities.

Scholarship examining description of diverse gender identities in collections has highlighted the need for representation using language that reflects community use. In recent decades, additions and revisions to major classification schemes and CVs such as LCSH have reflected literary warrant, changing as more materials have been published about concepts known by particular terms (Adler, 2009). Beyond these major infrastructures, activists have led the development of robust and nuanced vocabularies to support description work for materials related to gender and sexuality, from the use of folksonomies in tagging in social book platforms to the Homosaurus, the linked data vocabulary. To represent the experiences of LGBTQ+ communities, the Homosaurus includes terms not included in LCSH, such as 'LGBTQ+ Adoption', highlighting the ways in which identity is not only a function of naming an individual but of describing the particularities of their experience (Cifor & Rawson, 2022). Providing granular terminology for describing items facilitates their discovery and use; the pragmatic aim of description centers on the ability of users to find what they are seeking. Beyond this function, however, representation is a means of securing visibility, reifying that which was previously muted and thus invisible both to those who sought it and those who might have not believed it was real.

When we self-identify, we can make sense of what we intend to represent, even if the system we are working with does not reflect our preferences. We may have to decide which is the best option in each situation, even if we would mark ourselves differently in another context. Although we might wonder how the administrators on the other side of the form will interpret our answers, we can provide a rationale that is borne of our own experience and needs. When we describe items that are not our own, however, our interpretation, shaped by our understanding of the world, can suggest the presence of identities that are less than certain. In their discussion of description of archival images with subjects whose gender sparks questions, Travis Wagner suggests retention of a kind of ambiguity that recognizes the desire for visibility and representation while also honoring the unknown aspects of the material at hand.

Subsets of queer identity seek out any representations that will help make legitimate identity, even if it means denying another identity in the process. The question almost always becomes an either/or identity instead of offering up the potential of a this/and identity description. Undoing this need for uniformity might liberate the transgender image within visual information. (Wagner, 2021, p. 30)

In our quest to render visible that which has been marginalized, to provide access using the language of the present, we might also consider ways of retaining ambiguities, even if the plurality of our descriptions in some sense reambiguates the subject as well as the collection. We might do well to remember, too, that even those categories that are developed to support and advocate for identities that have been at the margins requires the consolidation and scoping of that concept in ways that might not be legible to those described by the term. In his discussion of the deployment of the term *transgender* through the 1990s, Valentine shares myriad examples of individuals whose

identity would fall under that category but whose own experiences and names for their identities challenge the boundaries of the term. For all the advocacy that the term allows, Valentine (2007) notes, “my concern here finally is that the young, the poor, the people of color who are understood as being transgender are increasingly having to un-know what they know about themselves and learn a new vocabulary of identity” (p. 135).

While I believe it is worthwhile to consider how temporally contingent many identity terms are, I don’t want to suggest that they are all more harmful than invisibility. Instead, I want to consider how we might recognize the limitations of the terms we use and remain sensitive to the possibility that there may be times when a little quiet is needed. In contrast to, but complementing, the abundance of identifiers offered by Wagner, archivist Rodney Carter (2006) considers the role of underdescription (or even absence of collection) for items, suggesting that “unnatural silences must be combated by the archivist, but natural silences, those where the marginalized can assert their own power, must be respected” (p. 228).

At some point before I began these interviews, I was warned by several people that I should take care not to be too hasty in exporting statements about representation of human identity to contexts where representation assigns identity to non-humans. Be careful not to treat people as things. This warning was appropriate, not only because humans are not objects, but because catalog records are rarely sites of self-representation. However true it might be that ambiguity is everywhere, it does not follow that my experience is transferable to an artist’s book. The challenge of doing this work has been staying on topic, reminding myself of the exceedingly limited scope of a catalog record relative to the world of concepts, characteristics, and identities. Yet as I consider the limitations of representation, I am struck by the feeling that while we continue to treat people too often as objects, we might also too often treat objects as objects. That is, we imagine that we are dynamic, and they are static, that our ability to observe and name them is a steady function of our complex nature relative to their simplicity. While I am not interested in arguing here for a new materialist exploration of the world of stuff as perhaps more than still, it seems worth troubling or at least interrupting our habits of presuming to know absolutely what we behold. Disambiguation assumes and implies certainty.

This digression is not terribly useful in thinking about cataloging and description, something catalogers could have told me at the beginning of this journey. But I could not abandon these distinctions as irrelevant while developing this taxonomy of ambiguity. While the catalog may be a site of liberty, where descriptions both represent and advocate for resources, description is not liberatory in itself. Although I have abandoned my attempt to argue for liberatory ambiguous

descriptions, I hold onto the valences of the term to remind myself of what can be meant by its possibility.

5.6 Description As Design

The discipline of cataloging occupies a peculiar category of its own. The duties of the cataloger are largely bureaucratic and learned mostly on the job, even if one begins with training in librarianship. While classification systems are heavily used and come to be understood well by those who use them, one need not be engaged with their theoretical underpinnings to use them as tools. The skill of cataloging is developed through practice, best supported with mentorship and collaboration with experienced professionals, whether or not one has formal training beforehand. While the notion of information science may be useful from a social sciences perspective, Rachel Clarke argues that librarianship is best understood as a design discipline, where one asks not “what is here?” but “what is possible?” (Clarke, 2018).

The language of *affordances* from the design world allows me to imagine building descriptive practices that allow for liberatory expressions of identity without presuming to facilitate them directly. An affordance is described by Don Norman, an influential design educator, as the “relationship between the properties of an object and the capabilities of the agent that determine just how the object could possibly be used” (Norman, 2013, p. 11). In discussing the catalog, we can see the record as the object, while multiple agents determine how the object can be used, from the system designer, to the cataloger, to the end user. While we can never account for the myriad possibilities that could arise from the input of such diverse participants, we can nonetheless understand that the presence of and legibility of the properties of the item are critical to determining what is possible. If we think about ambiguity as an affordance, then, we are considering how we might design descriptive practices that mark or make visible the presence or parameters of those properties, inviting users of these systems to reflect on the limitations and possibilities of any description.

Considerations of ambiguity as an affordance in the design world have largely explored the open-ended user experiences where instructions are underspecified, which can provoke anxiety— or invite creative response (Gaver et al., 2003). Popular work that has considered ambiguity from a design and cognitive framing has emphasized the development of skills in navigating ambiguity, whether untangling seeming chaos or using it to brainstorm (Holmes, 2015; Small & Schmutte, 2022). These works that have urged development of one’s ability to mine ambiguity for creative material are less interested in ambiguity itself than in disambiguating for a purpose. The difficulty of making use of the blurriness of ambiguity is no surprise, yet I wanted to find a way to retain that indeterminacy while still thinking about how one might find it functional.

5.6.1 AMBIGUITY AS FRICTION

While the concept of friction is most often characterized as negative, as a metaphor it offers a way of thinking about what might happen when one encounters ambiguity. In my discussions with practitioners about the difficulties of description, which will be discussed in Chapter 6, I found it was often easier to ask about points of friction about than experiences with ambiguity. While the terms are not quite synonymous, these questions allowed me to consider their relationship. Friction slows things down. The goal of many systems is to reduce friction, which could mean making things more intelligible for users, or reducing costs of time or money. As we will see in the next chapter, practitioners often point to frictions related to challenges in interoperability or translation. In her definition of infrastructure, Susan Leigh Star noted that infrastructures become visible upon breakdown (Star, 1999). These frictions of breakdown in a process or a tool alert us in some cases to resolvable system failures and in other cases to enduring ambiguities.

Without advocating for widespread friction, we might still see it as an opportunity to design for or with, directing the attention of participants to the possibilities and limits of description. In a paper on the affordances of friction in designing for civic engagement, Korn and Volda (2015) note that “the little obstacles of friction carve out space for reflection in the residue between activities and in doing so counter the stasis and complacency caused by typical infrastructures” (p. 5552). Whether or not such friction is intended, when examined there is a chance to ask anew: What is here? What is happening? What is possible? In the context of cataloging description, we could assemble a list of additional questions that might aid the practitioner in settling on an approach to representation. The presence of friction could also provoke questions about the ways that representation facilitates visibility—or can provide privacy. These questions might have pragmatic responses. Wagner (2021), for instance, suggests the inclusion of multiple close terms in the representation of gender in historic images, an inserted friction of reambiguation, reminding us rather than focus on singular identities, description can facilitate the recognition or imagination of a constellation of potential configurations.

5.6.2 AMBIGUITY AS AFFORDANCE

...maybe experiencing the world as less worded, as gesture, vivid image, can be seen not as lack but as resource.

(Horn, 2022, p. 166)

Ambiguity can be an affordance, not resolved but held or described. Description need not be antithetical to ambiguity. As stated previously, disambiguation implies a kind of certainty. Recognizing the inherent lack of interoperability between contemporary CVs and terms from the past, Wagner (2021) reminds us that “...the idea of fact or even truth remains limited by the

language of a moment” (p. 23). Representation of identity relies on the idea of uniqueness as separable fact. We might, however, practice forms of description that highlight or create bounded uncertainty, holding together disparate identities that collectively get near to the ambiguous identity. This is different than invisibility (though it may amount to such in existing information systems that don’t currently allow for this). If items that are uncategorized simply disappear, the affordance of ambiguity vanishes as well. Could we instead imagine description that signals possibility rather than represents identity?

The pragmatic realities of cataloging invite experiments in complex or compounded descriptions of the sort that Wagner suggests: an abundance of terms that triangulate identity without fixing it in one place. Other interventions through metadata could allow us to mark the limitations of our certainty or outline the contexts in which an identity declaration is true, which would itself introduce a kind of friction inviting the user to make sense of a description. For example, we might opt to mark the distinction between identification *as* versus identification *with* a category term. The former suggests more certainty on the part of the cataloger, while the latter serves a contextual purpose, advocating for understanding identity as related more to membership than to individuation. Where reambiguation is desired to provide privacy or to control who has access to specific components of a description, software interventions can aid in regulating what is visible to whom. While these approaches might enhance the accuracy of description in many cases, they still seek to disambiguate in some fashion, or to protect against harm. I would like to suggest that there may also be ways in which ambiguity can be an affordance, an invitation to explore, to experience, or to make connections.

In her development of the concept of *strategic ambiguity*, Ralina Joseph (2016) recognizes that playing with the boundaries of category can advocate for resources that have been historically denied to Black American women in particular:

Unlike the direct action of call outs, walk outs, pickets, or sit-ins, strategic ambiguity is a safe way to respond to racism that comes in a post-racial guise because it does not appear to upend the space. Strategic ambiguity is not silence or evasion; it’s a choice to take on a certain amount of risk, to play with fire, to appropriate something that is used *against* you and make it work *for* you. (p. 305)

The affordances of ambiguity have also been considered, in relation to communication in media, by cultural anthropologists Frauke Berndt and Klaus Sachs-Hombach (2015), who note:

The use of implicit ambiguity makes it possible to either disguise or resist power. In contrast, the use of explicit ambiguity is a political tool that either reinforces or obstructs hegemonic meanings (p. 281).

While their work does not attend to the forms of representation addressed in KO, they highlight affordances of constitutive ambiguity (which they formulate somewhat differently than I

have here) including the role it serves in “preventing unambiguous communication”(Berndt & Sachs-Hombach, 2015, p. 281).

Advocating for such possibilities of blurriness is not necessarily a suggestion that we should simply remove, hide, or avoid creating descriptions. To generate possibility, the table must be set for such engagements. A decade ago, I ran a creative writing community and noticed that several of the most inventive writers stopped tagging their work by genre. The act of opting out of a practice that was common in that space was in some ways an invitation to readers: enter the text and find out what it says to you. To engage with writing in this way was, as a reader, often surprising and delightful. Reading the untagged pieces brought me into deeper consideration of the text and the author: was this poetry? Fiction or memoir? The unease of not knowing was alleviated by the boundaries of trust that I had in the space where the works were published, but the delight was in my surprise.

The interface through which we discover items, whether software or shelf displays, facilitates these slower engagements. It is fair to argue that such affordances are not related to description, but to a different aspect of infrastructure design. Even so, recognizing the possibilities of such arrangements might invite us to find ways of describing those items which would especially benefit from direct engagement due to their unusual nature.

5.7 Description As Resource Advocacy

Stitching this emphasis on a deeper engagement with observation of items to the idea that we treat objects too often as objects, I have become invested in the complexities of advocacy entwined with representation. Not knowing yet what a best, or most ethical, or even most pragmatic way of representing ambiguity might be, I am interested in developing more expansive means of recognizing what resources are present and needed, both relative to the collection and the catalog. Even if we cannot faithfully represent the ambiguous, we can make clear what we are advocating for.

Description systems record the presence of an item in a collection, but representation is also an attempt to match items to resources. As a cataloger considers how they might represent the identity of the item at hand, they are acting as advocates for this kind of resource allocation.

Money is the primary resource in institutions, without which all operations will cease. Budgets control what is possible to maintain and expand (and, for that matter, are required to dismantle or downsize collections). Whether funds are raised through grant wrangling, tax levies, corporate sponsorships, or user fees, even the smallest and quirkiest collections require fiscal support to be available to users. Most other resources are advocated for through appeal for financial support, yet money alone will not solve all problems unless allocated effectively.

Labor as a resource is closely tied to money, in that institutions must have adequate budgets to employ people to work in an institution. Labor has multiple aspects, from time (how long will it take to do a task or a project?) to expertise (who can take on this task?); the presence of one kind of labor cannot readily stand in for all kinds of labor. Moreover, labor may be associated with specific tools, without which a task cannot be undertaken. From software for catalogers to microfiche readers for users to view materials, to advocate for something to be done by someone, the appropriate tools must be available.

Space is a resource directly accounted for in catalog records, as it relates to both where an item will be stored and how much space it occupies. It can be physical or digital. Limitations of space govern library weeding policy and set budgetary goals for acquiring new facilities. Like labor, space as a resource is shaped and made possible through a variety of means, from shelves to servers.

Preservation, which can be seen as related to both space and labor, is a resource of care given to items to secure their availability for future use. From climate-controlled stacks for books to locked storage for rare items, to restoration of materials that have degraded in some way, advocacy for preservation is conceptual and material. We might include in this resource the kinds of care for privacy that is required for certain materials.

Attention is perhaps the most conceptual resource we advocate for, while simultaneously one of the most important. A collection is designed to be known and to be used. The ways that we describe items advocate for their use, for attention to be given to them. The catalog as a whole similarly serves to draw attention to the collection and the institution, helping people make sense of what is there.

While many of these resources are advocated for through catalog description, we may not always be aware of how description serves as advocacy for these resources. A failure to advocate for necessary resources might result in what Kate Crawford has described as allocative harm, while misrepresentation could result in representational harm (Crawford, 2017). If we view advocacy as a design move facilitated by description, we might expand how we understand the resources available in an institution and approach our representation practices as a means of advocating for items, ambiguous or not, to receive the most appropriate resources-- individually and collectively.

5.8 Hospitality for Ambiguity

Having begun my exploration of ambiguity in description from the world of bibliographic description, I saw the highly structured approach to representation as hostile to ambiguity. I imagined that the narrative forms of description allowed in archival description could offer more room for partial or conditional representation. Yet narrative, too, can be totalizing and exclusionary,

as Duff and Harris (2002) warn us, and it can standardize the institutional perspective across descriptions in ways that fail to reflect the perspectives of items and users. In calling for hospitality or an opening up of the ways that archives are organized and described, they imagine a practice of description that is more permeable, allowing more participants to collaborate or intervene in representation (Duff & Harris, 2002).

What might it mean to create hospitality for ambiguity? Perhaps narrative can still be a useful approach, at least if the ambiguous is able to create that narrative. As Rawson (2018) notes, retaining the traces of the history of description can allow us to contextualize items for which we may never establish certain identity, reminding us that “uncertainty and subjectivity of this process is left out of the final metadata and, like the discarded slip of paper, researchers often lose those tremendously important traces of ambiguity” (p. 347). Ambiguation or reambiguation of the sort discussed by Wagner (2021) may also create hospitality for the ambiguous, whether via omission or abundance of metadata. Finally, we might enact hospitality by setting aside our desire to determine identity, instead understanding what resources are available in the terrain, and approach description as advocacy for resource allocation.

Regardless of the approach taken to offering hospitality, by viewing ambiguity as an affordance, we might undertake our own remediations when infrastructural interventions are not easy. Perhaps we can use friction as an invitation to pause, to enter the text, to turn things over.

6 Reflective Practitioners on Encounters with Ambiguity

6.1 Introduction

In the archaeology of description in Chapter 4, I situated the work of cataloging in strata of values, standards and management systems that constrain the way that a record takes shape. I offered a simplified model of the description process, the chain of surrogation, which allowed me to ask *where* ambiguity might be located. This question invites us to look for ambiguity not only as a characteristic of an item, or an experience of a cataloger or catalog user, but to see it as a signal of friction between these strata. In Chapter 5, I expanded on the taxonomy of ambiguity in Chapter 2 by considering forms of ambiguity that are antithetical to the project of structured description. In this chapter, I consider the experiences of 19 description practitioners across a variety of sites. I invited them to share examples of ambiguity or friction that they had experienced in their work.

I begin with an abbreviated overview of the study and its participants, further details of which are included in Chapter 3. I then consider the examples of challenges that participants shared through the dual lenses of friction and ambiguity, comparing which features and consequences are highlighted by each framing. Next, I share examples of the interventions that practitioners suggested as responses to these challenges. This is followed by a consideration of the work of infrastructure designers. I conclude by reflecting on how the experiences of these practitioners have answered my research questions and refined the design of my conceptual models.

Practitioner examples point to myriad sources of friction and types of ambiguity, which can be characterized as technical or ethical issues, or are the product of lack of resources. In the discussion below I will share examples from the field and consider how description is a design project that not only represents an item but fills an advocative function within and on behalf of the institution.

6.2 Overview of Study

In disambiguating ambiguity, this project has taken an iterative approach to investigation of what these terms mean, starting with engagement with the literature of KO (Chapter 2), then considering the terrain in which description takes place (Chapter 4), and finally asking how practitioner and infrastructure designer experiences reorient framings of ambiguity as

uncertainty. Through practitioner stories of the challenges of description, I can further address my research questions:

RQ1. Where does ambiguity arise in information systems?

RQ2. What factors lead to ambiguity in information systems?

RQ3. How might we gain insights around ambiguity in these systems to better serve participants?

6.2.1 REVIEW OF METHOD

For this study, I put out calls on social media inviting catalogers across CHIs to share their experiences dealing with ambiguity in their work. From these calls, 19 practitioners across a variety of sites signed up for 90-minute conversations via Zoom. Originally, I had imagined very loosely structured interviews in which practitioners would share their challenges. I quickly realized how challenging it can be to establish what different people in the field mean when using words like *representation*, *record*, or *resource*, so I decided to introduce the models I had created to facilitate our conversations. During the first half of each interview, I described my own research interests and introduced the chain of surrogation and taxonomy of ambiguity. After introducing each, I invited the practitioner to offer feedback on the models, asking questions, contesting definitions, or sharing alternative framings. These responses allowed me to consider the benefits and limitations of these models while introducing a shared vocabulary through which we could discuss their own challenges in their work. The second half of the interviews were open-ended invitations to continue sharing examples of friction and ambiguity.

While I had anticipated that interviewees would share detailed recollections of a few instances of ambiguity in their work, most instead offered longer narratives about the challenges of their work, highlighting the ongoing nature of encountering ambiguity. As a result of these roving conversations, the examples of ambiguity shared in this chapter were often discussed in passing without full accounting for their context or resolution. Nonetheless, the richness of the examples illustrates a range of ways that ambiguity is seen as a characteristic, an experience of uncertainty, or even an affordance of descriptive practice. These conversations yielded 253 examples of challenges faced by practitioners in the course of their representation work, as well as 144 examples of interventions made in relation to these challenges. To analyze this data, I listened to and read transcripts of interviews repeatedly, noting a variety of issues flagged by practitioners. I then coded the examples twice: once as examples of friction, then again as examples of ambiguity, in an effort to understand whether these framings led to the same conclusions about the challenges of this work. Analysis of these examples is at the core of this chapter's discussion, but it is informed by the

broader contents of these conversations, which provided context around the values and resources that inform representation.

Conversations with infrastructure designers were more loosely structured over the course of two or three interviews, which allowed me to better understand the issues they consider in their work. I sought to understand what tasks they did in their work, what upstream considerations constrained the design of the systems they developed, and how they thought about possible downstream effects of their work. In analyzing their responses, I considered what role ambiguity might have in their work or how the tools they design might shape experiences of ambiguity for the users of these tools.

6.2.2 REFLECTIVE PRACTITIONERS

Recognizing cataloging as a design field following Clarke (2018), I have asked how practitioners understand the strata of description as constraints that shape their work. Using the concept of the *reflective practitioner* employed by philosopher Donald Schön (1984) in discussing the work that designers do, I considered the ways that practitioners talk about the moves they make in noticing and addressing ambiguity in representation work. In viewing values, standards and management systems as constraints, I looked beyond the best practices or guidance offered in professional training to understand how catalogers think about their possible moves.

The infrastructure designers I interviewed also navigate many layers of constraints, though at different scales and with different priorities. Highlighting the differences between the ways that designers and catalogers discuss the constraints of their work provides greater contextualization of the constraints that infrastructures impose on descriptive practices. While the possibilities for intervention vary across institutional contexts, by collocating them in this chapter, I hope that we might see new possibilities for infrastructure design.

6.2.3 INSTITUTIONAL CONTEXTS OF PRACTITIONERS

The individuals I interviewed work in a variety of settings, which are explained in greater detail in Chapter 3. The majority work in an academic context, whether as library catalogers or archivists. Many do special collections cataloging or have specialized knowledge for departmental collections, such as music or law. Five of the catalogers interviewed work in museums; four of these catalog items in the collection, while one is a library cataloger for an art museum. Several of the participants work with digital collections; some are involved in the digitization process. One works with AV materials; one works with technology devices. One participant works as a corporate archivist. One is engaged for a project with an art museum on the description of the visual elements of a digitized codex. None of the participants work in a public library.

While the values and goals of their institutions vary, each of these practitioners has a clear sense of the users they are trying to serve and the variety of other stakeholders whose needs must be taken into consideration, from grant funders to colleagues. Their descriptions are created to facilitate access to items in the collection, with an eye toward interoperability and consistency across the collection.

The catalogers who work in libraries, regardless of departmental affiliation or specialty, tend to use similar tools. Regardless of the CMS they use, all engage with RDA, LCC, LCSH and MARC to create their descriptions, though many of them use supplemental tools and systems as well. Archivists tended to use a slightly more site-specific variety of tools for guiding their work, though the rules of DACS were regularly cited by each. Catalogers in museums had the greatest variety of tools and approaches to their work, with each using a different management system and CV, often developed on site. The corporate archivist had the least guidance from standards and tools and was doing their best to cobble together a set of standards that would fit their needs and be intelligible to future colleagues. The wide range of goals and tools used by these practitioners makes it impossible to compare any individual or groups of practitioners in a meaningful way but serves this project in highlighting the rich variety of challenges that are navigated.

The two system designers that I interviewed had very different roles and backgrounds. The first, who has worked on classification and CV systems, has also worked as a cataloger in academic libraries. Their reflections on the topic of ambiguity necessarily link to all of the roles that have played in the world of cataloging.

The second designer, who was building a tool for representing pronouns in an identity management system, has no cataloging experience and saw their work primarily as an information management issue. While this kind of design might seem out of scope of the world of cataloging, their understanding of how identity is a form of content that must be managed helped me to understand how technical designers conceive of the purpose and consequences of their work.

6.3 Ambiguity in the Field

Disambiguation in cataloging allows institutions to accurately inventory their collections and provides access to items. If ambiguity is seen primarily as the state of an item or record prior to disambiguation, we might see the consequence of its presence as inability to count and locate items in a collection. We can also find cases where ambiguity leads to misrepresentation in many forms, including totally false identification, and more subtle over- or under-specification within a group. Misrepresentation affects users in multiple ways, from rendering them unable to access an item, to leaving them confused about the contents of a category—or by suggesting certainty through reification of an identity that is not accurate. Pervasive misrepresentation in the catalog can also affect how an institution understands its collection. These consequences are not mutually exclusive,

of course, but naming them allows us to ask how ambiguity inhibits the functioning of the catalog and the institution—and perhaps to see when such consequences might be seen as an affordance to be strategically engaged.

In this section, I will share examples from practitioners of both friction and ambiguity and consider how these two terms point to similar and distinct phenomena.

6.3.1 SITES OF FRICTION

Friction experienced by catalogers can be seen as related to three major issues, which are not mutually exclusive. Data entry issues prevent a cataloger from describing an item in the way they believe best due to limitations in the infrastructures of representation. Conceptual friction occurs where the cataloger has ongoing questions about the identity or salient characteristics of an item and whether they can be adequately represented by the system. Finally, I describe as material those frictions that are related to the cataloger’s inability to understand an item due to its characteristics or context. For each type, I offer table with a number of different examples and discuss their implications below. The sets of examples included here are intended to answer the question: *What made it difficult to do the work of representation?* In these tables the reader will find items listed together that bear little resemblance to one another and might have very different resolutions. Nonetheless, these three broad categories of friction point to different approaches to intervention.

6.3.1.1 Data Entry

SITES OF FRICTION: DATA ENTRY	
Definition of data entry friction	Data entry friction occurs when a cataloger has a strong sense of what should be included in a description, but technical conditions make doing so difficult. On the chain of surrogation model, this friction can be described as being stuck between representation and description.
Data entry friction 1	Terminology
Terminology summary	It is impossible to enter the terms relevant to the item in the record due to issues with the classification or CV in use. Terms do not exist in the system, as concepts or as sub-concepts, or preferred terms do not facilitate easy access to item.
Terminology examples	<ul style="list-style-type: none"> • Lack of sub-genre specificity to represent religious poetry (L1) • Outdated preferred terms: <i>automation</i> to represent cloud services (L9) • Lack of object representation: musical kites [instruments] (L7) • Lack of concept representation: criminalization (L9) • Broken hierarchies: CV displays Mexico as sub-category of South America (M3)
Data entry friction 2	Transcription and transliteration
Transcription & transliteration summary	Encoding standards and romanization tables make it impossible to represent some non-English languages, even when scripts are already romanized on item.

SITES OF FRICTION: DATA ENTRY

Transcription & transliteration examples	<ul style="list-style-type: none"> • No place to put non-Latin scripts into transcription field in Sinopia linked data editor (L2) • Amharic romanization tables do not reflect common practice; cataloger cannot mirror author's transcription of name (L1) • Arabic romanization applied to Farsi materials misrepresents common use (L8)
Data entry friction 3	Name representation
Name representation summary	Western naming conventions are imposed on authors and creators. Different name orders or concepts of author identity are not easily represented.
Name representation examples	<ul style="list-style-type: none"> • Many Brazilian people go primarily by their first name, not their last name (L1) • Difficult to represent anonymous creators given names based on characteristics of their work, ex. "master of long fingers" (M4)
Data entry friction 4	Tool misfit to goal
Tool misfit summary	The goals of representation are not always served well by the tools used for description. These frictions can be noticed both in the process of using these tools for cataloging or be experienced by users as failures to access metadata (and thus items) that are present.
Tool misfit examples	<ul style="list-style-type: none"> • LCC does not have good concept coverage for law library (L9) • ArchivesSpace UI promotes more granular description than called for in DACS; no bird's eye view of finding aid (A1) • Catalog does not display all MARC fields entered by practitioner, fails to provide access to metadata (L1) • Provenance, critical metadata, is invisible in catalog because registrar records are not linked (M3)

Table 6.1 Data entry friction occurs when a practitioner knows how they would like to describe an item but is prevented from doing so by the infrastructures used for representation.

The infrastructures of representation, intended to facilitate consistent description of items across a collection, sometimes prevent a practitioner from entering metadata in a manner that will represent or facilitate access to the item. These frictions are experienced as data entry issues, whether caused by the CMS or the standards employed. This issue is most common in libraries and museums, where description usually requires highly structured entry of metadata into a set of predetermined fields. The high-level view and narrative form of archival description usually allows practitioners in those settings to find ways around many of these issues, though subject headings can present the same challenges as in other institutions.

The interface of a CMS consists of fields associated with distinct aspects of item representation. In most institutions, there are associated acquisition records; in libraries, item records are also linked to circulation data. Creation and editing of such records are usually determined by the role of the cataloger in the institution; some catalogers can edit accession records, for example,

while others cannot. While accession and circulation are not the concern of the cataloger, their records are embedded in these associative relationships that sometimes provide rationale for cataloger approaches to representation. For example, important information about provenance that is present in a museum accession record is not automatically exported or linked to the catalog record and is not viewable at all by end users. The invisibility of this important metadata requires that the cataloger add this information manually in notes—if they chose to do so at all.

The structure of the interfaces for entering item description is often guided by disciplinary standards such as RDA or DACS, though the CMS does not always facilitate full adherence to these standards. The possibilities of record entry in a CMS are also constrained by encoding standards such as MARC. The embeddedness of multiple standards within the software package can make it difficult at times to parse, whether friction is associated with a standard or with the management system.

Data entry challenges frustrate catalogers who know what should be done but cannot efficiently do so, and is often expressed as concern for how these technical issues inhibit user access to items. Many practitioners expressed frustration with CVs that offered inadequate coverage of concepts, even when the concepts seemed relatively simple. Whether one suggested a new term for a CV or made do with extra subject headings, the process of representation was less efficient than it ought to be. Occasionally catalogers decided to set items aside until conceptual coverage could be added to the CV. For some catalogers, these were chronic challenges, as their tools did not offer appropriate coverage of the subjects in the collection, requiring modification and explanations that might not be intuitive to users.

For practitioners working with non-English collections, translation, transcription and transliteration, as well as Western approaches to representing creator names, limit access to items by communities that would seek them. One library cataloger was acutely aware of the ways that poor transcription renders whole collections invisible through her own experience searching the catalog for items in her native language. She would search and find no results at all, then later find what she'd sought when wandering the stacks. Because transcription did not include the diacritics of the script, the catalog entries for these items were misrepresentations and invisible without direct engagement with the collection.

The ability of end users to make sense of records was a frequently invoked concern when it came to the technical limitations of data entry: What would they see? Would the fields be appropriately labeled? Would the fields employed even be visible?

While the disruptions to the cataloging process caused by data entry friction challenge many values related to access, they can also be seen as sources of inefficiency, where following the rules is impossible or pointless and is a waste of practitioner labor. While not all data entry frictions of this type are easily resolved, many could be minimized by updating standards according to local needs,

such as adoption of transliteration practices used by members of a language community or allowing more fields to display in user views of catalog records. However simple these solutions may seem, they often require technical implementation by companies or organizations outside of the institution.

6.3.1.2 Conceptual Friction

SITES OF FRICTION: CONCEPTUAL ISSUES	
Definition of conceptual friction	Conceptual friction describes cases where a practitioner is confident in their understanding of the item but cannot easily decide how to best represent it. On the chain of surrogation model, this friction can be described as the loop between identity and representation.
Conceptual friction 1	Genre
Genre summary	The practitioner understands the genre of the item but cannot decide how to best represent it.
Genre examples	<ul style="list-style-type: none"> • Vague meaning of <i>contemporary</i> in art museum with a century-old collection of contemporary art (M3) • Amorphous concept scope of the terms <i>newspaper</i> or <i>news story</i> in relation to student papers that are dominated by opinion and humor pieces (A1) • Representation and contextualization of self-published conspiracy theories in special collections (L6) • How to represent biographical content in an art book that does not meet the 10% threshold for representation? (L8) • Evolving technology terms: what is the spectrum from typewriter to word processor to computer? (M5)
Conceptual friction 2	Geography
Geography summary	Controlled vocabularies for geography assume certainty and stability of geographic and cultural boundaries, as well as clear relationships between places.
Geography examples	<ul style="list-style-type: none"> • Historical maps show borders that no longer exist or express a different version of a place name still in use; no way to say, “this is Tibet” (L4) • Part/whole relationships for broad geographic terms: is Arlington, WA part of Puget Sound? (M1) • Communities don’t neatly align with geographies, though they are often used as proxies for one another: what is Duwamish land? (M4)
Conceptual friction 3	Identity
Identity summary	Questions about the relationship between identity terms and the consequences of different approaches to representation highlight rhetorical and ethical conundrums.

SITES OF FRICTION: CONCEPTUAL ISSUES

Identity examples	<ul style="list-style-type: none"> • What is the significance of location as a demographic term for name authority records? Is everyone born in Chicago a Chicagoan? (S1) • What is the relationship between an original and a copy, or a copy of a copy in digitized archives? What characteristics transform identity? (A3) • Do racial terms used in current subject headings adequately represent older materials that used different terms? (L8, A3, A2) • Should authors or creators of zines, which were created in a community that values anonymity, be represented if they are known? (L6) • When an item from Afghanistan is classified as culturally Persian, what happens to Afghan identity representation in that item and across collections? How does it reify distinct understandings of Afghanistan and Persia? (L3) • Are artists files concerning the same artists equivalent across institutions when they contain different items? How to mark presence in OCLC while also signaling differences? (M5) • How can catalogers understand warrant for silence or omission in a record, for example re: spiritual or intellectual property considerations? (L5)
Conceptual friction 4	Salience
Salience summary	Characteristics of an item that are out of scope for standard representation strike the practitioner as particularly salient.
Salience examples	<ul style="list-style-type: none"> • Anomalous features. For example, in codex with many images of markets, one shows only women. (M2) • Absences, like anomalies, can be significant, as in an archives collection of mid-century Girl Scouts, both pre- and post-integration. When and how to mark exclusion or absences of racial groups? (A2) • Affective and aesthetic characteristics such as “beautiful” video in an AV collection (A3)

Table 6.2 Conceptual friction describes practitioner confusion at how to best understand or represent an identity using the given rules and tools.

Bibliographic classification theory meditates on the *aboutness* of items, offering guidance on subject analysis and building schemes for organizing information related to any imaginable topic. Classification asks us to imagine a world of mutually exclusive categories to which an item might be assigned, treating the item as a conceptually static entity that both is fixed by inclusion in a class and as an exemplary member of that class.

Deciding where and how to categorize an item is often less simple, requiring an often-quick turn between the cataloger’s sense of item identity and an assessment of available approaches to representation. When this process is not easily resolved, we can describe the friction as being related to conceptual issues, whether about boundaries between categories of identity or characteristic, or regarding the weight we assign to some characteristics over others. The hesitance in the practitioner

upon experiencing this kind of friction, expressed as confusion (“I’m not sure which term to use”) or concern (“What is reified or missed if I use this term?”), might signal different paths for resolution.

Unlike the many technical issues of data entry friction, conceptual friction has few easy resolutions. More precise definitions of genre terms, such as *contemporary* in the art museum setting, could aid catalogers in determining which items to include in a category, but new outliers will always push the boundaries of what might be considered conforming. Guidance might be feasible in relation to geographic issues, yet items that complicate the terminology of boundaries will always exist. Challenges related to human identity could be addressed through systematic ethical consideration and guidance around issues like privacy and anonymity of creators, though adoption of such might be seen as anathema to the projects of disambiguation or access. Similarly, questions about the politicized nature of some identity categories might be addressed through expansion of CVs to add richer approaches to representation, as in the case of questions about Afghan versus Persian identity. Yet much of this lies beyond the scope of the cataloger, and even that of many infrastructure designers. Under whose purview do these considerations fall?

While it is sometimes possible for practitioners to use notes and other fields to highlight characteristics of an item that might be otherwise overlooked, the importance of certain absences is difficult to operationalize. When is it important to signal that a group of people is surprisingly present or absent in an image? How can a cataloger describe such significance, much less interpret it? Deciding how to handle anomaly or invisibility may be out of the scope of systems of standardized representation.

Describing an item for which there is conceptual friction often requires compromise, where the cataloger may do their best to provide access while not believing that the identity of the item is accurately captured in the description.

6.3.1.3 Material Friction

SITES OF FRICTION: MATERIAL	
Definition of material friction	Material friction describes cases where a practitioner is unable to readily comprehend or describe the identity of an item due to characteristics or the context of the item.
Material friction I	Missing data or metadata
Missing data summary	The item or its metadata is compromised due to damage or separation from contextual and descriptive information.

SITES OF FRICTION: MATERIAL

Missing data examples	<ul style="list-style-type: none"> • Maps without dates or scales require a tremendous amount of extra research and expertise to describe (L7) • Original audience for AV item unknown, making it difficult to know which aspects of item are important to describe (A3) • Original selector of item in special collections is no longer at institution; no record is associated with item to highlight significance (L2) • Significant damage to AV items makes it difficult to discern their informational content even if playable (A3)
Material friction 2	Lack of resources
Lack of resources summary	The cataloger or the institution lacks the resources to efficiently understand or make sense of what is present.
Lack of resources examples	<ul style="list-style-type: none"> • Practitioner is hoping for a new CMS because current one is a poor match for the items in the collection, making description and retrieval very inefficient (C1) • Some damaged AV items are not playable; waiting for future technology to restore or safely play items to aid in their description (A3) • Internal institutional disagreement about the meaning of many terms in the CV (C1) • Translation challenges make it difficult to understand and thus represent materials in language not spoken by cataloger; history materials are especially challenging to understand and describe due to lack of expertise (L8)
Material friction 3	Misrepresentation
Misrepresentation summary	The item or its metadata make identity claims that are misleading or untrue.
Misrepresentation examples	<ul style="list-style-type: none"> • Forgery or appropriation in cultural collections (M4) • Book with contemporary eugenicist arguments listed as science by publisher; author authority record included claims of credentials not held (L2) • Vendor records automatically included in records often include marketing rather than subject descriptions (L9) • Donor misrepresentation of materials in anthropology collection, such as Swedish item in box labeled Central America (M4) • Original record for items in Olunyole are described as Swahili, a common problem in copy cataloging when catalogers have limited knowledge of languages (L1)
Material friction 4	Oddness
Oddness summary	Items that are odd or surprising, either in the context of the collection or relative to the tools for description.

SITES OF FRICTION: MATERIAL

Oddness examples	<ul style="list-style-type: none"> • Mixed-media abstract art items in special collections (L2) • Non-Lego brick model kit of real building, in box with pamphlet—a toy? A model? A kit? (L6) • Intentional fragments designed to be recombined (and frequently included as components of other items in collection) (C1) • Unexpected items in the collection, such as a handmade blanket that came with a word processor, used as a cover both for the machine and for the user’s lap (M5) • Items that change in monetary value and are no longer easily cared for in collection, as when an artist book in museum library collection moves into art collection (M5) • Items whose significance has to do with their change in use from original intent, such as a ketchup bottle used to store alcohol during Prohibition (M1) • Maps of nonexistent places, showing roads that no longer exist, lacking coordinates, no way to accurately assess location (L2) • Local (in-institution) TV station that only exists when it is on and in use (M5)
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Table 6.3 Material friction describes the experience a cataloger has when they cannot readily determine the identity due to characteristics or context of an item.

Material friction describes encounters with items that are challenging due to the absence of critical contextualizing information. When data or metadata is missing, the practitioner cannot understand how the item is supposed to be represented. Items described in libraries usually include bibliographic metadata that minimizes such experiences of total confusion, whereas archives and museums often have objects that are not attached to any descriptive matter.

However, even rich metadata can remain inaccessible to catalogers if they are unable to easily read the language or the script. While there are a variety of ways that such fluency limitations can be resolved, they point to a lack of resources, including expertise. In other institutional contexts, missing resources can include technologies that don’t exist in the institution—or in the world, such as tools for viewing damaged AV materials. Lack of resources was one of the most common sources of friction that inhibited representation. Usually, the lack was both vague and immense: they do not have the time (or budget) to spend on resolving frictions in an ideal fashion.

While misrepresentation was not a common source of friction, examples included books purporting to be science that reject scientific methods and consensus, and authors that misrepresent their credentials on their works and thus are misrepresented in authority records.

In museums and archives, issues with donor descriptions were cited as challenging to disentangle. The greatest challenge of misrepresentation across institutional contexts, however, was the presence of old records that are inaccurate. In some cases, catalogers are aware of portions of the collection that are rife with these issues and make efforts to update them when possible. In other cases, misrepresentation in the catalog is unknown and will remain so until someone notices and calls for a redescription. Because misrepresentation is usually indistinguishable from accurate

representation once a description is made, these records only surface when someone has the capacity to consider the legacy of moments in collection development and to operationalize what kind of misrepresentation had been encoded. However, some catalogers noted in passing that users searching OCLC might witness some of these tensions if they encounter multiple conflicting descriptions of an item but have little sense of which is most accurate (and on what basis accuracy is assessed).

Misrepresentation can also be more playful, as in the example shared of an art book that takes the form of a history of an imaginary world. The acquisition of this book, which had been assigned to this highly-specialized special collections cataloger, provided enough context to support its representation there. In other cases, catalogers end up with items that are more unexpected in their collection. In these cases, it might be simple enough to state what an item is materially and conceptually but difficult to decide how to represent it relative to the rest of the collection. Resolving most of these material frictions requires further research or expertise, both of which are costly.

6.3.2 DISCUSSION OF SITES OF FRICTION

The chain of surrogation model shows four links: item, identity, representation and description. The sites of friction shared by catalogers roughly map to this chain, with data entry friction associated with the link between representation and description, conceptual friction located in the link between representation and identity, and material friction associated with the item itself, either in relation to identity or in relation to the collection. As seen in the discussion above, frictions are not evenly present across institutional contexts. The precise and highly structured form of bibliographic description in libraries leads to frustrations when the infrastructures don't work well for representing an item, so data entry friction, common for library catalogers, was experienced as a more limited frustration with CVs by those working in museums and archives. Conceptual description, on the other hand, was present across CHIs. This form of friction relates both to issues with language and concept boundary issues, where the parameters of membership are unclear, and to ethical issues where the consequences of representation complicate the description process. Finally, material friction is, like conceptual friction, found across settings and usually requires time and expertise to sort out.

While these categories of friction suggest different interventions, practitioners most often talked about these challenges in relation to labor, not having enough time or help to manage all the frictions they encounter. The focus in these examples is primarily on the experience of doing representation work, yet many catalogers thought about friction as an end-user experience that they anticipated and tried to avoid—but were deeply aware was inevitable.

Colleagues were discussed in relation to friction. For those doing original cataloging in libraries, attention to detail was not only an act of representation but a kind of service to fellow

catalogers who might rely on these records for copy cataloging. In challenging cases especially, including some form of rationale for one’s approach to disambiguation was a recognition of the difficulty of this labor, a good deed for other practitioners who would appreciate what periodicals cataloger, L4, referred to as a “trail of breadcrumbs.” Description was seen not only as process of disambiguation but of easing future friction.

6.3.3 AMBIGUITIES OBSERVED

For the most part, the examples shared by practitioners could be viewed both as examples of friction and ambiguity, as seen in some examples below. The subtypes of ambiguity I introduced resonated with practitioners, who often shared examples in response to the taxonomy, exploring with me through conversation to see whether the boundaries of the categories of ambiguity might fit their own challenges. In the tables below, I provide examples of simultaneity, uncertainty, strategy and residuality across library, museum, archives and corporate contexts in tables below. Relationships between these terms, and their potential use and limits, are discussed subsequently.

6.3.3.1 Simultaneity

AMBIGUITY TYPE: SIMULTANEITY	
Simultaneity description	Perhaps the simplest form of ambiguity, simultaneity describes items with identities that are complex or immense in a way that the system has a difficult time representing. Simultaneity challenges the values of efficiency and parsimony in cataloging, as well as complicating intelligibility for users.
Institution type 1	Library
Library simultaneity summary	Interdisciplinary and genre-defiant items are common in libraries. Creator identities can also have these characteristics, leading to challenges with authority control. Representing these items challenges efficiency, parsimony and intelligibility.
Library simultaneity examples	<ul style="list-style-type: none"> • Multi-lingual works, such as poetry written in multiple languages (L1) • With media and form translations, such as a map on a CD-ROM, it can be difficult to decide how to attribute primary identity to make it most accessible to users (L4) • In recordings of musical performances, how to decide the number of relevant creators and provide intelligible access to the item through their representation? (L7) • How to describe biographical content in an art book that does not meet the 10% threshold for representation? (L8)
Institution type 2	Museum
Museum simultaneity summary	Embedded material or conceptual characteristics present in items can be difficult to provide access to through description in museums, especially when materials are stored relative to a primary identity.

AMBIGUITY TYPE: SIMULTANEITY

Museum simultaneity examples	<ul style="list-style-type: none"> • Artist books in a museum are often accessioned as library items but may move to art collections if they come to be understood as significant or valuable in a new way, preventing collocation of similar items in institution (M5) • Significant characteristics can be found in items across categories and remain invisible in the catalog. For example, a visitor seeking items with tassels could not be easily helped though there were abundant relevant items in the collection (M4) • Ship of Theseus issues: As items get repaired and parts are replaced, is there a point at which the identity changes and the item should be described differently? (M6) • Multiplicity of meanings in a Nahuatl word: how to translate consistently across catalog? (M2) • Archaeological level bags share provenience but consist of mixed material with no significant synthesized identity; partial contents of bag may be separately identified over time (M1) • Single-purpose handheld game embeds software in hardware; neither has useful identity without the other (M6)
Institution type 3	Archive
Archive simultaneity summary	Examples of simultaneity in archives have similarities to both libraries and museums. Items can have material or conceptual identity that is difficult to efficiently represent. CVs can flatten the complexity of meaning around identities in historical contexts.
Archive simultaneity examples	<ul style="list-style-type: none"> • Items in AV collections may have damage or errors while still being accessible; both the error and the original content are significant to some audiences (A3) • Newspapers with many different kinds of articles can be challenging to represent (A1) • CV for racial terms suggests contemporary views that fail to represent the social contexts of historical materials, such as “Negro Girl Scout” troops in mid-century collection (A2)
Institution type 4	Corporation
Corporation simultaneity summary	An item can be found throughout the collection, embedded in different ways in other items. It is not always clear if or how it functions differently across these aggregate items.
Corporation simultaneity examples	<ul style="list-style-type: none"> • Most of the material in this collection is developed by the corporation in service of their professional development programs. Modules are haphazardly reused, sometimes modified (C1)

Table 6.4 Simultaneity describes things that are difficult to render in the catalog due to their complex and multiple identities.

In the taxonomy of ambiguity, I used simultaneity to describe items that include multiple identities that are important or primary, but which are difficult to represent due to the tendency of catalog description to value parsimony and hierarchy in representation of identities and characteristics. The practitioner may have a good sense of the many aspects they would like to describe, or they may be overwhelmed by the complexity to the extent that it remains largely unknown. The examples shared by practitioners ranged from anthologies that blend distinct genres, to monographs of interdisciplinary research. They also extended to consideration of the relationship

between parts and wholes. As one institution slowly replaced components of items, catalogers had to consider how these identities were related and whether a sufficient number of replaced parts might change the identity of the whole—the ship of Theseus paradox in the form of electronic devices. A cataloger of archaeological material offered a very different example of simultaneity in the form of a bag of mixed materials that had been dug from the same square of earth. Unlike the paradoxical electronics, the contents of these level bags contribute little to the identity of the bag, though they might be described if they are known. For these items, the spatial origin of heterogeneous materials is a proxy for its temporal identity, which might in turn aid in further identification of the bits therein. While the conventions for representing these items adequately disambiguates the bags from one another, their contents remain ambiguous and inaccessible to most catalog users.

Simultaneity can also point to the presence of conceptual complexity, such as the relationship between an item and its damage, where both may be relevant to some users, or to the inability of the practitioner to parse what is present—common in archives where the range of materials may not make sense. The limits of language, too, are highlighted by the sometimes-sticky relationships between old and new terms, which may both be true but have very different valences. Several catalogers shared examples of their hesitation in applying contemporary identity terms to items that use older language to identify marginalized communities. Would the terms provide the same coverage, or highlight the contexts of the communities represented in or by these items? In a corporate setting where items are frequently reused and remixed, the presence and relevance of duplicates across the collection might be worth accounting for, though the cataloger was seldom able to determine what was most salient.

While simultaneity as a concept allows us to point to a challenge faced by catalogers in representing identity, the variety of forms it can take have little in common. While it is irritating to have to describe a complex item simply, many practitioners find ways around the limitations of structured description by defying best practices that urge parsimony, adding extra subject headings, narrative notes, or multiple classifications as means of signaling richness of content and subject. These records, however, may not be easily legible, especially if the relationships between the additional terms is not clear. Several catalogers noted that most items seem deeply simultaneous if you think about them for very long, yet only a handful of items presented dilemmas for representation. The cases that troubled practitioners were those for which a lack of rich representation would seem to be a misrepresentation—yet the limited means of structuring rich description could lead to misrepresentation of another kind.

6.3.3.2 Uncertainty

AMBIGUITY TYPE: UNCERTAINTY	
Uncertainty definition	In cataloging and classification literature, ambiguity is generally treated as a kind of resolvable uncertainty or the result of underdescription. Uncertainty can be related to the identification of items, the interpretation of representation rules, or to lack of clarity in a record. Across all institutional contexts, uncertainty can limit access through misrepresentation of items.
Institution type 1	Library
Library uncertainty summary	A cataloger does not have the full ability to describe due to limited knowledge of or ability to interpret items, or due to unclear guidance in use of standards and other tools of representation.
Library uncertainty examples	<ul style="list-style-type: none"> • Misuse of term in title: in music, sometimes a piece is labeled as a form that it is not. For example, a recording labeled a flute <i>mass</i> which is not formally a mass (L7) • Illegibility of scripts, a common issue for catalogers who work with items published in languages they do not read or speak (L1) • Translation challenges make it difficult to understand and thus represent materials in language not spoken by cataloger; history materials are especially challenging to understand and describe due to lack of expertise (L8) • Underspecified records are sometimes created to provide minimal access despite uncertainty regarding item to be accessible by individuals who already know of the item's existence (L2) • Inaccessible subject headings, ex. users might not know that LGBTQ subjects could be found under heading <i>sexual minorities</i> (L9)
Institution type 2	Museum
Museum uncertainty summary	Uncertainty in museums often concerns the cataloger's understanding of the importance of particular characteristics of items and their ability to discern and represent them.
Museum uncertainty examples	<ul style="list-style-type: none"> • Part/whole relationships for broad geographic terms: is Arlington, WA part of Puget Sound? (M1) • Unknown age or dates: in living cultures collection, many items have no attributed dates, making it difficult to represent them contextually (M4) • When is an item's importance not based on its own identity, but as metadata? For example, items collected by an artist may not have value in the art collection as objects on their own but allow researchers to contextualize their collector (M5) • Are artists files concerning the same artists equivalent across institutions when they contain different items? How to mark presence in OCLC while also marking differences? (M5)
Institution Type 3	Archive
Archive uncertainty summary	In part because they describe collections rather than individual items, cataloger examples of uncertainty in archives tend to emphasize challenges for users in interpreting and accessing what is present.

AMBIGUITY TYPE: UNCERTAINTY

Archive uncertainty examples	<ul style="list-style-type: none"> • Unclear genre: in newspaper collection, cataloger was not sure how much was satire (A1) • ArchivesSpace UI promotes more granular description than called for in DACS; no bird's eye view of finding aid (A1) • In AV archives, sometimes the cataloger has a sense, but no evidence, that information is missing (for example a missing tape), the absences of which may make the collection as a whole less legible (A3)
Institution Type 4	Corporation
Corporation uncertainty summary	Uncertainty in the context of this corporation centered on the gap in understanding between the cataloger and the users of the system.
Corporation uncertainty examples	<ul style="list-style-type: none"> • No clear relationship between parts and wholes (C1) • Lack of clear institutional ontology, with disagreement among internal groups about the goals of the collection (C1)

Table 6.5 Uncertainty describes experiences of hesitation due to inadequate information to identify an item or to describe it using available rules and tools.

It seemed possible, when I began conversations with practitioners, that all examples of friction or ambiguity would fall under the category of uncertainty, the detritus of failed disambiguation. Alternatively, it seemed possible that uncertainty would prove to be too vague a concept to hold any contents. Instead, I found that practitioners used the language of uncertainty to point to experiences of acute confusion in describing an item, or for users in encountering a record. Unlike examples of simultaneity, uncertainty contained no sense of ideal representation, nor a clear sense of a workaround.

In some cases, the uncertainty was associated with an ethical challenge, especially in regard to accessible representations of items in libraries for use by marginalized communities. In other settings, uncertainty was more often associated with a puzzling lack of information on the item, or awareness of the uncertainty that a record might produce in a user. Uncertainty for users was not ascribed only to a lack of metadata, but to an excess of it. One library cataloger (L7) described her process as being willing to “put everything but the kitchen sink” in a record, but only if she thought it would help a user find something they would be “glad” to find through those terms. If the granularity of a description over represented the presence of some characteristic of an item, a new kind of uncertainty would be introduced. This concern with evaluation of records was shared by other practitioners, who considered not only whether a user would experience confusion or uncertainty about the item described, but whether they might distrust the catalog (or the cataloger) if they had too many experiences of uncertainty. Equally troubling to several catalogers was the possibility that a record would *not* appear to be uncertain to users, that it would instead be merely

invisible or taken at face value. The reification of description might suggest certainty where the practitioner experienced doubt.

Uncertainty challenges the cataloging values of accuracy and access, the cost of which is often more practitioner labor for research or contextualization. The wide range of sources of uncertainty do not suggest any easy way of marking the contextual. Still, we might wonder whether some forms of supplementary metadata could help users and future practitioners make sense of records and items that provoke uncertainty.

6.3.3.3 Residuality

AMBIGUITY TYPE: RESIDUALITY	
Residuality summary	Borrowing from Star and Bowker (2007), the term residuality is used to point to identities that are not readily represented in the catalog, often due to changes in identity over time, place or another context. It can also be used to hold the leftovers or miscellany that do not fit the category system in use. Residuality challenges the values of accuracy and consistency in cataloging and can be seen as reifying identities as not-belonging.
Institution type 1	Library
Library residuality summary	In the library, items or collections that are not well represented by classification systems or subject headings, or challenges reflecting item-proclaimed identity due to descriptive standards or the CMS, can be described as residual.
Library residuality examples	<ul style="list-style-type: none"> • Many Brazilian people go primarily by their first name, not their last name (L1) • LCC poorly describes items from non-US cultures; description of cultural subject matter from the Middle East is forced to use terms related to international relations (L3) • Serials are by nature incomplete, their identity changing over time in a way that makes their representation technically challenging (L4) • Describing items in a law library using LCC does not allow for the representation of actors, an important characteristic for materials that consider perpetrators of crimes (L9)
Institution type 2	Museum
Museum residuality summary	In museum settings, changes in identity or status of items over time, both as historical objects and as members of a collection, can lead to inconsistent or confusing descriptions, challenging understanding of items and of the collection.

AMBIGUITY TYPE: RESIDUALITY

Museum residuality examples	<ul style="list-style-type: none"> • The cultural significance of items can shift over time, ex. a tin can could hold ceremonial significance that a century before would be identified with a different kind of vessel; expertise is required to determine salience (M4) • Local (in-institution) TV station that only exists when it is on and in use (M5) • Inherited arbitrary hierarchies from merged collections complicate the representation of new items; not using these hierarchies either makes the catalog more difficult to navigate by failing to collocate like items (M3) • Characteristics germane to the collection, such as affect, are not easily marked; how to find art pieces about loneliness, for example? (M3) • As communities change their preferred names, such as Nez Perce to Nimiipuu, older records may retain incorrect information (M4)
Institution type 3	Archive
Archive residuality summary	In archives, the heterogeneous nature of collections can make it difficult, especially for users, to interpret the range of items and the identities of their collocated forms, challenging values of intelligibility and access.
Archive residuality examples	<ul style="list-style-type: none"> • As accessions are added to collections, the identity of the collection can shift; descriptions that previously suggested certainty about the nature of the content are no longer as representative (A1) • What is the relationship between an original and a copy, or a copy of a copy in digitized archives? What characteristics transform identity? (A3) • Absences, like anomalies, can be significant, as in an archives collection of mid-century Girl Scouts, both pre- and post-integration. When and how to mark exclusion or absences of racial groups? (A2)
Institution type 4	Corporation
Corporation residuality summary	In a corporate setting where many participants can add materials to the collection, residuality can be seen as the legacy of inadequate strategies for knowledge organization. This challenges values of consistency, accuracy and access.
Corporation residuality examples	<ul style="list-style-type: none"> • Similar terms used by different groups of people to signal different things lead to inaccurate collocations (C1)

Table 6.6 Residuality, the byproduct of any system, can be used to describe things that are intentionally or circumstantially excluded from accurate representation in the system.

Residuality as a form of ambiguity is a product of surrogation, a transformation of identities into representations that are somehow askew. Most practitioner examples focused on the user experience of making sense of the catalog, though several shared moments of being forced to render items into these misfit forms. I had imagined that residuality would capture instances where a fluid identity was artificially fixed due to the snapshot nature of record, as seen in the case of describing serials (L4). I also understood the potential of this term to highlight cases where the logic of the

system failed to support representation of specific collections, as when trying to use LCC to classify materials in a law library (L9).

Outside of the library, however, residuality seemed to point to the pervasive challenges of fixing identity in general. Rather than pointing to the limits of the record or the standards employed, practitioners asked questions about the nature of observation, asking how to point to absences or affect, or how to think about the relationship between originals and copies. The challenges of expressing these characteristics in a structured description were certainly systemic, but it wasn't always clear that they would be easily resolved in a non-cataloging context. Residuality of this sort was not produced by the infrastructures of description as much as the cognitive task of determining salience.

The peculiarity of residual ambiguity is that it is woven evenly throughout the catalog, even if some items are particularly affected by it. It is the negative space around the standards and infrastructures that support description. Residuality quietly reifies and misrepresents exactly as a system has designed: it is a feature of any system that requires conformity with a point of view to be included in the collection. Because it is often compliant with standards and the goals of description, viewing residuality as a kind of misrepresentation does little to resolve it at the record level. As a perpetual effect of any description system, it challenges legibility and may cause downstream issues in interoperability of records in a manner that can be stubbornly invisible. Therefore, we must notice which categories of items or characteristics remain most difficult to represent in our systems and move toward approaches that better integrate them, or at least mark their limitations.

6.3.3.4 Strategy

AMBIGUITY TYPE: STRATEGY	
Strategy definition	Strategy describes intentional partial representation, or misrepresentation, to protect privacy or to allow an item to be understood in a particular way. In the chain of surrogation model, strategy is associated with description or the item itself.
Institution type I	Library
Library strategy summary	Strategy in library cataloging is usually discussed in terms of choices made in records, though occasionally it points to approaches to self-representation of items or to the inability of the cataloger to make sense of the item.

AMBIGUITY TYPE: STRATEGY

Library strategy examples	<ul style="list-style-type: none"> • Conceptual art book that follows genre conventions of nonfiction; title describes it as a volume in a history of a place that does not exist; there are no other volumes in the series (L6) • Author anonymity: many zines are created by authors who do not wish to be identified outside of their communities (L6) • Omission of authority data: some authors request that some demographic information, such as birth year, be left out of their name authority records (L4) • Form defiance: sheet music with musical notation that takes unconventional form (shapes, narratives, etc) (L7) • Omission of metadata: in digitized collection of politically charged historical documents, some names are intentionally left out of the description to minimize risk of harm to living individuals (L5) • Book with contemporary eugenicist arguments listed as science by publisher; author authority record included claims of credentials not held (L2) • Dark archives: materials that are not supposed to be publicly available will be stored and described in a secure manner that does not provide any legible identifying or contextualizing metadata, titled with alphanumeric strings (L5) • Exoticism: colonial legacy of catalog emphasized the exoticism of a collection by underrepresenting items as though they were unknowable, thus making them inaccessible for real users (L1)
Institution type 2	Museum
Museum strategy summary	As in libraries, strategy can be seen both in practitioner encounters with items and with their approaches to description, affecting how both items and collections are understood.
Museum strategy examples	<ul style="list-style-type: none"> • Legacy of colonial worldviews: until recently, art and anthropology collections were considered mutually exclusive; Indigenous art went into anthropology collections, so current art collection has only more recent works by Indigenous artists (M3) • Characteristic defiance; in codex, minerals have agency; no readily used language can express this identity (M2) • Intentional underdescription to protect community authority over items. In anthropology museum, some items are stored separately from items with similar appearance and are only minimally described for inventory and retrieval purposes, not shared in public catalog (M1) • Creator non-identification with identity terms. For example, creator of photos held in collection does not identify as a photographer and is not represented as such in name authority file (M3)
Institution type 3	Archive
Archive strategy summary	In archives, strategy is associated with the provision or denial of access to items or their relevant identities. Compliance with legal and ethical guidance motivates approaches.
Archive strategy examples	<ul style="list-style-type: none"> • Omission (or retraction) of personal names from finding aid for collection documenting assistance for victims of domestic violence (A2) • Representation of women by married name in relation to collections they donated. For example, “Mrs. Joshua Newton” may not be known by her first or unmarried name (A2) • Underdescription of materials in state archive related to murder case, which included photos of victims; this opacity was not in compliance with sunshine laws (A1)

AMBIGUITY TYPE: STRATEGY

Institution type 4	Corporation
Corporation strategy summary	No examples of strategy in corporate context were shared

Table 6.7 Strategy describes identities that actively defy the rules of the system; alternatively, it can point to interventions in description taken on behalf of an item or its creator.

When I first sketched out my taxonomy of ambiguity, I thought of strategy as a preemptive resistance to the logic of a representation system, a means of circumventing residuality as a byproduct of the system. I imagined strategy as a chosen identity that might not fully align with the actual contours of an item, a means of advocating for collocation with a set that would confer some protection or benefit. As practitioners shared examples of their work, however, my understanding of ambiguity as strategy expanded to include a wider range of forms of resistant representation. This category includes zines by anonymous authors, eugenicist rants masquerading as science, and charming art books purporting to be histories of imaginary places. These examples shared many characteristics with uncertainty in that a practitioner might be unsure of what is present, but the uncertainty was provoked by a disconnect between what the item claimed to be and what the practitioner sensed it was.

Most examples of ambiguity as strategy, however, were choices made by a practitioner to create a description that was not a fully accurate representation. In some cases, especially in older records, this could include choices made by practitioners whose descriptions cemented their status in terms different than the creators would have used. One library cataloger noted that collections from some parts of the world were acquired in the course of missionary projects and were treated as permanently exotic and inscrutable (L1). Ambiguity conferred through description can also protect either the item or communities associated in some way with the item. A record or catalog in which ambiguity has been strategically deployed might provoke a sense of confusion in a user, but it is likely that it will be invisible to users, at least until they access an item and notice discrepancies between their perception and the description.

These two distinct forms of strategy as related to self-representation of items or as approaches to description by practitioners might lead us to ask different questions. First: how do we notice and interrogate self-misrepresentation to decide whether a description should correct or clarify identity statements? Second: When and how should practitioners consider deploying ambiguity as a strategy for advocating for an item or those connected to it? While some forms of metadata omission are called for via privacy policies, as in the case of the archival materials listing recipients of aid by name, the priority of access leaves practitioners with little guidance on when and how to defy best practices.

6.3.3.5 Miscellaneous Ambiguities

Of the 253 challenges shared by practitioners, I could not justify placing 38 of them in any of these categories, mostly because they highlighted ongoing issues related to understanding the relationship between items and their identities. Most of these, however, were easily sorted as forms of friction.

6.3.4 DISCUSSION OF AMBIGUITY TYPES

The treatment of ambiguity as resolvable suggests that it is an experience moved through, not an impenetrable characteristic of an item. My interest in the possibility of constitutive ambiguity located resistance to sorting in the item, if not as primary identity, then as a central salient characteristic. I have evaluated these challenges as types of ambiguity according to my taxonomy in order to assess the holding power of these categories. In developing this taxonomy of ambiguity, I imagined that simultaneity and uncertainty could be related to ambiguity as experience, a kind of discomfort or confusion that one would move through on the way to a sense of certainty about identity (even if it remained difficult to represent in the infrastructures at hand). Residuality and strategy seemed to point to possibilities of inherent ambiguity, or at least ambiguities rendered by the system that created misrepresentations. Resolving simultaneity and uncertainty seemed to be a technical project, feasible if inefficient, while addressing strategy and residuality would require a kind of care and attention to the ethics of representation, which might not resolve as disambiguation at all.

As I sorted examples of ambiguity into these subcategories, my perception of their commonalities and resolutions shifted somewhat. While simultaneity still seems the most technically and conceptually easy to resolve, many examples of residuality might also be solved through changes to standards, allowing, for example, for non-Western naming conventions. Uncertainty and strategy had more in common than I'd first imagined, pointing both to resource limitations that prevent practitioners from fully understanding or representing items, and to characteristics inherent in some items that defy efficient description.

Practitioners suggested that ambiguity inhibits access to items either by leaving users confused about how to interpret a description, or by treating an incorrect identity as certain, which renders an item invisible through misrepresentation. Who and when these issues might be noticed as ambiguous is not entirely clear. It seems likely that only very partial or contradictory records will strike a user as ambiguous. Additionally, just as one can exclaim that everything is relative, one could point to infinite ambiguities potentially present in even the most precise seeming description. Because this taxonomy points to ambiguities that are experienced or noticed differently by

catalogers and end users, it is not easy to use as tool for decoding the myriad issues with representation that it points to. Nonetheless, it was helpful for many practitioners to think through the challenges of their work from multiple perspectives. The indeterminate point of view of this taxonomy allowed them to reflect on a wide range of challenges they face and concerns they have regarding the work that their representations do, both in facilitating access to items and contributing to our understanding of the world through the creation of records that make authoritative claims about identity and relationships between things.

On the whole, practitioners I spoke with acknowledged ambiguity as a challenge in their work but mostly did not describe it as a perpetual barrier or inherent characteristic of items. I had expected, due to the pragmatic nature of cataloging, to encounter resistance to the idea of ambiguity as either perpetual or inherent. Instead I heard a much simpler explanation from many participants for dismissing this view of intractable struggle. Ambiguity was not eliminated by following rules to assign a precise identity to a random item; the item had already been added to the collection. The initial disambiguation had been resolved prior to their receipt. It already belonged. Because very few encounters with items began with an experience of total confusion, there was not a sense of ambiguity as a salient characteristic to be preserved. Unlike my understanding of constitutive ambiguity as a liberatory aspect of identity, several practitioners saw ambiguity as an affordance they could confer through description. The language of liberation was not used when discussing strategies for ambiguating records, but related terms like *protection* and *justice* were. These examples will be discussed further in relation to interventions.

6.3.5 DISCUSSION OF CHALLENGES IN DESCRIPTION

By inviting practitioners to share examples of both ambiguity and friction in their work, I hoped to both elicit a wide range of examples of the variations of ambiguity that I had identified and to expand my sense of what it might mean to talk about ambiguity in the cataloging context. As discussed in the summaries above, each approach yielded somewhat different examples, with many overlapping. While it could be possible to map these two approaches to one another, they are collocated in aspects of representation more than synonymous. While inquiring about friction did stimulate conversations about ambiguity, it also provoked consideration of myriad other challenges in the work, particularly failures of infrastructures and institutions to provide adequate resources for supporting the technical and cognitive labor of determining identity and creating appropriate representations of collections. For all of the examples shared, there was a clear limit to the extent that any cataloger could dwell on the nuances of describing an item, because every person I talked to faced a backlog of items that needed cataloging. Thus, institutionally speaking, the total invisibility and lack of access to collections that remained unknown to everyone but the registrar constituted a massive latent ambiguity in the collection. Automated cataloging and copy cataloging, often

proposed as solutions to this problem, save time but bypass the skilled labor required to make sense of challenging materials, potentially trading efficiency for accurate or just descriptions.

Both the taxonomy and the chain of surrogation model prompted examples of a wide range of issues that can be described as technical, ethical and resource challenges. Across these issues there are cases where disambiguation is plausible or implausible. In the following section, I will discuss the range of approaches to these challenges taken by practitioners.

6.4 Interventions

Interventions can address ambiguity or friction. These are not necessarily mutually exclusive. Practitioners I interviewed took a range of approaches, from impromptu redesign of CVs or local deployment of new policies to handle ethical challenges, to more constrained responses using existing tools to provide more expansive and expressive metadata.

6.4.1 TECHNICAL INTERVENTIONS

Technical interventions are changes made in the apparatus of representation, whether through the modification or introduction of new standards and systems. In some cases, practitioners can directly change or build new tools, while in others they advocate for changes to existing ones. Technical interventions advocate for systems to function and for the increased access, accuracy, and efficiency of the catalog.

Development of local controlled vocabularies organizes collections or supplement existing schemes (M1-6, L6). In several examples, they also served as a means for facilitating ongoing conversations with peers in the institution about what aspects of the collection were important to highlight. These tools can bring greater depth and accuracy to representation of collections than schemes like LCSH, as well as juxtapose and combine categories that it might treat as mutually exclusive.

Modification of classification schemes to fit local use in a specialized library is usually done through use of a limited set of classes (L3, L9, M5). While abbreviated schemes made more sense than including classes that users would not expect to find in the collection, it can lead to some peculiar placements, as when mathematics textbooks in Arabic are shelved as literature (L3).

Proposal of terms to LC was undertaken by many practitioners as a means of providing conceptual coverage for an item which would be difficult to represent otherwise. These proposals could be very practical, as when a proposal was made to add musical kites as instruments (L7), or to create a heading for constellations of satellites (L9).

Adoption or modification of CMS to fit local needs is not easily undertaken by most practitioners whose institutions use enterprise software solutions that are purchased by administrators. One archivist, however, kept a running list of issues with the design of ArchivesSpace, which they shared with the company in hopes that changes would be present in the next update (A1). The entire CMS and CV of one museum was redesigned by the practitioner I spoke with—a task that was possible due to the smaller scale and limited history of the institution (M6). The metadata specialist working for a museum on the description of a digitized 16th century codex was in the unusual position of working with a team of developers who would help implement the entire project. While not quite a CMS, this system was modified as needed based on the feedback from the practitioner about the technical challenges of representing this item (M2). Finally, the cataloger in a corporate context was working with a CMS that was woefully misaligned to the collection, adding an additional layer of difficulty to the task of describing confusing items. Securing a new CMS was a priority for this practitioner, who spent considerable time comparing products (C1).

Design and use of crosswalks to aid in representing across systems was important to practitioners who create multiple descriptions of an item, such as the local catalog and Wikidata. One took on the task of developing a crosswalk to use with the systems most commonly used in their department (L2).

Addition of notes or use of wider range of fields to contextualize items or highlight salient characteristics not easily represented through classification and CVs was the most common approach across sites in dealing with the limitations of existing systems. The strategies taken by catalogers sometimes defied best practices—or user interpretability. For example, representing complex or compound subjects was handled by classifying an item in two or more places or adding extra subject headings, even if there was no easy way to represent the relationships between them. Notes fields were often used to add additional contextual information or even to express a degree of uncertainty in the description. MARC fields were sometimes used to add metadata that might not show up in the catalog record due to the design of the user interface. While many practitioners expressed frustration that the end user still might not be able to make sense of the record, if nothing else, it allowed them to document for colleagues how they had made sense of an item.

6.4.2 ETHICAL INTERVENTIONS

Ethical interventions and advocacy take a wide range of forms but involve careful engagement with both the items needing description and the goals and values of the collection and institution. In some cases direct action can be taken through approaches to description, which may include non-compliance with standards, while others require advocacy outside of the catalog for resolution. These interventions advocate for undoing harm, protecting those associated with items,

and shifting what is reified in the catalog. Their successful implementation addresses justice, stewardship, and accessibility of items and collections.

Development of controlled vocabulary to support just and accurate representation of communities and their cultural items allows institutions to provide nuanced description of items and to attend to legacies of exploitation present in many collections. Doing so requires a level of subject expertise or collaboration with relevant communities. Examples include a CV for Coast Salish materials in a museum (M1) and a multi-lingual CV for describing a 16th-century codex that includes multiple epistemologies (M2).

Proposal of terms to LC, while often a technical intervention, can also be an ethical one, as seen in the example of proposal to add the term *white people* to provide more balanced demographic representation (L2).

Strategic description through selection of subject headings and contextual notes is often used to provide a more robust or accurate representation of items. One approach was use of multiple terms to describe an item, including Indigenous terms from the region of origin to provide access to that community (M1). Additional subject headings can also highlight controversies related to an item, such as adding terms *white supremacy* and *popular works in sociobiology* to a book with eugenicist themes (L2).

Underdescription or omission of metadata was used to by several catalogers to provide privacy to creators or communities associated with an item (M1, L4, L5). This approach can also be deployed to protect the geographic origins of items, as when the provenance is not included in the record for archaeological items to prevent unauthorized digging at the site (M1).

Content warnings are used in catalogs and records to highlight problematic material or to contextualize the legacy of the collection. These warnings may come with invitation to users to give feedback if they find records with incorrect or offensive content (A1, A2, L3, M3).

Moving and redescribing items allows practitioners to **challenge the self-representation of an item**. For example, a book on eugenics published as science was moved to philosophy; the OCLC record was also updated to decrease the chance of copy cataloging perpetuation of misrepresentation of subject (L2).

Moving and redescribing items to provide just access is a strategy taken by practitioners to undo previous misrepresentation. For example, a collection of African-language materials previously underdescribed and treated for decades as exotic and rare was recataloged and moved to provide access to local community (L1).

Strategic inclusion of items in a category or class is a means to advocate for expansive representation. Attention to the reifying quality of records has inspired some practitioners to reinterpret the traditional boundaries of a category. For example, a cataloger in an art museum chose

to describe a woman artist as a member of a group of regional artists that has historically only included men (M3). The cataloger in an art museum library cataloged a book with photographs by a Latinx artist under the photographer's name to increase their visibility in the collection, though they were not a primary contributor to the book (M5).

6.4.3 RESOURCE INTERVENTIONS

While technical and ethical challenges can be addressed through engagement with record creation and management, some sites of friction or sources of ambiguity are related to lack of resources in an institution—especially time, labor and expertise. Descriptive records rarely advocate directly for these resource needs, so practitioners often work outside of the context of the catalog to draw attention to these needs.

Advocacy for attention on behalf of an item is central to the project of description. Choices to highlight unusual characteristics, such as affect or cultural significance, shift not only how users find items but how an institution is understood through its catalog. Several practitioners mentioned their acute awareness of how their work could be used to advocate for the collection within the institution, both as a guide for acquisitions development and as evidence that might aid in funding efforts (A3, M4, M6).

Advocacy for tools and expertise in determining identity to aid description is not readily done through the descriptive process, though occasionally notes indicate tools used, such as chemical analysis (M1). Notes might also highlight absence of a tool needed for description, such as AV equipment that can play damaged items (A3). While advocating for equipment or instrumental analysis is important in some settings, more often the missing tools= is the knowledge and insight of another person. Lack of expertise in language or subject area is a barrier to disambiguation that is only visible in the catalog through misrepresentation introduced when a cataloger makes a best guess and misses. Advocacy for expanded access to expertise, however, most often happens through conversations with fellow practitioners and administrators on site; resolution usually is a budgetary challenge.

Advocacy for user understanding of an institution and its collection is aided by promotion or on-site display of items (L3, M6). Many practitioners discussed their contributions to the catalog as a means of promoting the institution and shaping its reputation, whether through union catalogs such as WorldCat, or by sharing collections on other platforms such as Wikidata or Internet Archive (M5, L2, A3, L5).

Advocacy for shifts in practice across the field often begin with local resolution of frictions. Many practitioners view their work not only in the context of their own institution but as members of a professional community working to improve practice, both technically and conceptually.

Through careful creation of records shared across institutions, from OCLC to Wikidata, distributed descriptions shape standards of practice. Development and sharing of specialized CVs, or other in-house standards can shape the ways that practitioners across institutions approach their work. Participation in groups such as the PCC or involvement with the design of new standards and infrastructures allow practitioners to address ongoing challenges they encounter in their work and advocate for the resources to improve both the quality of records and their experience as professionals.

Advocacy for user access is sometimes impeded by deficits in the catalog. Several practitioners shared examples of how they did or could intervene in other ways with users. Whether they proposed reference interviews (M3, M4, A2), walked people through the stacks (L8), scanned items to prevent unnecessary trips to the institution (L3, M5) or introduced audiences to the collection through their institution website's blog or video channels (M3), many practitioners noted that representation and access requires resources beyond the catalog.

Advocacy for the profession is in many ways a chronic administrative challenge, as cataloging departments remain underfunded, and backlogs of work make the task of disambiguating any item much less urgent than representing the troves of material that will remain unused as long as their existence is not registered in the catalog. Copy cataloging and automation are promoted as efficient cost-saving approaches to representation, which some practitioners associated with a devaluing of their skill and an underestimation of the complexity of the work. With shrinking cataloging departments, the workload for each person grows, yet the precarity of the profession leaves many practitioners with few options but to keep doing their best where they are.

6.4.4 DISCUSSION OF INTERVENTIONS

Representation is advocacy for resources, some more explicit than others. We can advocate for attention, for use, and for companionship. We can advocate for privacy, for flexibility, and for space. The catalog as a whole advocates for a collection to be understood by the world as a valuable thing, deserving of resources. Whether or not catalogers are thinking about these forms of advocacy, each description fills an advocative function. Every description is full of interventions.

Not all resources are readily advocated for through the catalog. Attention is to some extent an inherent resource deployed by description, which can be wielded with variable precision. A practitioner might, for example, strategically include a question mark in a record in hopes that it might flag future reassessment. Other resources, such as time and labor, are only indirectly advocated for through their records. A cataloger might share with their supervisor the number of records they have created in a week and point to the backlog of materials in an attempt to advocate for more help. Yet these resource needs associated with the chronic challenges of disambiguation are mostly unresolved through representation of items.

6.5 Designing Description

To speak of the *design* of a thing is to note its characteristics, a way of pointing to a form that could just as easily be haphazard as intentional. Practitioners in CHIs create descriptions that provide access to items and contribute to the representation of the collection as a whole. Whether or not most practitioners view this work as a design activity, their records become part of the designed environment of the catalog. The moves that they make shape what each record is advocating for. Yet representation in the settings examined here requires working with a variety of tools that have been designed in different contexts. The priorities and values of each element of infrastructure may not be shared by the cataloger—and may not be legible to them. To better understand the values and priorities of those whose designs support description, I interviewed two people working in different areas of infrastructure design, whose experiences illuminated how the possibilities for moves are shaped by upstream design choices.

In this work, I regard all of the people I have spoken with as reflective design practitioners, though the scale and scope of their designs may differ. A reflective practitioner is not only able to strategically follow rules to the letter, but can adapt to handle edge cases (Schön, 1984). Practitioners take inventory of available resources and make moves to maximize opportunities, though both the terms *resource* and *opportunity* look different across sites. Inviting them to talk about the challenges of their work allowed participants to explore the edge cases, reflecting on multiple factors that inform their work—without always providing resolutions. Following the discussion of the perspectives of infrastructure designers, I will briefly discuss the range of design activities undertaken by catalogers.

6.5.1 INFRASTRUCTURE DESIGNERS

Designing systems that will not be used by the designer requires attention to a broader context in which the project will be deployed. I include my conversations with two infrastructure designers to reflect again on the terrain in which description takes place and to highlight concerns of these designers that might be germane to approaches to designing for or with ambiguity. They ask questions in line with the interventions outlined above: What is feasible and efficient? What is ethical? What counts as warrant? What resources are needed?

6.5.1.1 Design of Context-Agnostic Vocabularies

The highly structured form of bibliographic description, supported by classification schemes and CVs, attends to a documentary universe with infinite possible permutations. Expanding and maintaining these infrastructures is the role of a small (and shrinking) number of people who work for disciplinary organizations, rather than in the confines of a single institution and its collection. ID1, who has worked both as an editor of a classification system and of a subject heading list, in

addition to their cataloging experience and ongoing professional advocacy, noted that while the stability of these systems is important, they are always in flux and not nearly as codified as many people expect.

Editors of a classification system are responsible for ensuring that these tools continue to support representation work by providing adequate and appropriate coverage of subjects and their relationships. Proposals for changes or new terms give background providing evidence of warrant, which can come from many sources. These proposals are shared with a committee of stakeholders in different institutional contexts, who provide feedback on how the changes might play out locally. Editors consider ongoing developments in subject areas, driven by emerging scholarship or cultural shifts that play out in publishing and discourse, as well as ethical concerns about existing subject representation. Proposals attend not only to warrant for changes of representation of a subject, but to potential usability and challenges in implementation by international institutions. Changes to the system must suit the needs of practitioners in international libraries and the users of these libraries. Interoperability is not only a matter of technical legibility, but of cross-cultural usability.

Editing an existing infrastructure is always piecemeal, seeking to maintain the integrity of the whole as changes are made. This requires familiarity with the logics embedded therein, and a desire to make changes that don't render the system inconsistent or illegible. Preservation of existing relationships allows modifications to be made without forcing widespread redescription of collections. Design of widely distributed representation tools must be context agnostic.

While many of these infrastructures are the legacy of aging institutions with histories of exploitation and misrepresentation of marginalized groups, the individuals currently tasked with maintaining these systems do bring critical perspectives to the work. Yet they cannot afford the time and energy to make these transformations on their own; the pace of change cannot keep up with the need for improved infrastructures. The small number of people involved in making decisions to adopt proposals is, ideally, complemented by a group of vocal and engaged practitioners who can advocate on behalf of (or against) proposals in line with their needs and professional experience. In reality, however, both the proposal and review process include only a handful of invested individuals, though engagement increases in when proposals address human identities. Just as budgets shrink and editorial staff is cut, catalogers, the most natural professional advocates, are spread too thin to participate in these debates. This shortage of labor exacerbates the slow timelines for editorial change, and yet it progresses, ingesting the churn of changes in language and shifting tack as needed.

Any changes that are implemented in the infrastructure must be warranted and considered feasible and legible for most institutions. While editors are not necessarily attending to the other tools that practitioners will use alongside this one, major changes to any one might defy the logic of another. The values of interoperability and version control guide this work and encourage editors to

offer proposals that can and will be implemented. As the editor-designer noted, many approved changes are not implemented by libraries, or are haphazardly accepted without redescription of existing collections. Therefore, changes to the scheme can lead to collocation of disparate items on the shelf, which may render relationships ambiguous to users.

The purpose of these tools is to aid in disambiguation and to minimize the cognitive friction of deciding how best to represent items in a collection. Yet editors design them without any items to represent and are not responsible for considering what might be ambiguous in the cataloging process beyond confusion around the definition and use of the terms available for subject assignment.

6.5.1.2 Design of Context-Embedded Identity Management

Work in identity management attends to the various ways that aspects of identity will be used across institutional contexts. In a large institution, these myriad functions and the rules governing them are determined by different departments. While this designer worked on multiple other projects as well, our conversation focused on the development of a tool for sharing pronouns across contexts where their information is displayed. The work of deciding what options to create and how they might be understood and used is germane to my thinking about the technical possibilities and challenges of marking differences in a record. What are the consequences of such decisions?

Identity management in a large institutional ecosystem has features similar to those found in item representation in CHI contexts. The institution must record the presence of each person with a role there; some people will have multiple roles. The information system in which this tool would be deployed is vast and primarily attends to the provision of access to resources. Most of the possibilities for representation in this system are determined by the institution, even if the individual is responsible for deciding which roles they will take on. There is no direct entry for most characteristics. The pronouns project was unusual in that it allowed (but did not require) people to add their pronouns to their institutional identity. This data would display in different places across the institutional information system, a layer of metadata intended to allow individuals to self-advocate. Designing a tool for self-representation was not technically difficult, yet understanding how the data would relate to the various functions of the system was not immediately clear.

As in the context of classification scheme editing, all changes must be warranted; interest in this tool was demonstrated by a number of stakeholders, which was in turn used to justify allocation of resources to this project. A small and evolving team of individuals who worked in identity management were put in charge of the research and eventual design of the pronoun tool. On one hand, this required mapping out the places where this tool would be deployed; on the other, it required understanding how people would make use of this functionality. Both designing for direct

self-identification and the implications of pronoun sharing were new areas for the designer I spoke with. This meant that working on this project involved an unusual amount of research, both through reading and discussion with stakeholders, in attempt to make and implement the best possible tool.

However simple in form, this design project required an engagement with a different set of stakeholders than most identity management projects. Where would this tool show up for people? What options would they have in entering pronouns? Where would their responses show up across the institution, and what outcomes might be expected from their visibility? How would people know what was going to happen with this information? This project illustrates the complexity of expanding the functionality of an infrastructure. While intended as a means for allowing for just representation and visibility of identities, the potential consequences of its implementation lie beyond the purview of the department introducing the tool.

Designing for a system oriented toward allocation of resources for individuals with institutional roles requires attention the ways that representation advocates for something. While it is simple to understand that the representation of an individual working as an administrative assistant should advocate for their access to a photocopier machine, for example, it is less clear what resources are advocated for through pronoun sharing. Efficient visibility of identity is excellent for individuals who want to be able to share their pronouns consistently without having to bring it up each time they meet someone. It was not clear whether there was in turn an expectation of the institution that those who view pronouns must do anything in response. Might there be legal implications to consider if a manager, for example, failed or refused to address someone by the pronouns they had shared in their profile? Conversely, what might be the consequences if an individual's pronouns were visible in places that they had not anticipated? How would this tool be understood by people who might have different approaches for sharing pronouns across different platforms used in their roles in the institution? Would people understand this tool as related to or distinct from representations of gender or other demographic categories?

In addition to questions about the use of these representations, this designer wondered how information systems such as these might codify modes of representation before they had culturally coalesced. The decision to allow open entry of pronouns avoided fixing the ways people might self represent. Not knowing how this tool and the data it would collect might be used in the future led to concern for the potential of pronouns to serve as demographic markers whether or not they were entered with intention to be counted as such.

The pronouns tool introduced ambiguities for both the system designers and potentially for the individuals who would use it. A user interface cannot fully explain the logic of its structure, nor can it demonstrate all of the potential the outcomes of its use. A very simple text entry field that invites someone to share their pronouns may be a welcome feature or a confusing one, depending on one's familiarity with pronoun sharing, as well as concerns about representation and privacy. If an

optional tool is not adequately contextualized, it might not be used at all—a waste of institutional resources, as well as a disservice to those who wanted the tool to cultivate a standard of practice around sharing pronouns. An identity management system has the potential to harm individuals through misrepresentation, yet the addition of infrastructure to support accurate and just representation may or may not support institutional justice. While this tool was not intended to disambiguate individuals, its introduction could both introduce and relieve ambiguity in the information system and in real-world lives of those in the institution.

6.5.1.3 Catalogers As Infrastructure Designers

In addition to the design of descriptions, many practitioners I spoke with had taken on other infrastructure design tasks during their careers. From participation in professional working groups like the PCC that shape the broader environment in which this work is done, to development of CVs to represent local collections, these expansive design tasks demonstrate an interest in not only making moves, but in shaping which moves can be made. Some regular tasks of representation, such as creation and editing of authority records, contribute to cooperative cataloging efforts and thus become widely used infrastructure.

Although the practitioners I spoke with had varying degrees of experience and expertise, all of them expressed how important it was to know and follow rules — until they didn't work anymore. In moments of uncertainty, many practitioners found strategies for systematic intervention. Rather than haphazardly describe something to the best of their ability, they often looked for patterns in the frictions they encountered or made note of ongoing conceptual or ethical issues that made representation challenging. The values of access and stewardship were held by everyone I spoke with, yet each recounted stories of finding workarounds in their approach to description that would allow them to adequately represent (or in some cases protect) those characteristics they deemed most salient.

The experiences of C1, the practitioner working in a corporate setting, were rife with breakdowns. When they entered their role, they found no standards, or even a cohesive collection of assets. They shared examples of chaos seldom encountered in CHIs, which emphasized the role that both infrastructures and institutional stakeholders have in shaping how representation and management is done. In short, it was difficult to think about the chain of surrogation when absolutely everything in the model was experience as ambiguous, including the items, and the practitioner also was forced to occupy the roles of infrastructure designer and selector.

The moves practitioners made or sought to foster were made not as individual catalogers, but as members of a community. Whether a strategy was taken in creating a record for an item or a CV was developed, most practitioners evaluated their possible moves in conversation with others. Usually these were other catalogers or professionals in their institution, but sometimes these

discussions were hashed out with community members or outside subject experts. Whether they formalized these responses in formats that could be distributed (such as CVs or crosswalks) or made notes to themselves about how they would handle a challenging situation in the future, they valued the efficiency and consistency of a repeatable intervention. Even if the infrastructures they used broke down in some contexts, they were attuned to a variety of repairs that would build future resilience or integrity into their work.

Informal design projects taken on by catalogers were, like those undertaken by infrastructure designers, often warranted by the rise of some intractable problem. Unlike those professionals whose work centered on infrastructure development, this was an added task. While the job description of a cataloger may include the expectation that they will put out fires as needed, the range of design tasks that they might take on is invisible in the records they create. Creation of descriptive records is an act of design unto itself; the systematic design of descriptions for a collection constitutes a form of infrastructure design, allowing users to trace the connections between items, to navigate to items known and unknown.

6.5.2 REFLECTIVE DESIGNERS

By considering the perspectives of infrastructure designers as well as catalogers, I hoped to better understand the constraints that shape representation. Highlighting friction or ambiguity can easily lead to a critique of infrastructures that imagines expansive alternatives. Infrastructure designers are constrained by similar forces that guide cataloging practitioners. They, too, seek warrant for changes and consider issues of interoperability and legibility in assessment of their designs. Like practitioners working in CHIs, these designers are working with limited resources in terms of labor and time; despite their role as experts in their field, they are often responsible for quickly understanding complex subjects about which they have little prior knowledge. Infrastructure designers give attention to the durability and legibility of the whole system of representation. Their work is almost always experienced by users through or in relation to various other infrastructures or systems.

In spite of these limitations, in whatever kind of design work they might do, practitioners are attentive to the consequences of their work. They create for themselves a range of approaches for thinking about what it means to do their work well. For some, getting an item in the hands of a user who is glad to find it is the primary means of assessing their work (L7). For others, representing items so that they are available to the communities associated with the collection is of primary importance (M4). For those whose description work takes place in unique contexts, such as a digitized historical codex, or a collection of working technologies, the role of description is not only to provide access but to construct a point of view, inviting the user to make sense of the world in a new way (M2, M6). Many practitioners I spoke with are motivated by issues of justice and exclusion

in representation and look for opportunities to better represent new items or to redescribe existing collections. These examples illustrate various expressions of the values of access and stewardship. They also point to a self-awareness on the part of the cataloger, who understands their role in representing items while accepting that there will be no perfect description: "As much as we try to make the catalog record completely describe the thing, it's really a very poor surrogate that can't possibly get at what the thing is and all the different reasons you might possibly want it" (L4). As one archivist reflected, "People aren't seeing your face, and people aren't hearing you speak, but they are definitely interacting with your work" (A3).

6.6 Conclusion

In this chapter, I have shared but a small portion of the conversations I had with practitioners about ambiguity and friction in relation to their work. Using frameworks I had developed for thinking about the context in which cataloging work is done, I considered the ways that individuals across CHI contexts notice ambiguity and what they do about it. In so doing, I also became a reflective practitioner experimenting with the design of my models, talking aloud with interviewees about what they noticed when they considered their work through the lens of ambiguity.

6.6.1 SUMMARY OF FINDINGS

In RQ1 I considered where ambiguity arises in information systems by asking how practitioners talk about it, what they do about it, and how they see it as limiting or liberating. While the term *arise* suggests novel action, I intended it to highlight where and how ambiguity is signaled to practitioners, either as an experience or a characteristic of an item. For the most part, ambiguity was talked about as an experience of the cataloger or an anticipated experience of the end user who was inhibited from understanding how to make sense of things.

6.6.1.1 Finding Ambiguity in Description Systems

Frictions in Description

Considering challenges in description work as friction, I saw three primary issues. Technical friction was experienced when a practitioner knew what how they wanted to represent something but were unable, due to limitations of the management system or the supporting infrastructures. Conceptual friction was experienced when a practitioner had some sense of what was present but could not decide how to best describe it given the goals and constraints of the system. This friction could be a simple issue of being unable to decide which of multiple good options to take, or it could

involve complex issues of identity and justice. Finally, experiences of material friction occurred when the practitioner encountered some barrier to sense making, due to characteristics of the item, or due to lack of resources that would aid in understanding the identity or characteristics of an item.

Ambiguity in Description

The taxonomy aided in understanding some of the more nuanced challenges of representation. Examples of each type were plentiful across practitioner experiences, but the relationships between them were slightly different than I had originally imagined. While simultaneity could be messy to represent, it was conceptually the least complicated form of ambiguity. Uncertainty, the term most often associated with ambiguity as the inverse of disambiguation, was not merely a temporary confusion. Whether the source of uncertainty was an ethical issue, or potential illegibility for end users, it was associated with intractable challenges with no tenable workaround to reach an ideal resolution. I had originally imagined strategy as a tool used by or on behalf of marginalized groups to self-represent, as a means of advocating for resources including visibility or privacy. Practitioners suggested it could be an expansive category which also included a variety of forms of misrepresentation, partial representation, and omission of metadata. Finally, residuality, a term which I used to think about identities that may change across contexts but are rendered static in records, could be used to describe many cases where the legacy of the catalog, the infrastructures that support it, or the institution itself, create forms of misrepresentation or illegibility. Residuality also captured practitioner questions about the nature of observation and description generally, as when practitioners asked how to they might highlight absences.

Disambiguation and Interventions for Challenging Description

While my original research questions imagined a practitioner encountering an item as experience of ambiguity, many of my interview participants noted that almost nothing comes to them as totally ambiguous, since anything they are asked to represent has already been rendered valuable as a member of the collection. This pre-cataloger disambiguation seems obvious, yet I had not previously considered acquisition as the initial act of disambiguation.

Practitioners responded to friction or ambiguity by attending to the values of access and stewardship through technical and ethical interventions, as well as advocacy for other resources important to the project of representation. The range of interventions suggest that addressing ambiguity is not simply a matter of resolution of uncertainty at the moment of description. Instead, we might see examples of friction, ambiguity and intervention located across the strata of representation, the sticky points where abstract values and multiple infrastructures interface with real items and real people. This interpretation of ambiguity is so vague as to be almost useless, yet with the frameworks I have used here as guides, it was possible to contextualize these peculiar outliers and think more deeply about their causes and consequences.

The pragmatism of this practice asks that everyone do their best to disambiguate, even if they understand and accept that some identities are too complex to render with certainty. Thus, no one I spoke with offered examples of ambiguity as liberating, even if they saw it as somehow real and intractable. Ambiguity was viewed by these practitioner not as an aspect of identity, but as a resource. Many practitioners used ambiguity as an affordance, something they could create in a record to offer some form of advocacy. This process of ambiguation was not deployed as a means of representing the ambiguities of an item's identity, but to protect that which is described by offering privacy or creating new associative relationships. In some cases, practitioners have reambiguated records to address previous harms.

My examinations of friction and ambiguity allowed me to explore the questions present in RQ2, which asked *what factors lead to ambiguity in information systems*. In addition to being seen as sticking points between infrastructures or the broader strata of description, we might see ambiguity as signaling conflicting values or goals for resource allocation, such a tension between access and protection. For practitioners, the question for addressing ambiguity is: how should this item count?

In RQ2b I asked how the resource allocation goals of a system affect whether something is rendered ambiguous; for this I have no direct answer. The structure of bibliographic description is intended to provide access to both items and the concepts therein, which both requires a high level of disambiguation and may render ambiguity by ascribing certainty where it was not present. Archival and museum description practices allow different approaches to representation which can contextualize items—or can allow items to remain underdescribed.

This research project provided limited means for investigating the role of community trust in issues of ambiguity, as queried in RQ2c. In institutions where items associated with marginalized communities are held or described, building trust with these communities requires development of cataloging practices that prioritize their needs, whether that means omission of certain metadata, separate item storage, or description in relevant languages. Building and maintaining trust, in part through descriptive practices, ensures ongoing care for the items as well, perhaps, as the future of the collection.

6.6.1.2 Designing for and with Ambiguity

In my final research questions, I asked how practitioner experiences of and views on ambiguity might shape practice, first by asking how observation relates to description, then by asking what could be done about or in response to ambiguity. Practitioners shared many examples of looking at an item through the lens of the representation tools they employed, starting with the concept of the collection of which an item is a member. We notice things according to the ends to which we might expect to see them used. A zine might be a periodical in one collection and an art

book in another. A book denying climate change might be taken at face value as a work of scientific literature, or be seen as an example of a conspiracy theory.

The infrastructures of description scaffold our observation process in such a way that it might seem inevitable that each of us, if we followed the rules, would understand and describe things in the same way. Conversely, encountering a description might train us to see more of its kind in the world. Each description can serve as a model, reifying not only a statement about an item but about what kinds of items are possible. While this could hold true for any kind of description, many practitioners I spoke with were very aware of the legacies of harm enacted by catalog records that reified inappropriate and incorrect identities. A library cataloger who had re-cataloged many items in African languages after they'd languished due to the invisibility of underdescription noted, "I don't understand French very well. It's not different than a piece in Yoruba that I can't read. So, to me, the two are exactly the same. So, I guess we started to question: what's the difference?" (L1). A worldview that had treated these items as perpetually ambiguous due to their exoticism could be undone by observing and describing anew. Now many of these books are understood simply as novels, as accessible as any others in the collection.

Gaining a more detailed understanding of what it means for something to be ambiguous in cataloging or other structured description invites us to respond in a variety of ways. The interventions shared by practitioners in this study largely draw on existing infrastructures and protocols for representation, but other approaches exist or could be designed. As previously discussed, ambiguity associated with material or conceptual complexity of an item might be best represented with the more open-ended narrative approaches more typically seen in archives. Where ambiguity is related to ethical issues of representation and privacy, it might be worthwhile to consider the approach of some museums that create multiple metadata schemas to allow for different representations of items for different communities, which are not all universally viewable (Glass, 2015). Wider deployment of infrastructural cues that invite practitioners to mark uncertainty, similar to the EAD tag for marking uncertainty in dates, could facilitate clear descriptions while limiting their reifying power (Technical Subcommittee for Encoded Archival Description, 2019).

Finally, as previously discussed, ambiguity can and often is deployed as an affordance in description. To ambiguate a record as an intervention, a practitioner must identify those characteristics of an item that perform advocative functions and decide which approach best suits the resource needs of the item. In some cases, this will be underdescription or omission of metadata; or an abundance or strategic set of terms. In other cases, it may be a choice to collocate an item based on resource needs rather than identifying characteristics.

6.6.2 TOOLS FOR FOCUSING ON BLURRINESS

Focusing on the blur of ambiguity has required my design of my own set of tools and standards to facilitate clarity, if not certainty, in my thinking. Sharing these tools with practitioners, I was able to evaluate them as a reflective practitioner, recognizing what they afforded and how I might continue to iterate on them. I believed both aided in this project and may have future use for others engaged in the challenging work of investigating representation work.

6.6.2.1 Reflection on Taxonomy of Ambiguity

The four major categories that I proposed in this taxonomy, simultaneity, uncertainty, strategy and residuality, each outline a context for ambiguity and suggest different approaches to its resolution. To this taxonomy, I added a fifth concept of constitutive ambiguity, which considers the possibility of ambiguity as a salient characteristic, the elimination of which might be a kind of misrepresentation. Introducing the initial four ambiguities to practitioners, I found my initial impressions of their contents and boundaries unsettled, as previously discussed. These were not classifications; many examples could be seen as two or more types of ambiguity.

These categories have limited use in concretely specifying the nature of a representation challenge. Yet their blurriness holds enough shape to allow them to function as sorting aids. By pointing to sources, consequences and potential ameliorations, these loose categories invite contemplation of challenges in description work that are often set aside as the obvious or even necessary challenges and compromises of the discipline. Rather than describing the precise contours of ambiguities, they function as disambiguation aids, inviting attention to challenges we might be used to resolving without note. Further modifications to this taxonomy could expand its usefulness as shared language among practitioners. Documenting examples of sub-types of these ambiguities, as well as a variety of interventions, might be useful for infrastructure designers who want to minimize friction and harm.

6.6.2.2 Reflection on Chain of Surrogation

Initially developed as an aid in my own consistent use of terms in my work, the chain of surrogation has been a valuable tool for thinking about the temporal and material aspects of representation from the perspectives of multiple participants in structured description. While the model says nothing about ambiguity or friction, its spatial arrangement invites the viewer to consider sites at which they are noticed.

While the practitioners I interviewed knew from the outset that I was interested in issues of ambiguity in description, it was not clear that we would have defined ambiguity in the same way. By introducing the chain of surrogation model early in our conversations, it was possible to establish some shared understanding of the work they did and the ways that it might be difficult. Thus, they

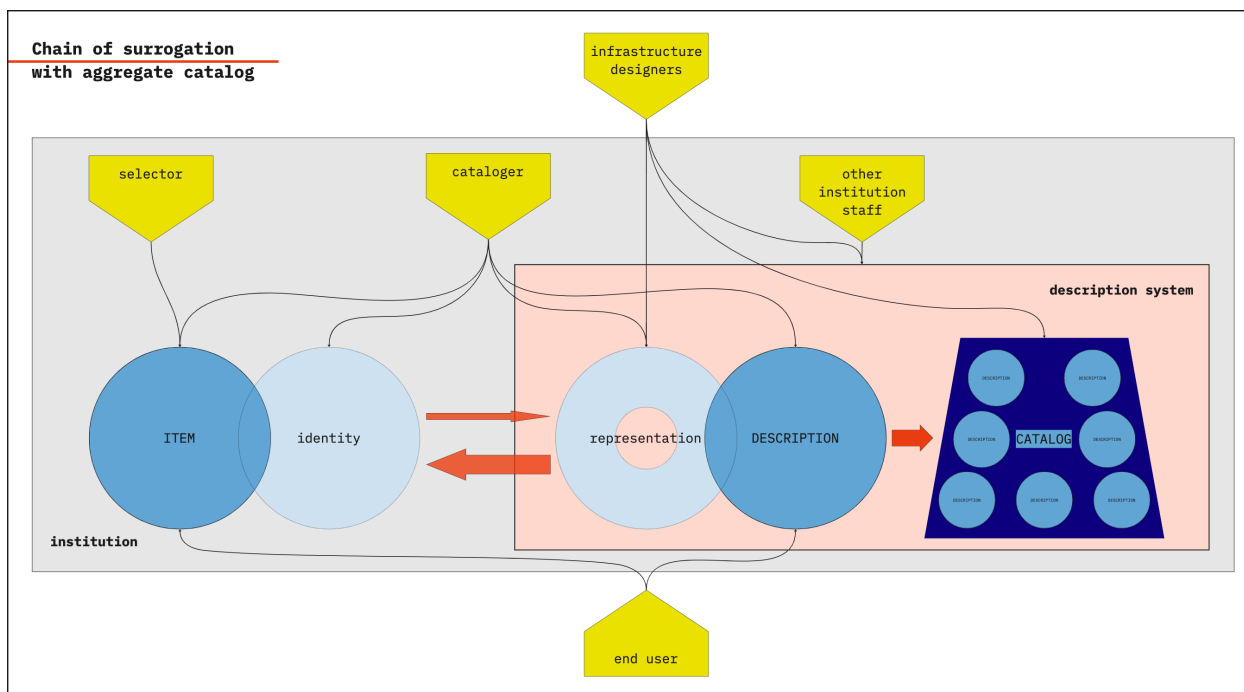


Figure 6.1 Revised chain of surrogation model with added selector role and wider arrow moving from representation to identity.

shared many examples of challenges by pointing to locations in this model as sites of encounter with an obstacle. In addition to using the model as an elicitation tool, I invited practitioners to ask questions about it or offer feedback on its accuracy as a summary of their process.

Each practitioner I spoke with found the model intelligible and resonant on some level. For the most experienced catalogers, the model seemed almost too obvious to be worth commenting on. Several noted that they are so experienced in their field that they rarely notice any difference between the identity and representation stages, perhaps because they have assimilated the goals and logic of the representation infrastructures so fully. Many other practitioners expressed satisfaction or even excitement at viewing the model, saying that it comported with their understanding of their work and made some of the confusing aspects more intelligible.

While none of these practitioners disagreed with the structure of the model conceptually or temporally, a few offered suggestions for additions or alterations, which I have incorporated into a revised model. The first change is the addition of another participant role: the selector. This is the role, usually outside of the cataloging department, that makes acquisition decisions, thus performing the first step of disambiguation by establishing the value of an item as a member of the collection. The second change included here is the increase in size of the back arrow between identity and representation. While only one practitioner expressed a strong opinion about relative arrow sizes, the larger emphasizes the way in which representation goals and infrastructures determine the identity that is rendered in description. Lastly, many practitioners discussed ambiguity and friction

as related to the catalog as a whole. I have added it in Figure 6.1 as the aggregate description of the collection.

The value of this model as a tool for investigating descriptive practices could extend beyond inquiry into ambiguity. By treating this process as institution and discipline agnostic, it may facilitate comparisons between description practices and systems. Further participants and resources could easily be mapped onto and through this model. As a research, instruction, and design tool, I believe the simplicity of the chain of surrogation model invites participation in discussion around an array of confusing conceptual and technical issues.

6.6.3 LIMITATIONS OF THIS STUDY

This study is offered as an exploration of the challenges of disambiguation in description systems and does not attempt to make generalizable claims about representation work in CHIs. Disambiguating ambiguity has been an exercise in focusing on blurriness, and at the end of this project I have only begun to determine which aspects of ambiguity could be understood as salient.

Doing the bulk of this research during the Covid-19 pandemic required investigative approaches that did not require my physical presence at a work site. While these remote interviews allowed me to speak with a wide range of practitioners located far beyond my locale, they were decontextualized from locations where work is done and from tools used to facilitate it. Unable to observe participants, I was reliant on their short verbal descriptions of their work environments and could not consider the full range of influences that shape their approaches to representation.

I chose to interview many practitioners across a wide range of sites rather than to work more closely with fewer practitioners because I wanted to elicit the widest range of examples of ambiguity or friction possible. The 90-minute length of these conversations left little time for follow-up questions. In analyzing transcripts later I often realized that I was missing some information that would have clarified an example. While the myriad ambiguities collected here provide examples of a wide range of challenges, they are not necessarily representative of common issues faced by practitioners. Having been invited to contemplate the challenging outliers, this set of examples represents extremes and does not capture many more mundane ambiguities that practitioners may address regularly.

Finally, while all participants were invited to share their own examples of ambiguity or friction, the initial framing of our conversations provided them with my own analytical tools for discussing these issues. As noted above, it would be very challenging to efficiently reach mutual understanding of the definition of ambiguity in such short interview without models to scaffold the conversation. These models were modified and expanded through this conversation, but it is

possible that practitioners would have further definitions and examples of ambiguity were they do develop and share their own frameworks for discussing these issues.

6.6.4 WHY DISAMBIGUATE AMBIGUITY?

Critical classification theory has, in the past 20 years, recognized that neutrality is neither desirable nor possible in our work. Hjørland (1995, 2009) solves the problem by advocating for contained domains in which the commitments of classification are tied to a specific world. This perspective is further explored by Feinberg (2008), who argues that classification systems have a perspective and offer a narrative about the world from that point of view. My work asks how we might understand description systems through their relationship with ambiguity by exploring the challenges experienced by practitioners who must navigate myriad strata of descriptive infrastructure.

Perhaps it is meaningless to advocate for a system that allows for ambiguity in the abstract. After all, ambiguity already exists in our classification systems and the description systems supported by them. I would suggest that being transparent about where the ambiguities lie is a possible first step in discovering alternative ways of representing those items in our collections which challenge disambiguation. Further, I believe the affordances of ambiguity might generate new design approaches for future description systems.

Disambiguation is not only a project of CHIs, but a central goal of many information systems. In order to find what we seek, we need efficient and consistent descriptions. Yet this work is complicated in any context. There are always outliers that are difficult to fit into the infrastructures at hand, which will become invisible due to lack of representation, or will be counted and understood as something else due to misrepresentation. Representation is a means of advocating for resources; thus, disambiguation, whether or not the term is always used, can be seen as a filtering process by which salient characteristics and needs of an item are marked as and for resources.

Given my curiosity about the possibility of constitutive ambiguity, this project of disambiguating ambiguity is necessarily incomplete. Nonetheless, this work suggests that there is value for practitioners and infrastructure designers in considering the limits of disambiguation systematically. Doing so may allow us to imagine alternative approaches to this work and to advocate for a variety of resources that can support items, collections, institutions, and the very practitioners on whose labor this work relies.

7 Conclusion

7.1 A Name Signifying Nothing

During World War II, concerns were mounting among those working at nuclear sites about the health effects of radiation. The field that researched this issue and developed radiation protection was given the name *health physics*. This benign term raised few alarms and signaled none of the danger with which the field is occupied. There, in plain sight, one could see yet not see the presence of a problem (Hacker, 1987).

A friend shared this story when I asked if he knew of any examples of ambiguous names that let things hide in public. The strategic ambiguity of this name, a kind of doublespeak that first calls to mind barbells or sitz baths, rather than the catastrophe of a body exposed to radiation, provoked in me a fleeting feeling of disappointment. I had asked expecting to learn of a term that allocated resources to the marginalized rather than conferred privacy on the powerful. I was not surprised, of course, and understood the purpose of coded language in this context. But it reminded me that arguing for ambiguity as an affordance cuts both ways. I have continued to seek examples of ambiguities both inherent and deployed, to expand my catalog of specimens that display its diverse characteristics, recognizing that any engagement with ambiguity will require sensitivity to the complications of blur.

7.2 Summary of Work

Ambiguity is underdescribed in KO; disambiguation moves toward certainty for pragmatic purposes but doesn't get under the hood to ask what is slowing things down. The cataloger-oriented view of ambiguity equates it with temporary uncertainty. The critical user perspective might see it as an issue of exclusion or invisibility. Neither perspective seems to capture all there was to say about it, so I have spent this project trying to disambiguate ambiguity, describe it in finer detail not only from the perspective of description practitioners or end users, but from the perspective of infrastructure designers and even the items we represent. I have not located the true ambiguity through this work, but I have found ways to notice and consider it more clearly, to think about its implications and affordances. What, for example, might we say about the ambiguity of *health physics*? What responsibilities do we have to be legible in our descriptions? What is advocated by such opaque terminology?

Some ambiguity can be seen as a tension between considering identity as identical or related to membership (Furner, 2009). Critical scholarship in KO highlights forms of ambiguity such as othering and invisibility in descriptive language, noting how perspectives limit access to information or reify harmful models of the world (Adler, 2013, 2016; Fox 2016a, 2016b). Scholars take

multiple stances on what can or should be done about this, noting that residuality is always produced by these systems (Star & Bowker, 2007) and that some identities are produced by this marginalization (Drabinski, 2013). Arguing for the retention of the history of a description does not necessarily mean we cannot update our approaches to representation, but that we should be able to view their histories as part of our understanding of the power that these concepts have had (Tennis, 2012b).

Indigenous KO critiques the models of description in these systems not only on the basis of exclusionary language, but of ontological fragmentation that strips items from their relational contexts (Littletree et al., 2020). This can be seen both as a product of the design of infrastructures that model items and information content in fragmented ways, and a challenge related to Western values of access as a universal good. Relationality in description asks us not only to represent items in their context, but to restore control of descriptive practices to knowledge communities.

Scholars in critical archives suggest comparable strategies for description, urging us to pay attention to the narratives we provide as disruption to dominant approaches to representation. Especially when describing the past, we must take care not to conflate our experiences with those of our ancestors. This is not a call to neutrality or objectivity, but a recognition of the power of identifying.

From these discourses I drew a tentative *taxonomy of ambiguity* as something other than a fleeting stage in the descriptive process.

- Simultaneity describes items with many valid and salient identities, whether due to compound materials or conceptual hybridity. It challenges our description systems with its inefficiency but is not always conceptually difficult for the cataloger.
- Uncertainty, the most common characterization of ambiguity, describes not just a moment but a variety of barriers to moving through that moment due to lack of access to the resources necessary to identify or represent an item. From damaged AV files to missing title pages, encoding standards that cannot faithfully represent an item to management systems that will not display critical fields to the user, myriad sources of uncertainty inhibit our ability to represent accurately.
- Residuality is the product of any description system, the product of interstices between categories or catalog records. The term *residual* was used by Star and Bowker (2007) to describe to the limits of representation systems to accurately depict identities that change over time but can be extended to include a wide variety of exclusions and omissions. While the cataloger may experience residuality as the sigh of resignation that a description will have to make do, it is not legible in the record.

- Strategy captures a kind of defiance, usually enacted by an individual being represented in a demographic information system, or by the stewards of an item on its behalf. This tactic can be omission of information, a kind of silence, or an intentionally partial representation. In this active attempt to take the reins in description, strategy might be seen as a struggle against residuality, or as an act of misrepresentation.

While I did not develop this taxonomy as an exhaustive or mutually exclusive accounting, it helped me to think through of a range of challenges in representation with different sources, participants, consequences, potential ameliorations. Yet none of these terms quite captured the ambiguity I came into this project most curious about. In Chapter 5, I introduced the term constitutive ambiguity to point to cases in which ambiguity is a salient characteristic, the removal of which would misrepresent identity. By naming it, I was able to think about what it would mean to surface, highlight or serve ambiguity in description. Hospitality for these items might require descriptively marking the condition. Alternatively, hospitality for the constitutively ambiguous might ask what resources are sought, which collocations would be most advocative if they could be separable from identity statements. Deeply inefficient and perhaps rare, constitutive ambiguity nonetheless allowed me to think about design for and with ambiguity as not only minimizing harm but creating opportunity.

Disambiguating ambiguity required not only exploring its contours but establishing clear definitions of the world in which description takes place. While I have made no argument that the terms I set are the real or most accurate ones, this research has in many ways been the construction of a thesaurus for the domain of description. In Chapter 4, I mapped these terms in an archaeology that identified three strata underlying and shaping the catalog and its records. The management systems used to enter and hold catalog records are the interfaces with which both description practitioners and end users experience description. These are (usually) informed by disciplinary standards, descriptive standards, terminological standards, and encoding standards. These standards are in turn informed by values held by CHIs and descriptive practitioners. I considered how two of these values, access and stewardship, are defined across CHI contexts and how they are enacted or advocated for in description systems. This exploration did not attempt to define ambiguity in the terrain, but to ask where and to whom it might be noticed. The sometimes-contradictory values of access and stewardship, which privilege different conceptions of service to users, institutions and items, suggested that ambiguity might be understood in relation to friction, where the appropriate or desirable course of action was inhibited.

To understand how a practitioner might experience these strata in the course of their work, and to anchor my understanding of the temporal process of description, I created the chain of surrogation, which contextualizes the relationship between an item and its description as a material and conceptual journey that is shaped by other participants, including infrastructure designers and end users.

With these models in hand, I had tools for inquiring more deeply about ambiguity in description but was not sure that my conceptions would hold.

In the next phase of my research, the findings of which I shared in Chapter 6, I spoke with 19 practitioners doing description work in libraries, museums, archives and a corporation, as well as with two designers of infrastructure for representation. One was an editor of standards, while the other designed identity management systems. In all of these conversations I sought to understand the goals and constraints that shape their work. Each of the 19 practitioners shared examples from the field of challenges in their work, whether characterized as friction, ambiguity or through some other framing.

While the concept of constitutive ambiguity is so anathema to the pragmatic aims of description that it was scarcely addressed, each of the other four types of ambiguity were resonant with practitioners, and my understanding of each expanded through the accumulation of their examples. These illuminating conversations included far more richness than I could address in this work, and I have limited my findings to reflections on the themes most closely tied to my research questions and my models. Many responses from practitioners expanded my understanding of ambiguity as outlined in my taxonomy. I found that although their professional goal was to disambiguate, most practitioners were intimately aware of the compromises inherent in the task and acknowledged that they were at times forcing a description to fit an item without believing it to be an accurate representation. In spite of being a practice of rule following, no one believed that the rules conferred some truth about identity. This is not a surprising finding at this date, yet it is worth highlighting if only because popular perception of library professionals especially often emphasizes their love of order as almost fetishistic. Three findings about ambiguity stand out, however obvious they might be to practitioners.

First: A practitioner in a CHI never encounters an item as fully ambiguous as we might if we found it cast off in the street. The item arrives on the practitioner's desk having been added to the collection by a selector. The initial act of disambiguation, then, takes place at the moment of acquisition, when an item gains membership into the collection.

Second: While the pragmatic commitments of practitioners run deep and disambiguation is an unwavering goal that they apply even to some cases where attempts at strategic ambiguity may be at play, when advocacy for an item requires attention to privacy or some form of justice, ambiguity is willingly deployed, often through omission of metadata.

Third: Any discussion of ambiguity in relation to an item or its record is comparatively minor compared to the latent ambiguity of the backlog of uncataloged items in most collections.

In response to the challenges encountered, these practitioners made one (or more) of three moves. Technical interventions addressed the limitations of infrastructures to represent and could range from advocacy for changes to standards to ad hoc workarounds through use of existing

features of the system. Ethical interventions addressed concerns about the consequences of representation and included both development of local CVs and strategic expansion of a category through its application to non-standard items. Ambiguation was offered as an ethical intervention. Finally, resource interventions attempted to advocate for something needed by the item or the institution. Some resources, like attention or shelf space, can be advocated for through the record. Others, like translation assistance or new equipment, must be advocated for via other means.

Throughout this work, I have viewed description as design work and considered how practitioners navigate a variety of infrastructures to make their representation moves. In the framework offered by Schön (1984), reflective practitioners are experts who can think through the possible moves they might make when presented with constraints in their domain. What they make possible is evaluated through attention to the tradeoffs of competing designs. Description practitioners perform such cyclical evaluations constantly, considering how one approach versus another would affect the value of a description to the user (or the institution, or the item). Sauperl (1999) noted that catalogers doing subject analysis took an iterative approach before settling on assignment of headings; in the end they settled not on ones that users might seek but on those that best collocated items in the collection (p. 226).

In mapping the many social and technical infrastructures of description in the archaeology of Chapter 4, my view of the field of possibility in which practitioners work expanded. Not only do they navigate the constraints of catalog entry when they engage with the interfaces of their management systems, but they must consider their possible moves as advocates for items, their institution—and themselves. The ability of practitioners to expertly design representations in service of institutional goals, however, is an undervalued skill. As noted previously, across institutional contexts, backlogs of uncatalogued materials become the burden of latent ambiguity against which the ambiguities lingering in existing descriptions are seen as comparatively minor. Yet the value that the service of expert catalogers provide seems chronically under-appreciated by institutions with short-staffed cataloging departments. Attempts to address the backlog through automated cataloging services may help get items in users' hands more quickly, but the success and value of a description is difficult to evaluate once it is in the catalog. The record can be a proxy for the practitioner's work only through tallying completed entries but is not readily legible as a unique design.

7.3 Reification and the Export of False Certainty

While this project examined ambiguity in representation in the context of CHI description, these issues surface in many other contexts. From medical records to e-commerce platforms, we interface with surrogates of items (and people) constantly. Most of the time, the ambiguities in

surrogates are invisible to us, functioning as placeholders until we encounter some friction that causes us to reevaluate the constellation of characteristics that have been brought together.

Quirky and good-enough representations can make sense in the context of a single institution, but our records are increasingly exported and linked; with each additional unanticipated place they show up, the compromises of description become less legible and seem more real. Designing for and with ambiguity might allow us not only to do justice to the edge cases, but to provide a more accurate reckoning of the work that goes into many of our descriptions.

While automation might be able to help solve some of our problems addressing the backlog of latent ambiguity, it still requires that we operationalize salient characteristics in a uniform way. Rather than provide greater certainty about membership, some analytical approaches deeply trouble the categories or classes they seek to codify. In the biological sciences, for example, DNA sequencing can help identify fragments as belonging to a particular species. On the other hand, such sequencing can also inform us that the category we believed stable is spurious.

During the course of this research, I was introduced to a lichen biologist. I spent hours talking with her about the ambiguities of that taxonomic group. It was she who shared Linnaeus's characterization of them as the "poor trash" of vegetation and explained to me how this attitude prevailed for so long that they have only recently gained researcher attention. Perhaps Linnaeus's judgment was borne of frustration at the challenges of morphological analysis of these specimens, which take surprisingly divergent forms in different contexts. Only in the past decade have biologists begun to understand these symbiotic organisms. Their existence relies on a relationship between a microbial and a fungal partner; their name is determined by the later. Their classification is a bit messy, as a lichen can look very different depending on the microbial partner. Recently, DNA analysis has demonstrated that some lichens have two fungal partners. As a form of certainty is established in the scientific understanding of the field (via DNA analysis), an ambiguity emerges around all previously classified exemplars. The suggested way of handling these double salient identities was to assign class based on the fungal partner with the largest biomass in the specimen. Such measurement is not only inconvenient; it could have ramifications for the way science describes identity across species. To operationalize identity based on biomass would disrupt our understanding of many species, including humans. To selectively use this method for determining identity only for some species might disrupt the interoperability of scientific research. To name a lichen for its most abundant fungal partner might undo our understanding of ourselves.

7.4 Making Representation Count

It remains to be seen whether this identification of lichen disrupting biological classification is hyperbolic. Likely some workaround will be established, or biologists will accept an incongruous approach to classification in the interest of interoperability with previous research. We employ

metrics to assign identity of all kinds of things in the world, whether identifying flora and fauna through DNA sequencing or assigning indexing terms in journals. In so doing, we quickly lose sight of what once seemed ambiguous and happily accept friction-reducing interventions, even when their results are less precise than their laborious predecessors.

When we disambiguate, we may believe that we are representing with increasing certainty. In many cases, however, we are no more certain about the identity of what is before us. Yet the pragmatic goals of representation allow us to advocate, both for items to be understood as resources that are inventoried in a collection, and as potential recipients of resources including attention, care and security in the form of shelf space or salaries for those who provide custodial services. I now propose that we view ambiguity as a disconnect between an item and the way(s) it can or does function in relation to resources. By representing, we are advocating for an item to be understood as belonging in some way, to count for something. Especially in cases where our initial encounter can be described as fraught by ambiguity, this act of refining through description is one possible design move. This is not to say that our approach is wrong, but that it is not always true. Perhaps by understanding this work as design for advocacy, rather than striving toward certainty we could better represent items as resources and secure resources on their behalf. While we may not be eager to view ambiguity as a salient characteristic worth preserving or highlighting, this approach may invite us to see ambiguity as an affordance that we can use in the design of both infrastructures and descriptions.

7.5 Ambiguous Design

What might mean it to design description systems with or for ambiguity? Several possible interventions or approaches to challenges in representation have been considered in the KO literature. Littletree et al. (2020) have called for relational approaches to representation that maintain ties between items and the relationships that matter in their community context.

We hold the objects in our hands, try to come up with the best words to describe them, think about where they fit with regard to similarities and differences from other objects in our collections, and then move on to categorizing the next set of objects. But without understanding these objects as expressions of Indigenous systems of knowledge, we risk mislabeling objects, reducing them to a mere characteristic description, separating them from other expressions needed for their use and interpretation, and evacuating them of their meaning. (Littletree et al., 2020).

Rather than identity inhering in the object, they suggest it is created through relationships. Centering relationally as the authors call for would involve design of infrastructures to support contextual description, created and administrated by or with the communities to which the objects belong.

Taking the view that queer identities are formed in relation to normative ones, Drabinski (2013) calls for a recognition of the limits of corrective representation. While adding inclusive language, as called for by numerous scholars cited throughout this work, can provide broader access to items by reflecting the terms used by people, we should not imagine that there will be a time when the language of description can accurately reflect all identities. While this might be seen as a non-intervention in the catalog, Drabinski urges reference conversations to aid library users in navigating the structures and histories of description. This perspective can be seen as complementary to the value of marking the ontogeny of a subject as suggested by Tennis (2012b). Taken together, these approaches suggest not that we disambiguate or reambiguate, but that we mark records to reflect the conceptual histories that attend description while preserving the collective integrity of the collection.

Archival perspectives on description offer different possibilities for capturing salience and offering care for collections. While the narrative possibilities in archival practice can seem like a welcome affordance in comparison with bibliographic description, Duff and Harris (2002) warn that “the narrative construction attempts to give to them a shape, a pattern, a closure- to end the inevitable openness, close off their referents” (p. 275). Instead they call for “hospitality” by making room for approaches to description that do not require uniformity and bring in the perspectives of their users. Carter (2006) suggests that the best approach to just representation might sometimes be the allowance of silence.

To these suggestions, I would like to consider a few more. The first, ambiguation, has already been discussed in this work, while the others consider how we might represent ambiguities more directly.

7.5.1 [RE]AMBIGUATION AS ADVOCACY

...It is worthwhile asking, locally and each time, what medicine is making of a patient's problems as it opts for one reductive possibility rather than another.

(Mol, 2002, p. 247)

An acquaintance asked me what my research is about; I told her that I am thinking about ambiguity in description. She lit up. She is a mental health provider who focuses on helping families navigate care for children who have been flagged as difficult—often described as having oppositional defiant disorder. The description wasn't exactly wrong, she said, but the classification wasn't quite right—and it was not easy to clear from patient records even if their challenges were resolved. Her preferred tactic was to diagnose them as having *adjustment disorder—unspecified* (DSM-5 309.9 F43.20; ICD Code 7B23). Adjustment challenges, she explained, could be related to changes of all kinds, from puberty, to moves, to parental divorce. The implication of the term *adjustment* is that it can and will take place. The disorder exists but is understood as transient, a

diagnosis through which the care provider can advocate for resources but which can be eventually evacuated.

Not all diagnoses offer such flexible advocative power: she also told me of a person who has been fighting to remove a diagnosis of bipolar disorder from their medical record, as it increases the cost of health insurance and prevents them from securing life insurance. This diagnosis had been wrong; in fact, they suffered from a form of dysmorphia that was easily resolved with a common medication that years of prescriptions to treat bipolar disorder had failed to touch.

In these stories, we see the advocative consequences of representation in securing care, and the harmful consequences of misrepresentation, both linked to the assignment of codes from the same standards, DSM-5 and ICD. Behavioral and mental health challenges in young people, while distressing, can be to some extent inscrutable, especially when newly emergent: why is this happening? This practitioner had been strategic in the description of her patients, representing their difficulties with a term that both rendered them legible in the health care system and liberated them from the constraints of an unshakable diagnosis. The application of a vague description might be seen as a form of *reambiguation*, in that the blurriness of the description matches that of the condition.

7.5.2 INCONVENIENT METHODS: SLOW CATEGORIZATION

Several years ago, I began doing an odd activity with MLIS students I worked with. Each group in my class was assigned to watch a very short video on YouTube, about a minute long, recorded without narration, probably on a phone. The metadata for the videos I had selected was shoddy, often only a vague title that perhaps indicated a location, along with the usual platform-generated details. Groups of three students would watch the same video. First they would watch it once or twice on their own and write a short statement stating what it seemed to be of or about. Then they would watch it several more times. My instructions were intentionally vague: try to make 20 short observations on sticky notes in the next five minutes. No more than a few words each. They could attend to any senses; if one could imagine how a place might smell, they were welcome to jot that down as an observation.

With the group, they would share their observations and collectively sort them into six clusters. This was an arbitrary number, but I was curious to see what categories they would come up with. At the end of the session, each group would have a strange assortment of categories that had varying levels of connection or fidelity to the original video.

The clusters were interesting, but the point of the exercise was to facilitate weird conversations about something that didn't make a lot of sense. What to say about the salience of an evening goat race in Trinidad, a market in Kabul, a shopping mall in Krakow, or a people walking past a flag waving over a fountain in Los Angeles? There was almost always some detail that one

student lit upon that changed everyone's impression of what was significant about the video. Some groups would rewatch together, looking for more evidence to bolster their new narrative. Occasionally a group would handle everything in such an orderly fashion, using categories like *clothes* or *colors*, that there was no sense they had watched a particular video at all. The arbitrariness of the six categories bothered some people, while others found ways to justify the logic of their six. Some groups created a miscellaneous category, others designed categories that could offer hospitality to all observations, while a few shoved inconvenient sticky notes into a hidden pile.

While this exercise hardly leads to innovations in infrastructure design, it has been a useful tool in helping students to think about the challenges of description as a collective practice, and to easily imagine a variety of implications for different strategies in representation. Whether done with MLIS students or Informatics undergraduates, the frictions and ambiguities of this activity force participants to slow down and notice not only their own metacognitive processes but those of their collaborators. There is no clear evaluative metric, no way to verify they are doing it right. In this confusion, many students find themselves asking complex design questions, becoming reflective novice practitioners working through their moves.

Borrowing the concept of *slow looking* from education researcher Shari Tishman (2017), I have referred to this practice as *slow categorization*; though it would be possible to do alone, the delightful strangeness that students have found valuable comes from doing it collaboratively. Similarly uncomfortable design activities have been used by Bill Gaver (2014), who suggests that design asks, "what works?" through a range of unusual experimental projects that invite participants to navigate situations that could be described as ambiguous. These projects consider not only the results or efficacy of designed objects, but the affective and sense-making experiences of the participants. Such methods are well suited to exploring something that is often made visible only through the friction it creates.

Drabinski (2013) suggests that library professionals ought to educate users on the foibles and occlusions of the catalog. I similarly believe that these collaborative engagements with navigating ambiguity in description and sorting might invite richer understandings of the design and use of representations. These activities could be interesting for a variety of groups, from end users to description practitioners, but especially for infrastructure designers. Introducing this activity to aspiring user experience (UX) designers has provided a chance for them to consider issues that are often discussed in theoretical terms or are introduced as ethical challenges for which they are unprepared. In this activity, without anticipating it, students have found themselves arguing about the implications of not only a taxonomic structure, but the conceptual content and valence of categories. As curious as I remain about ambiguity in description systems, I sense that more can be done to address these issues through the education of designers than through the training of catalogers. A variety of other observation and design activities attending to friction and ambiguity are included in the zine at the end of this dissertation.

7.5.3 NOT-ITS: A MAP OF FALSE RESEMBLANCES

The sky in Tucson was dark enough on a moonless night for a local stargazer to host a telescope viewing from a platform in a field of saguaro cactuses. My family attended, eager to extend our vision's capacity and see what we did not know was there. Our host highlighted constellations and explained the seasonal arrangement of the heavens. Swinging the scope to a different part of the sky, he refocused and invited us to peer at a Messier object. The sky, he said, was scattered with these celestial bodies that had been mistaken for comets in the early days of telescopic observation. Charles Messier, an 18th-century French astronomer, weary of reports of "discoveries" that he had already lit upon, created a catalog of each of these faux comets. The collection was intended to minimize erroneous comet reports by mapping their lookalikes. While these 110 deep-sky objects are now known individually, with names such as the Great Pegasus Cluster (M15), Dumbbell Nebula (M27) and Sombrero Galaxy (M104), the Messier objects have retained their status as a set. I was delighted by this story of a catalog that exists solely to designate non-belonging to a category.

In my commitment to exploring constitutive ambiguity, a map like this appeals as a possible approach to being legible without being identified as a member of category. The resemblance of each of these objects to comets seems laughable now that our deep-space telescopes shoot back images of swirls and bursts that seem to share no morphological characteristics. But for a time, in the blurriness of early telescopic, they shared membership of non-membership.

How might we design descriptive systems that allow for such approaches to designating identity? How could we allow for items to have such elastic binds? I am not sure how to begin imagining this as an interface, yet I will continue to gather examples of odd tools and slanted metaphors that seem to get at what it could mean to describe the ambiguous.

I am similarly taken by explorations of positive and negative space. There was a year a decade ago when I almost compulsively cut scenes out of hearts of lightweight interleaving paper. I had no plan when I began to cut a line with the sharp tips of my scissors, which would eventually get so long that the paper would begin to fall away, revealing both the positive and negative space. While I removed no discernible edge between the two, the cut was the margin of difference between what was seen and what became unseen when a portion of the paper eventually fell to the floor as two lines to meet.

These examples resist the pragmatic value of description, but formal attempts at understanding resemblance and partial membership can be seen in research on fuzziness. Language allows us to signal conditional membership through use of hedges including "sort of a..." or "almost a..." (Lakoff, 1973). Formally applying fuzziness to categories and membership involves the assignment of portional membership (a measurement between zero and one, with membership



Figure 7.1 A picture I cut from a folded piece of paper in 2012. I did not have a plan when I cut paper; the line emerged from the scissors and I only knew the positive space once the void fell away.

characteristics more present having a higher value). Perhaps it would be possible to allow some fuzzy hedges into our descriptions by evaluating their characteristics on a similar scale, but description systems rely on consistent and literal interpretations of identifiers. While there might be value in applying these methods to a consideration of design approaches to ambiguity, I am drawn to the less quantitative approaches of the visual metaphor that don't suggest a tidy resolution.

7.6 Conclusion: Therkelson's Scrapbooks

When I finally made it to the Prelinger Library for the first time last summer, it was a hot day, and I only had an hour. Buzzed in by the docent and offered a La Croix, I set my bag down. The room was small for a library, but the feature for me was the unique classification system I'd been hearing about since I began my research. I made my way down the first row. It all started right there: a linear ontology that spanned from San Francisco in one corner and ended across the room in outer

space. I moved slowly down the aisle, trying to absorb something about the order, but got waylaid as I moved down the aisle/coast to my hometown of Santa Cruz. An assortment of oddball publications beckoned me. Printed in sepia ink with smudgy photos of longhaired men at the beach, they captured a time and place that was fading by the time I became conscious in the hot-pink 80s. But their ethos had prevailed in the redwood-silled windows hung with stained glass and bundles of eucalyptus in my friends' houses. I wanted to dwell in the familiar. The docent offered to help me scan anything I wanted, so I set the books next to the LaCroix. Before long I was inspecting hundred-year-old telephone books from St. Louis, the gilt spine of a tome on electricity, industry journals on advertising, books on Chicano power, and reports on BART infrastructure. It seemed like everything important had been captured, though I wasn't sure how or why the Prelinger's sensibilities of salience felt so resonant to me. I had wandered the stacks in a similarly enchanted way in libraries ordered by LCC or DDC, yet this stroll did not feel like serendipity as much as an interaction with a poem.

I sat down and tried to take notes on the experience. I was here to absorb the alternative logic of a bespoke classification scheme and felt I should reflect on the affordances of ambiguity. But it didn't feel ambiguous; it felt multiple, it felt like both and nothing, it felt like hospitality was possible not only for all of the volumes, but for the visitor who related, somehow, to the identity of the whole place. I scanned the book from Santa Cruz and talked to the docent, who sat at a table paging through a massive scrapbook. Full of mid-century newspaper clippings about a single San Francisco neighborhood, this book—and dozens more like it—was the work of a man named Norman Therkelson (who passed away just weeks ago). For decades, he documented changes to the Bay Area through clippings that recorded development projects and small news bits that would have been lost to time if not pasted down. My parking meter expired as I marveled at the tight narratives that Therkelson composed without any explicit narration of his own. Using ready made stories, he composed something new, so radically simultaneous and residual and strategic and uncertain that I still don't know what to say about them. Except: the ambiguity of their form invited me in. I could not enter the scrapbook to extract information, at least not without getting a sense of the collection of them as a whole, and the scope of each volume, which would contextualize what he had pasted down without any comment in his own words. I could only enter it slowly and without expectation, attending as much to the use of space on each page as to the headlines and columns of text that were nestled together, removed from their original sources. Then I could know it, even if I couldn't quite say what it was about.

The arrangement of items in the Prelinger Library invited contemplation of what it means for categories to occupy space, but these scrapbooks, so lovingly homed in the most suitable institution possible, reminded me of what I had wanted to think through when I began this project. I had at last found an item in a library whose ambiguity seemed to be a defining characteristic. Yet

this ambiguity did not seek privacy or opacity of any kind: it sought the hospitality of attention, allowing the reader to collocate it as belonging in a multitude of ways.

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I present this dissertation as a reflection on my attempts at focusing on blurriness. As a contribution to the field of KO, I believe my models and methods for exploring friction and ambiguity can aid in communication about the work that representation does and that description practitioners execute. These approaches can also help other stakeholders in the field to think through a variety of challenges they might encounter in working with descriptions.

The relevance of these research questions and findings extends beyond this field. Ambiguity is everywhere; designing with and for it, whether in CHIs or medical systems, might reduce the harms of misrepresentation not only by replacing the terms we use but by making space for forms of non-representation, placeholders for emergence or transformation.

In our conversation about the design of the infrastructure to support pronoun sharing, ID2 worried that deploying the wrong tool might “defuture” explorations in self-representation. Would this small module in a vast information system truly be inclusive? Would it affect our expectations of social exchange around pronoun sharing? Or would it reify a set of limiting terminological possibilities?

I hope that my work contributes to the continued and expanded care for all items, but especially those that puzzle the viewer. I hope, too, that this work contributes to expanded care for the practitioners who make our infrastructures work by attending to the details of what is present, desirable, and possible.

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APPENDIX A: RECRUITMENT AND INTERVIEW MATERIALS FOR STUDIES

The following materials were used to recruit and guide interviews with participants in this research:

- Recruitment email and talking points for Ambiguity and Identity Study (included with IRB application)
- Consent for nonbinary participants in Ambiguity and Identity Study
- Consent for practitioner participants in Ambiguity and Identity Study
- Sample interview materials for nonbinary individuals in Ambiguity and Identity Study
- Sample interview materials for practitioner participants in Ambiguity and Identity Study

**Recruitment email and talking points for Ambiguity and Identity Study
conducted by Lilium Rajan**

Talking points for professional participants

Participants are sought for a study examining ambiguity and categorization. Do you work in categorization, classification, segmentation, or archival description? Have you had at least one experience where correct or appropriate identification was difficult? This could be due either to qualities of that which you categorized, or due to limitations of the system used to facilitate description. We are seeking interview participants to discuss these cases. How did you decide how to address the situation? What compromises were you aware of as you navigated your decision? What challenges were you seeking to mitigate?

If you have experience that you think would be relevant and would be open to discussing your case in a 60-90 minute interview, contact Lily Rajan at xxx-xxx-xxxx or rajanl@uw.edu

Talking points for adults who identify as gender non-binary

Do you identify as gender nonbinary? Are you willing to discuss your concept of your nonbinary identity and your experience of self-identification on forms such as social media, medical intake forms, insurance, etc? When and how is identifying outside of current standards harmful, and when is it liberating? What resources are we advocating for when we self-identify? What role does privacy have in determining how to identify in these systems?

Lily Rajan, a doctoral student at UW, is conducting dissertation research on representation in classification and categorization systems. She is particularly interested in how systems are handling or not handling the representation of identities that challenge traditional notions of categories. Her research is motivated by questions of how our information systems might better serve our diverse needs. While Lily does not identify as nonbinary, her work is informed by her own experience with a racial identity that has been often marked as “other.”

If you have experience that you think would be relevant, are over 18, and would be open to discussing your experience in one or two 60-90 minute interviews, contact Lily Rajan at xxx-xxx-xxxx or rajanl@uw.edu.

UNIVERSITY OF WASHINGTON
CONSENT FORM
Ambiguity and Identity

Researcher: Liliun Rajan, doctoral candidate, Information School, University of Washington 206-
xxx-xxxx

Researcher statement: I am asking you to be in a University of Washington research study. This form gives you information to help you decide whether or not to be in the study. Being in the study is voluntary. Please read this carefully. You may ask questions about the purpose of the research, what would be asked of you, and anything else about the research that is unclear.

PURPOSE OF THE STUDY

This study investigates how we make decisions around categorization or classification in cases where either identity is uncertain OR the tools used to facilitate categorization are limited in their ability to represent correct or favored identities.

It is possible that discussion of past challenges around identity and representation could lead to some mild discomfort. Some participants may find it difficult to describe their concepts of self-identity to a researcher who is not a part of their community. You are free to not answer any questions that may cause discomfort during the interview or you may choose to withdraw from the research study at any time.

BENEFITS OF THE STUDY

Benefits of this study may include design interventions and practitioner understanding of how to better represent nonbinary and other marginalized populations in information systems.

Participants will be compensated with a \$30 gift card upon completion of their interview.

STUDY PROCEDURES

Participants in this study will be interviewed for 60-90 minutes. In some cases, two interviews may be scheduled.

Interviews will ask individuals who self-identify as gender nonbinary how they conceive of their own gender and how they approach self-representation in information systems such as social media, medical forms, insurance, etc. Questions will address experiences of self-identification in systems as well as socially, with an emphasis on what resources are advocated for through self-representation. Issues of privacy, harm and liberation in relation to nonbinary identity will be discussed.

Participants may refuse to answer any question or item in any test, inventory, questionnaire, or interview.

Interviews will be audio recorded.

CONFIDENTIALITY OF RESEARCH INFORMATION

All recordings and notes will be stored in password protected computer. Paper documents and artifacts will be stored in a locked office at the University of Washington. I may potentially use de-identified information in publications and presentations.

1. Do you give permission to participate in this research? YES / NO
2. Do you give permission for the researcher to use direct quotes from the interview(s) in publications or presentations? YES / NO
3. Do you give permission for the researcher to use de-identified information in future research projects? YES / NO

Subject's statement

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have questions later about the research, or if I have been harmed by participating in this study, I can contact the researcher listed on the first page of this consent form. If I have questions about my rights as a research subject, I can call the Human Subjects Division at (206) 543-0098 or call collect at (206) 221-5940. I will receive a copy of this consent form.

Printed name of participant

Signature of participant

Date

Copies to: Researcher
 Participant

UNIVERSITY OF WASHINGTON
CONSENT FORM
Ambiguity and Identity

Researcher: Liliun Rajan, doctoral candidate, Information School, University of Washington 206-
xxx-xxxx

Researcher statement: I am asking you to be in a University of Washington research study. This form gives you information to help you decide whether or not to be in the study. Being in the study is voluntary. Please read this carefully. You may ask questions about the purpose of the research, what would be asked of you, and anything else about the research that is unclear.

PURPOSE OF THE STUDY

This study investigates how we make decisions around categorization or classification in cases where either identity is uncertain OR the tools used to facilitate categorization are limited in their ability to represent correct or favored identities. It is possible that this discussion could lead to some mild discomfort. I believe that the risk is quite low. You are free to not answer any questions that may cause discomfort during the interview or you may choose to withdraw from the research study at any time.

BENEFITS OF THE STUDY

Participants may benefit from discussing how they handle challenging cases or from the results of the study, wherein the approaches taken by other professionals are shared. Benefits of this study may include design interventions that guide future navigation of challenging categorization.

STUDY PROCEDURES

Participants in this study will be interviewed for 60-90 minutes. In some cases, two interviews may be scheduled.

Interviews will address cases where individuals who do categorization or classification activities for work encountered a situation that challenged their sense of how to best describe or identify an item or category. In addition to describing the challenging item or category, interviewees will discuss the process by which they approached their work and challenges they anticipated as outcomes from this work. Finally, they may be asked to discuss how they would handle a hypothetical challenging future case using the tools of their trade.

Interviews will be audio recorded.

CONFIDENTIALITY OF RESEARCH INFORMATION

All recordings and notes will be stored in password protected computer. Paper documents and artifacts will be stored in a locked office at the University of Washington. I may potentially use de-identified information in publications and presentations.

1. Do you give permission to participate in this research? YES / NO
2. Do you give permission for the researcher to use de-identified information in future research projects? YES / NO

You may contact Lily Rajan at (XXX) XXX-XXXX anytime you have questions about the research. You may contact the UW Institutional Review Board at (206) 543-0098 or by email at hsdinfo@uw.edu if you have questions about your rights as a research subject or what to do if you are injured.

Your participation in this research is voluntary and you will not be penalized if you refuse to participate or decide to stop. Signing this document means that you have had a chance to ask any questions that you have about the study and that you voluntarily agree to participate.

Subject's statement

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have questions later about the research, or if I have been harmed by participating in this study, I can contact the researcher listed on the first page of this consent form. If I have questions about my rights as a research subject, I can call the Human Subjects Division at (206) 543-0098 or call collect at (206) 221-5940. I will receive a copy of this consent form.

Printed name of participant

Signature of participant

Date

Copies to: Researcher
 Participant

Sample interview materials for nonbinary individuals in Ambiguity and Identity Study

- How do you visualize gender? (Participants are invited to draw their concept of gender)
- How do you conceptualize nonbinary (flickering, oscillating, opting out)?
- What opportunities does your gender identity provide? How is it liberating?
- Given a selection of gender options (*showing forms for marking gender found from real systems, sampled below*), how would you think though this? What assumptions do you have about these categories and their use? What questions would you have for the organizations that create these systems?

Demographic form examples (show to participants as slides, one example at a time)

Example 1: (anonymized university survey)

1. How do you identify your gender [select all that apply]

- Male/man
- Female/woman
- Non-binary (i.e., non-binary, genderqueer, genderfluid, etc.)
- Agender
- Not listed (please specify) _____

2. Are you transgender (that is, do you identify as anything other than sex/gender you were assigned at birth)?

- Yes
- No
- Unsure (please specify if comfortable doing so)

Example 2: (medical intake form)

1. Gender

- Male
- Female
- Transgender Male (Female to Male/FTM)
- Transgender Female (Male to Female/MTF)
- Genderqueer, neither M or F
- Choose not to disclose
- Other gender _____

2. Sex at birth

- Male
- Female
- Choose not to disclose

Example 3: (social media)

- Agender
- Androgynous
- Androgynes
- Androgynous
- Asexual
- Bigender
- Cis
- Cis Female
- Cis Male
- Cis Man
- Cis Woman
- Cisgender
- Cisgender Female
- Cisgender Male
- Cisgender Man
- Cisgender Woman
- F2M
- Female to Male
- Female to male transgender man
- Female to male transgender man
- Female to male transsexual man
- FTM
- Gender Fluid
- Gender neutral
- Gender Nonconforming
- Gender Questioning
- Gender Variant
- Genderqueer
- Hermaphrodite
- Intersex
- Intersex man
- Intersex person
- Intersex woman
- M2F
- Male to Female
- Male to female trans woman
- Male to female transgender woman
- Male to female transsexual woman
- Man
- MTF
- Neither
- Neutrois
- Non-binary
- Other
- Pangender
- Polygender
- T* man
- T* woman
- Trans
- Trans Female
- Trans Male
- Trans Man
- Trans Person
- Trans*Female
- Trans*Male
- Trans*Man
- Trans*Person
- Trans*Woman
- Transexual
- Transexual Female
- Transexual Male
- Transexual Man
- Transexual Person
- Transexual Woman
- Transgender Female
- Transgender Person
- Transmasculine
- Two-spirit
- Two-spirit person
- Two* person
- Woman

Sample interview materials for practitioner participants in Ambiguity and Identity Study

I will seek to interview both library catalogers and archivists, and may talk with individuals who work in museum collection descriptions as well. I will ask them to come to the meeting with a particular example or two in mind and we will discuss the following:

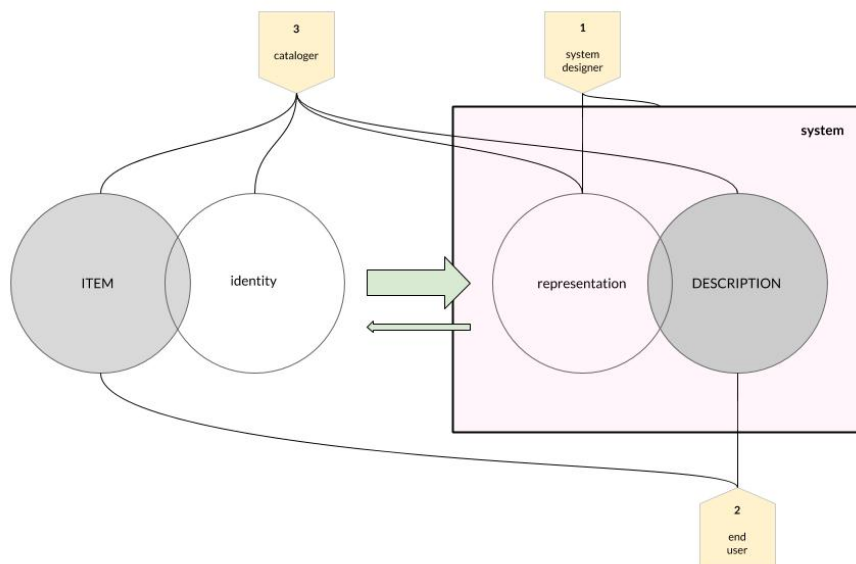
- What was the item?
- What made it difficult to describe?
- Did you feel that you knew what it was or how it should be described?
- How did your tools aid or hinder this process?
- What approach did you take?
- What approach would you have liked to take?
- Do you feel that your description was accurate? If not, is there any way you could imagine rendering it more so? What might that look like?

Materials shared with interview participants (shown on slides, one at a time)

Chain of surrogation diagram

Chain of Surrogation

Model moves from item to description, both concrete, through identity and representation, both abstract. Three primary kinds of people interact with this system, starting with system designers and ending with users. The *identity* stage includes a tension between approaches: identity or best fit. The *representation* stage attempts to map the identity to the priorities of the system, which can include considerations of both item access and resource allocation.



Types of ambiguity

Simultaneity When an item has characteristics associated with or belonging to multiple identities to the extent that none are an exact fit. Eg: “This could be described many ways!”

Uncertainty When the practitioner is unable to determine the identity of an item or to assign it an appropriate representation due to missing information, lack of familiarity, or questions about the limitations of the system of description relative to that item. Eg: “I don’t feel like I have enough information about the item OR about the best practices for describing an item like this to describe it.”

Strategy When the identity of an item is concealed (fully or partially) from the practitioner OR by the practitioner. The reasons for strategic ambiguity can include distrust of a system, a desire to present in a particular way in order to access resources associated with a different category, or in order to protect particular information from universal access. This is often seen in relation to human identity and to indigenous knowledge. Eg: “I don’t think that this item belongs to everyone; I would like to protect it from exploitation.”

Residuality When the identity of an item changes contextually, usually due to changes in temporal or geographic context. This kind of ambiguity may be largely a product of the limitations of a system that require a single and unchanging identity. It may also include cases where the not-fitting becomes constitutive of the identity of the item. Eg.”The central aspects of this thing change depending on where it is, yet it changes often enough that any attempt at representation will be inaccurate before long.” OR “The fact that this thing doesn’t fit is really important to understanding it.”

APPENDIX B: TABLE OF PRACTITIONERS AND INFRASTRUCTURE DESIGNERS

DESCRIPTION PROFESSIONALS & INFRASTRUCTURE DESIGNERS			
<p>In this research project, I interviewed 19 individuals who engage in description work on behalf of a variety of institutions, as well as two infrastructure designers. The experience of each was unique, reflecting the context of the institution as well as their prior experiences. Several interviewees had previously worked in other institutions or served in other related roles that came up in their conversations. All but one of these subjects work in the United States. For the sake of simplicity I organize them here by their roles at the time of conversation but include relevant past experience in my description of each.</p>			
Code name	Library practitioner role	Library practitioner description	Audience for description
L1	Cataloger of non-English materials in academic library	L1 catalogs a wide range of materials. Most of our conversation centered on cataloging non-English materials in a variety of languages and scripts, none of which are spoken by the practitioner. L1 also works on a variety of Wikidata projects.	Researchers, communities of origin of materials
L2	Cataloger of science and special collections in academic library	L2 primarily does bibliographic cataloging of publications on science, as well as special collections materials including art books and art objects. L2 also has worked to improve infrastructures by petitioning LCSH to add subject headings and by developing crosswalks for tools in frequent use at their workplace.	Students, researchers, instructors
L3	Resource description for works in Arabic and Persian at academic special library	L3 works in a special library in the UK, where they were hired for their language expertise. They have no formal training in cataloging and have learned on the job. Their examples centered on the challenges of using the U.S.-oriented LCC and LCSH to represent non-English materials from the Middle East in a British copyright library. They have previous experience working in an art museum and occasionally mentioned descriptive practices in that institution.	Students, communities of origin of materials, national library
L4	Cataloger of maps and serials in academic library	L4 is an experienced cataloger who has worked with many materials, including maps, but largely focuses on serials. L4 is also an active contributor to an open-source library management system.	Researchers, institution, fellow catalogers
L5	Metadata librarian for digital resources in academic library	L5 has a unique role in their institution as a metadata librarian for digital resources, many of which are held by external groups. This role requires engaging with participants outside of their worksite and finding ways to appropriately describe many sensitive materials. Their work can include sharing descriptions to Wikidata.	Communities of origin of materials, Google searchers, institution
L6	Cataloger of special collections in academic library	The role of L6 is highly specialized, focusing on cataloging special collections materials from the 21st century related to a religious group in a region of the US. The range of materials in this collection is highly variable, from self-published books to toys.	Researchers, institution

DESCRIPTION PROFESSIONALS & INFRASTRUCTURE DESIGNERS

L7	Cataloger of music and maps in academic library	L7 is a very experienced cataloger in an academic library, with experience describing a wide range of materials. Their focus on music includes both recordings and sheet music and requires deep musical knowledge. L7 also contributes to the infrastructures of description through activities such as participation in PCC and experience proposing additions to LCSH.	Searchers of all types, both novice and expert
L8	Cataloger of non-English materials in academic library	L8 is an early-career cataloger of materials in non-English languages (primarily Balkan languages). As a native Farsi speaker, L8 has rich experience navigating the catalog as an outsider and is sensitive to the limitations of description infrastructures in representing items to support discovery by native speakers. Given their language background, L8 often must navigate double translation into and out of English.	Students, reference librarians, communities of origin of materials, catalogers
L9	Cataloger for law library	L9 does copy cataloging in a law library using LCC and LCSH, neither of which provides robust coverage of topics related to legal concepts. In addition to speaking about their current professional work, they included examples from previous jobs they had where more original cataloging was possible.	Legal researchers
Code name	Museum practitioner role	Museum practitioner description	Audience for description
M1	Archaeology collections manager museum of natural history and culture	M1 has decades of experience working with archaeology collections. Existing CVs are inadequate for describing many items, so they have developed local approaches. Description of these items is often challenging, as little metadata accompanies them. Identifying items sometimes requires use of tools such as a microscope or, occasionally, chemical analysis. Provenance and provenience are critical characteristics in the absence of more identifying information on these “gifts from the ground.”	Interested public, archaeology researchers
M2	Metadata description specialist for digitized 16th-century codex on behalf of art museum	M2, an art historian by training, was brought in for the special project of creating a metadata strategy and CV for describing images in a digitized 16th-century codex. The original was written in two languages, each with with a distinct epistemological stance, and is translated into English. M2 created metadata in all three languages to provide access to the informational content in the non-textual elements of the codex. This project involved working with software developers to decide how to best handle the technical and display challenges.	Researchers, students, institution, speakers of languages in original codex

DESCRIPTION PROFESSIONALS & INFRASTRUCTURE DESIGNERS

M3	Cataloger for contemporary art museum	M3 does cataloging for a contemporary art museum. Their work is shaped by an unwieldy management system that does not reflect current preferred approaches to representation. The embedded CVs are full of omissions and errors and cannot be easily edited. The collection includes many materials that were merged from another institution and thus inherited a peculiar hybrid classification scheme. In addition to managing this frustrating system, M3 supervises student catalogers and is thus attentive to the goals of representation in the context of this collection. Additionally, M3 does acquisition work, rare among practitioners in this study.	Curators, students, educators, interested public
M4	Manager for living cultures of the Americas collections in museum of natural history and culture	M3 views the work of cataloging cultural heritage materials in this museum as caretaking of collections that belong to indigenous communities. Representation in an institution with a long history and colonial legacy requires attention to redescription of existing collections as well as new acquisitions. M3 has developed CVs to support representation of these materials; this nomenclature has been adopted by other institutions.	Communities of origin of materials, curators, interested public
M5	Librarian and archives manager for art museum	While M5 served as a librarian in an art museum, the range of materials handled and the institutional concerns of the art museum have led me to discuss their work in the museum context. The library of the art museum serves curators and other staff in the museum, as well as researchers. M5 routinely worked with archival materials as well, and handled special collections materials that were occasionally moved into the art collection. While LCC and LCSH were used for this collection, they were modified to suit local needs, which required knowledgeable design responses on the part of this practitioner	Institution, curators, registrar, docents, educators, interested public, fellow catalogers
M6	Manager of a touch-and-play lab with a collection of working technology	As the manager of an unusual collection that is affiliated with but not fully supported by a university, the roles that M6 fills extend far beyond cataloging. Our conversation centered on their experience inheriting a student-designed CV and collection management system that was not adequate to the collection needs. M6 is able to create both the management system and the CV for this unique collection but tries to do so with future catalogers in mind. Because this collection consists of functioning technology, many items are deaccessioned as they stop working; sometimes their parts are salvaged and reaccessioned--and then pulled into other devices that need repair. The relationship between wholes and parts is an ongoing challenge in this collection.	Students, interested public near and far

DESCRIPTION PROFESSIONALS & INFRASTRUCTURE DESIGNERS

Code name	Archive practitioner role	Archive practitioner description	Audience for description
A1	Archivist at a community college	As an archivist at a community college, A1 is responsible for describing a variety of collections that relate to the history of the school. At the time of our conversation they were digitizing student newspapers and providing descriptions at the article level in Omeka. Previously, A1 has worked in corporate and state archives.	CC faculty and staff, alumni
A2	Processing archivist for a university library	The collections held by the university archives where A2 works focus on historically marginalized communities that have typically been excluded from institutional care in the region. Many of the challenges encountered in this work relate to language around race and the limits of contemporary CVs in contextualizing historical materials.	Students, researchers, regional community
A3	AV archivist for a nonprofit AV preservation organization	The non-profit organization that A3 works for provides AV preservation and description services for a variety of other institutions. This work includes handling and digitizing original AV materials, which are often damaged in ways that changes their informational content. Description can range from simple inventory to richer representations that accompany items and are shared publicly via the Internet Archive. A3's experience thinking about and describing damage or error in relation to items is unusual compared to most practitioners in this study.	Institutions of origin of materials, interested publics, fellow archivists, error enthusiasts
Code name	Corporation practitioner role	Corporation practitioner description	Audience for description
C1	Manager of digital assets for an education organization	The lone corporate cataloger in this study, C1 manages materials created within the institution for instructional purposes. There was no clear framework accomplishing this task, so in addition to managing these assets, C1 was attempting to develop a coherent CV while lacking a clear sense of the ontological priorities of the many stakeholders in the company. This work was further complicated by the poor alignment of the CMS with the materials in the collection. In a previous role, C1 worked in digital asset management for a museum.	Institutional stakeholders including curriculum developers, instructors, marketing team

DESCRIPTION PROFESSIONALS & INFRASTRUCTURE DESIGNERS

Code name	Infrastructure design role	Infrastructure design description	Audience for work
ID1	Editor of a classification system	In the role of editor of a classification system, ID1 was responsible for considering changes to the scheme. This work included writing proposals that provided warrant for changes, participating in committee meetings on proposals, and communicating the work of the editorial committee on a blog. Another role as editor of a subject headings list required attention to similar issues of warrant for change. Their experience as an academic library cataloger has informed their work in infrastructure design. Additionally, ID1 made, and continues to make, a personal effort to encourage professional participation in conversations around critical cataloging.	Professional governing bodies, international libraries, practitioners
ID2	Identity management designer for institutional IT group	As a designer of the identity management system for a large institution, ID2 primarily worked to implement tools that would facilitate access to various resources for individuals associated with the institution. While most of these tools were deployed by the institution and are not modified by the individuals they link to, the project I discussed with ID2 allowed for user input, or self-representation. Although this tool for sharing pronouns was a small task on a technical level it was necessary to map the upstream constraints and downstream implications of its implementation. ID2 worked with several stakeholder groups on this project in an effort to deploy a tool that would be beneficial to individuals and functional within the management system.	Institution, members of institutional community, IT team

APPENDIX C: ZINE

This dissertation is accompanied by a zine and activity guide. It is included here in two formats: a print-cut-assemble version, and a linear PDF that shows each page in order, including the front and back covers.

To print and assemble:

1. Print the following six pages as double sided copies.
2. Cut each page in half length-wise.
3. Fold the resulting six panels in half.
4. Assemble in order.
5. Staple or stitch binding.

“Strategic ambiguity is not silence or evasion; it’s a choice to take on a certain amount of risk, to play with fire, to appropriate something that is used against you and make it work for you.” -Ralina Joseph

“We hold the objects in our hands, try to come up with the best words to describe them, think about where they fit with regard to similarities and differences from other objects in our collections, and then move on to categorizing the next set of objects. But without understanding these objects as expressions of Indigenous systems of knowledge, we risk mislabeling objects, reducing them to a mere characteristic description, separating them from other expressions needed for their use and interpretation, and evacuating them of their meaning.”

-Sandra Littletree, Miranda Belarde-Lewis and Marisa Duarte

“Representing material in a kaleidoscope fashion also affords ambiguity in a positive sense. Fracture and vignette allow sorting and resorting (or remixing). They can help resist ordinality, a given hierarchy of things.”

-Susan Leigh Star and Geoffrey Bowker

WHAT IS THIS ITEM?

When I began my doctoral studies, I was interested in the leftovers or detritus of categorization and classification. I wanted to understand what made something *miscellaneous* or *other*. My interest was theoretical, pragmatic, and personal. Over time, my questions were reoriented in alignment with the language of the disciplines of description, and I began to ask

what makes something ambiguous?

This framing was informed by the drive in description toward disambiguation. While the term treats ambiguity as a kind of temporary uncertainty, I wondered whether it might be explored as something more than that. My dissertation expands the framing of ambiguity in description systems beyond this transient experience. This zine shares a bit of my work and invites the reader to explore ambiguity through a series of *slow categorization* activities.*

*Instructions are variously plausible

ADVOCATING FOR AMBIGUITY

I began this project wary of the ways that disambiguation can lead to misrepresentation of constitutive ambiguity. I imagined that describing these characteristics would require marking their resistance, allowing them to claim non-membership and allowing whatever opacity they presented. I recognized that such an approach runs contrary to the pragmatic ethos of the disciplines of description and is deeply inefficient.

While my concerns about the limits of disambiguation remain, I have become more convinced that viewing description as a form of advocacy might allow us to allow ambiguities their place while still ensuring they are represented in a manner that facilitates their membership along some lines, as recipients of resources.

These questions might be strange to ask in the context of the library, museum, or archive where identity is largely determined by inclusion in a collection, and where the backlog of un-described items can be seen as a massive latent ambiguity in the collection that far exceeds the ambiguity of any one item. Yet these sites allow us to imagine what it means to represent heterogeneous assortments of identities in a systematic manner, to inventory and manage what is present while imagining a range of future possibilities.

By recognizing that ambiguity is sometimes impossible to resolve in the logic of a system, and in turn to view ambiguity not only as fact, but as a feature or affordance, might help us to do better by that which we seek to represent.

Disambiguating ambiguity
Or,
Looking beyond uncertainty
as the source of ambiguity in
description systems

a dissertation by
LILIUM RAJAN
2023

University of Washington
iSchool

Disambiguating Ambiguity

A ZINE ACTIVITY GUIDE
to accompany

Controlled Vocabulary

REPRESENTATION A representation stands in for something in some context; to do representation work is to decide what needs representing in a given context.

DESCRIPTION A description is a form of representation that highlights the salient characteristics of a particular thing.

UF catalog record; finding aid

DESCRIPTION SYSTEM A description system is a set of tools and rules

(infrastructures) that standardizes description of many things so that they can be inventoried, discovered, and retrieved in a consistent and efficient manner.

UF catalog BT information system

ITEM An item is a thing represented in a description system, whether the unit of

analysis is single object or a collection.

UF document, resource, object, archival collection, etc.

INSTITUTION In this zine, a cultural heritage institution (CHI), or institution, refers to an establishment that collects items, including libraries, museums and archives.

UF organization

Put the item you are considering in front of you. This will be your *comet*, so to speak, the thing which other things are mistaken for.

Consider a variety of characteristics that might make it seem similar to other things. No need to stick to physical features. How does it move, sound, smell?

Create a list of at least 15 things that could be mistaken for your thing.

Don't be too literal. Imagine encountering from a distance, with gloves on, in another language.

To make this nice, draw a picture of each item. It can be blurry but should demonstrate how it could be mistaken for your item.

Suggested listening: *Prisencolinensinainciusol* by Adriano Celentano

For this activity, you can return to the item you considered in the MAP CONSTRAINTS activity. Or you can pick another item. You could even pick yourself.



A BRIEF DESCRIPTION OF DESCRIPTION

A description is a form of representation that highlights the salient characteristics of a particular thing.

A description is an instruction on how to make sense of something.

A description is a surrogate of a thing that draws our attention to its role and relationships.

A description advocates for a thing to be understood as a resource and as a recipient of resources (including attention, protection, space, and labor).

A description allows an item to be intelligible by both an institutions and its uses, facilitating both inventory and access.

A catalog is a set of descriptions that represent a collection.

DISAMBIGUATION is the practice of describing each item in a collection at a level of detail such that one can distinguish between similar items.

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Think about the things you did in a short span of time, say four hours. For example, -wake up -drink coffee -clean the sink -feed the cat -put gas in the car -eat a snack

Now make a parallel list of things you could have plausibly done at each moment but did not do. Finally, make a parallel list that is less plausible but still possible given the time and place you were in.

Make these three parallel lists visually interesting to you. It can be sloppy or precise. Maybe you want to make each list in a different color, or make one blurry. There's no right way to do this.

This is not intended to be a reflection on how to make a better choice. Notice how actions sometimes flow from one another and sometimes are pretty haphazard. What we do and what we say about it suggests something was significant. Maybe it was. Maybe it was just the next step.

"The Cervantes text and the Menard text are verbally identical, but the second is almost infinitely richer. (More ambiguous, his detractors will say—but ambiguity is richness.)" Jorge Borges

CONSTITUTIVE AMBIGUITY

"Though incomplete I was working in these statements to identify marginally as much more than a site of deprivation, in fact I was saying just the opposite: that it is also the site of radical possibility, a space of resistance." bell hooks

to misrepresent it.

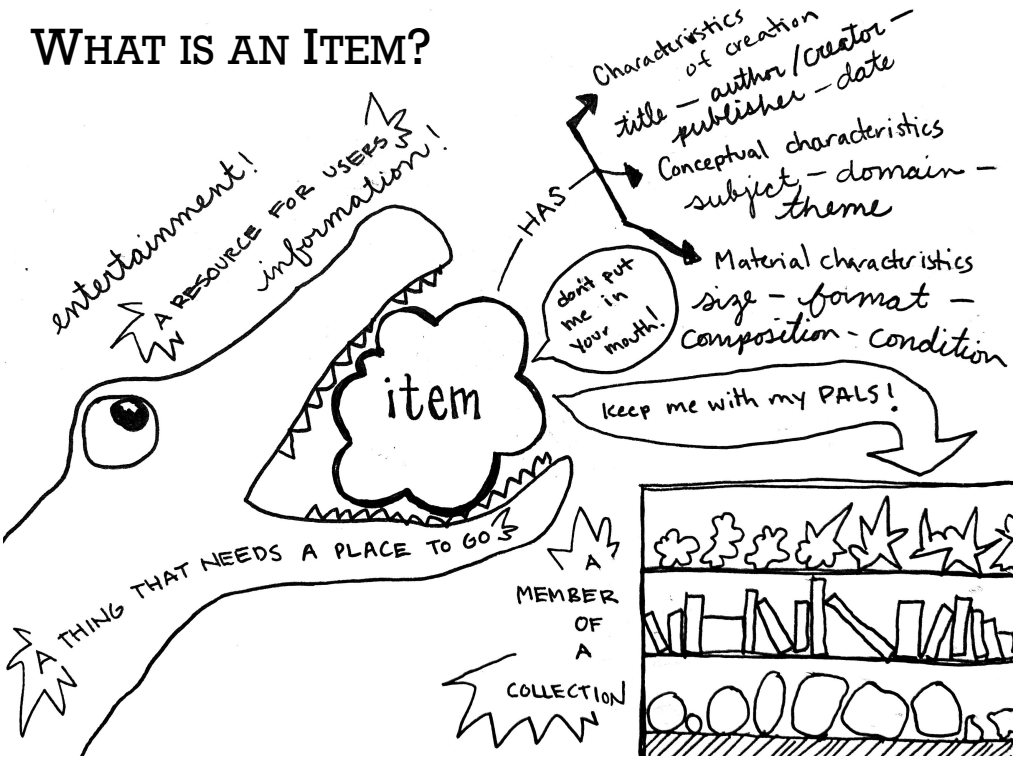
Sometimes ambiguity is the salient characteristic.

to disambiguate constitutive ambiguity is

ambiguity can be an affordance.

"...maybe experiencing the world as less worded, as gesture, vivid image, can be seen not as lack but as resource." Lars Horn

WHAT IS AN ITEM?



MESSIER OBJECTS

In the 18th century, French astronomer Charles Messier was annoyed at all the false reports of comets circulating among his peers. Advances in telescopes had expanded the frontier for heavenly observation, and eager gazers repeatedly mistook some far-off phenomena for these icy dusty detritus of the solar system.

So Messier created an inventory of these not-comets in hopes of saving everyone the disappointment of discovering another non-discovery. While images of these celestial objects viewed through today's telescopes make it difficult to imagine mistaking them for comets, their designation as members of the Messier set remains.

I am inspired by this inventory of not-its, this catalog of close-but-not-quotes. If we wanted to acknowledge the impossibility of disambiguation in some cases, to honor constitutive ambiguity while still attempting to represent it, the Messier approach could serve as model. What might the ambiguous be mistaken for?

Consider your item as a resource. What aspects of it would you expect users to find most interesting, informative, or entertaining? Who do you think would be most glad to find it, and how would they describe it? How would you best advocate for it to receive the attention it would need to be found?

Now consider some less-expected ways this item could be used as a resource. How would you signal its potential value from this perspective?

Finally, consider what resources this item needs or might desire. What kind of space does it need? Maintenance or care? Specialized labor, such as translation or historical contextualization?

Which of these resources are most easy to describe and advocate for? Which are most difficult to signal?

For this activity, you can return to the item you considered in the MAP CONSTRAINTS activity. Or you can pick another item and pretend it is in a collection.



My grandparents, Mary and K.V. Rajan | Buena Vista Park, California | July, 1949
Both were born and raised in South India. This photo was taken while they were students at Howard University.

I have found that while ambiguity can be alienating, it can also create openings. To eliminate ambiguity may reduce harm in some cases. In others, it, might reduce possibilities.

What does it mean to be Indian? To be from the West? What does it mean to be both and neither?

Myself included.

descriptors have often confused people.

the United States, whose identity

My interest in this topic is borne of personal experience as a racially ambiguous person in

COWBOYS OR INDIANS?



This one is good to play in the car with friends or kids. Pick a set of words that are often treated as synonyms and consider how they might differ.

How are they interchangeable?
How are they distinct?


What do they advocate for?
What mood do they evoke?

*
The word pairs here might not particularly contentious, but you will find some that spark intense opinions and feelings.

*
Why does it matter how we describe things? How can a single word help or hinder us in finding what we seek?

- nice | kind
- information | data
- dwelling | home
- fuzzy | furry
- contraption | gadget
- funny | humorous
- ambiguity | uncertainty

This is weird. What does it have to do with description?



I am interested in the relationship between items and their proxies or surrogates. When and how do they capture the important parts? What makes something important? If you made a beautiful shadow, would it feel less like a silhouette and more like an image of you?

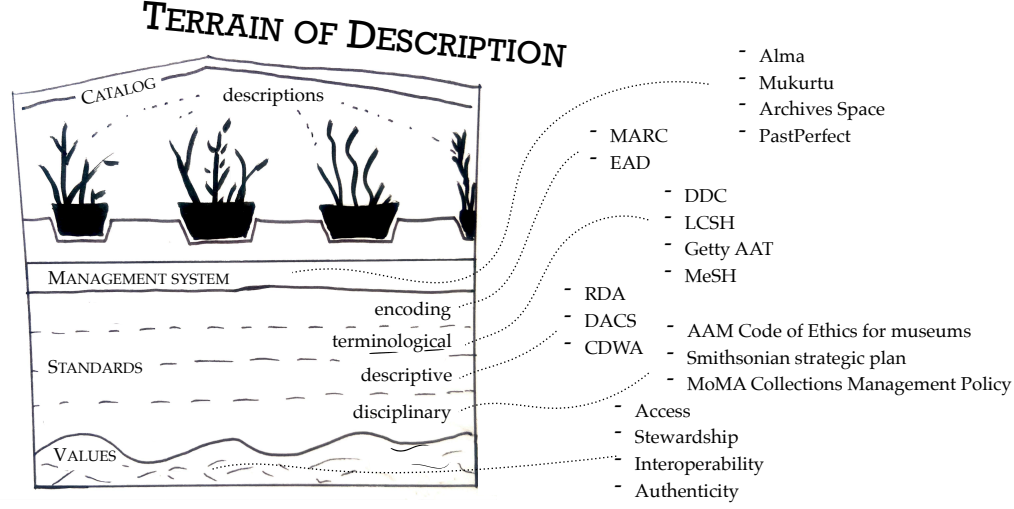
1. Cast an interesting shadow with your body and take a photo of it.
2. Print the photo and trace the shadow. (If you have a table, you might be able to trace the shadow directly on the screen.
3. Cut out the shadow shape.
4. How much does this silhouette feel like a representation of you?

For this activity, you will need a camera, a printer, tracing paper, and scissors.

For this activity, find an item to describe. It could be anything, but you will be treating it as though it were a part of a collection in an institution of your choosing or invention. Scratch paper might be nice to have at hand.

1. Decide why this item belongs in the collection. This is your first constraint, your justification for each subsequent observation of the item. The rationale can be quite simple (ex: "This is a collection of shoes made in 2019").
2. Without describing the item itself, try to notice the kinds of characteristics that would be significant and the tools you would use both to observe and to describe these features. Try to come up with at least characteristics and their methods of evaluation or description. (Ex. Measurement, dating, creator attribution, etc)
3. Nicely done! If your first pass at this was primarily visual, expand your sensory and imaginative capacities and select another set of characteristics and methods of evaluation.
4. What characteristics were most difficult to observe? Which are most difficult to evaluate and describe? Could your set of evaluative and descriptive constraints be used to observe a different item?

ACTIVITY: MAP CONSTRAINTS



Multiple social and technical infrastructures shape what is desirable and possible to represent in description systems. The **management systems** in which descriptions are created and stored determine what we see. They in turn are shaped by multiple **standards**, including *encoding, terminological, descriptive and disciplinary* standards, each of which is created and maintained by different groups or institutions. These standards are informed by myriad **values**. In my work, I considered the ways that the values of *access and stewardship* inform descriptive practice.

DESCRIPTION IS DESIGN

The infrastructures that support description, from standards to mission statements, serve as material constraints that shape the design of descriptions. Catalogers and other description practitioners (archivists, curators, etc.) design representations that will work in their institutional contexts.

DESCRIPTION IS ADVOCACY

We are accustomed to the idea that representation allows us to advocate, as when we vote for politicians who (we hope) will speak on behalf of our community's needs. Description is a form of representation that advocates for a range of resources including:

- translation
- repair
- money
- maintenance
- labor
- marketing
- ATTENTION
- Care
- collocation
- display
- SPACE
- Storage
- Shelves

ABOUT IDENTITY

Identity can refer both to the unique and to shared characteristics. An identifier like a social security number focuses only on the unique, making no attempt to categorize. Description must both signal a unique specific item and highlight which characteristics it shares with other items in a collection.

While practitioners did not often see ambiguity as a salient feature, they practiced various forms of *AMBIGUATION* as a means of advocating for some items. Ambiguation practices included intentional omission of metadata; adding multiple, potentially dichotomous subject headings; and placing an item in an unexpected category or physical location to make it more or less visible to users.

Ethical responses attended to the needs of various stakeholders and sometimes broke with standard practice in order to serve the needs of a item, its creator, its community of origin, or its users. This could include redescription, underdescription, and advocacy for changes to the language of description.

Material responses required advocacy beyond the catalog for resources to aid description, including support with specialized labor such as translation or restoration, or for specialized tools such as lab equipment for chemical analysis.

Technical responses involved changes to the infrastructures that support description, whether by advocating for changes to controlled vocabularies or visibility of more fields to end users in a management system.

How can we respond to ambiguity? How can we design with or even for it? Practitioners in my research took three approaches:

INTERVENTIONS

For this project, I developed a taxonomy to help me spot ambiguities beyond uncertainty. These are not mutually exclusive categories, but the four primary types do suggest distinct consequences and ameliorations.

Use this checklist to see if you can find examples of each type as you encounter frictions in the world of description.

STRATEGY	RESIDUALITY	UNCERTAINTY	SIMULTANEITY
<ul style="list-style-type: none"> — Privacy: When an item does not follow rules of description to preserve privacy for item or creators — Temporal: When the description system cannot represent another context cannot be fully understood due to issues of time, geography, language, etc. — Spatial: When an item does not follow rules of description to advocate for it to be an item because it depends on location — Refusal: When an item does not follow rules of description as a form of protest against the system 	<ul style="list-style-type: none"> — Emergent: When an item is not yet adequately understood because it is of a type newly observed or created — Fragmentary: When an item is incomplete due to damage — Transitional: When an item from another context cannot be fully understood due to issues of time, geography, language, etc. 	<ul style="list-style-type: none"> — Hybridity: When an item fully integrates two or more form, genre or subject — Incompleteness: When an item does not fully grasp (like a dataset) that the what is present 	<ul style="list-style-type: none"> — Immediacy: When an item has many relevant identities — Multiplicity: When an item has many relevant identities — Incompleteness: When an item is so big (like a dataset) that the viewer cannot fully grasp what is present — Hybridity: When an item fully integrates two or more form, genre or subject



1. Individually, watch the video once and write a short sentence saying what it is about.
2. Individually, watch 8-12 more times, making observations on sticky notes that highlight features you notice. Use no more than 4 words per description. Aim for 20 or so observations.
3. As a group, compare your observations. What did everyone notice? What was a surprise?
4. Collectively create 5-7 categories to sort all of your notes together.
5. What seems to be the story when you look at the categories and their contents? Was this difficult?
6. Do the categories align with the first sentence you wrote after watching the first time? How did your sense of what happened in the video shift?

For this activity, work with at least two other people.

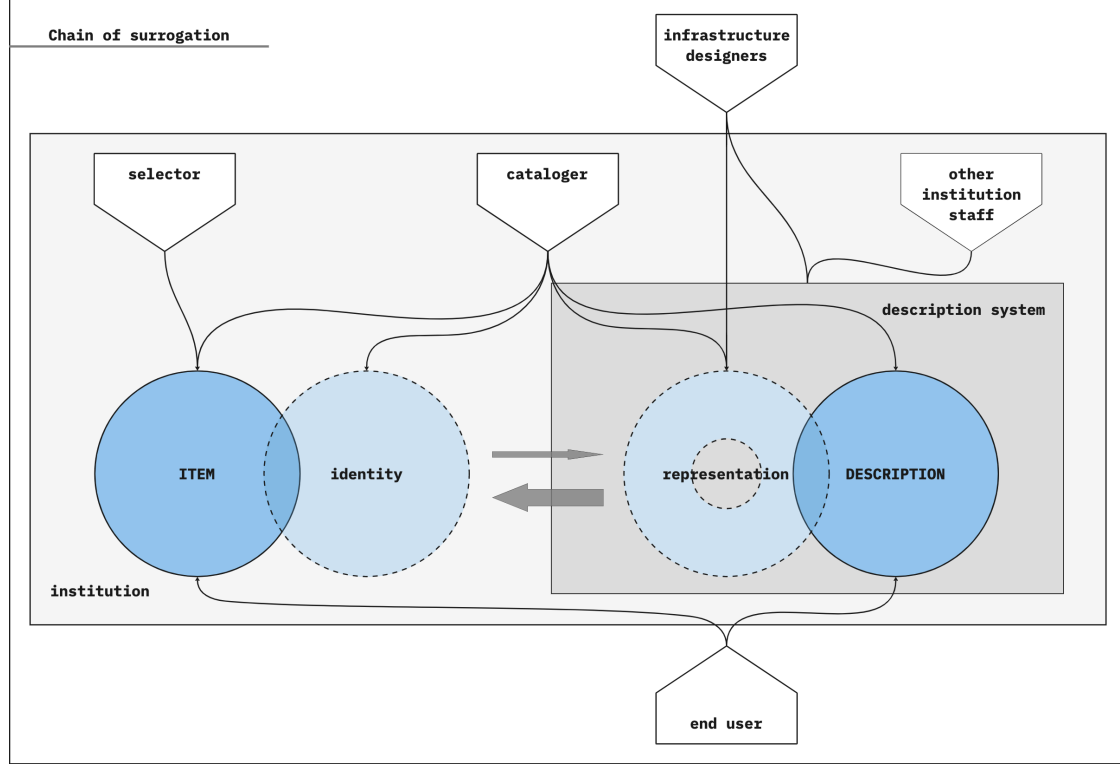
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Is the friction due to a type of ambiguity seen a few pages ago?

Is it related to the perspective or need of a specific participant?



CHAIN OF SURROGATION

The world of description is full of ambiguity in how we refer to things: so many words have multiple meanings! To make my thinking clear, I decided to stick to single terms to point to stages in the description process and mapped it as a temporal process.

We begin with an **item** and ending with its surrogate, the **description** in a catalog. To get there, we have to consider the conceptual **identity** of the item and translate that using the rules and tools of **representation**. A variety of participants or stakeholders are involved, some within and some outside of the institution.

This chain of surrogation model allows me to ask:

Where is ambiguity located? Who notices?



Disambiguating Ambiguity

A ZINE ACTIVITY GUIDE
to accompany



Disambiguating ambiguity
Or,
Looking beyond uncertainty
as a source of ambiguity in
description systems

a dissertation by
LILIUM RAJAN
2023



University of Washington
iSchool

Controlled Vocabulary

REPRESENTATION *A representation stands in for something in some context; to do representation work is to decide what needs representing in a given context.*

DESCRIPTION *A description is a form of representation that highlights the salient characteristics of a particular thing.*

UF catalog record; finding aid

DESCRIPTION SYSTEM *A description system is a set of tools and rules (infrastructures) that standardizes description of many things so that they can be inventoried, discovered, and retrieved in a consistent and efficient manner.*

UF catalog **BT** information system

ITEM *An item is a thing represented in a description system, whether the unit of analysis is single object or a collection.*

UF document, resource, object, archival collection, etc.

INSTITUTION *In this zine, a cultural heritage institution (CHI), or institution, refers to an establishment that collects items, including libraries, museums and archives.*

UF organization

WHAT IS THIS ITEM?

When I began my doctoral studies, I was interested in the leftovers or detritus of categorization and classification. I wanted to understand what made something *miscellaneous* or *other*. My interest was theoretical, pragmatic, and personal. Over time, my questions were reoriented in alignment with the language of the disciplines of description, and I began to ask

what makes something ambiguous?

This framing was informed by the drive in description toward disambiguation. While the term treats ambiguity as a kind of temporary uncertainty, I wondered whether it might be explored as something more than that. My dissertation expands the framing of ambiguity in description systems beyond this transient experience. This zine shares a bit of my work and invites the reader to explore ambiguity through a series of *slow categorization* activities.*

*Instructions are variously plausible

A BRIEF DESCRIPTION OF DESCRIPTION

A description is a form of representation that highlights the salient characteristics of a particular thing.

A description is an instruction on how to make sense of something.

A description is a surrogate of a thing that draws our attention to its role and relationships.

A description advocates for a thing to be understood as a resource and as a recipient of resources (including attention, protection, space, and labor).

A description allows an item to be intelligible by both an institutions and its uses, facilitating both inventory and access.

A catalog is a set of descriptions that represent a collection.

DISAMBIGUATION is the practice of describing each item in a collection at a level of detail such that one can distinguish between similar items.

WHAT IS AN ITEM?



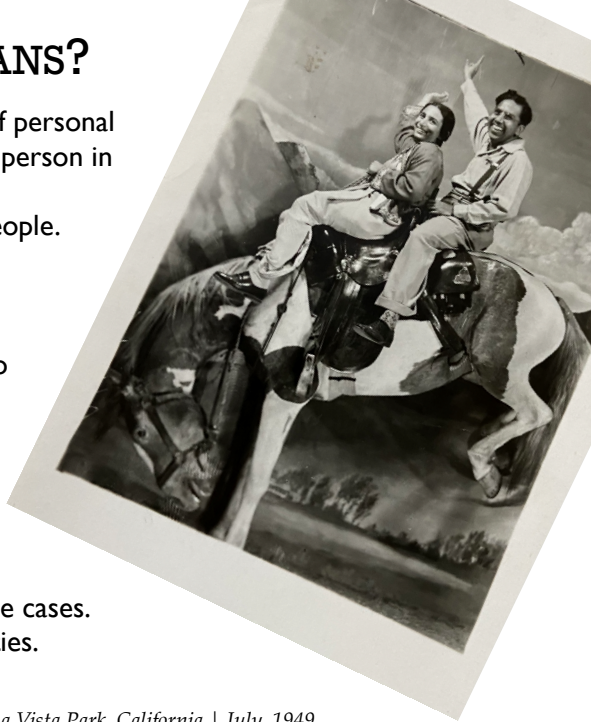
COWBOYS OR INDIANS?

My interest in this topic is borne of personal experience as a racially ambiguous person in the United States, whose identity descriptors have often confused people.

Myself included.

What does it mean to be Indian? To be from the West? What does it mean to be both and neither?

I have found that while ambiguity can be alienating, it can also create openings. To eliminate ambiguity may reduce harm in some cases. In others, it, might reduce possibilities.



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CONSTITUTIVE AMBIGUITY

“The Cervantes text and the Menard text are verbally identical, but the second is almost infinitely richer. (More *ambiguous*, his detractors will say—but ambiguity is richness.)” Jorge Borges

“Though incomplete I was working in these statements to identify marginality as much more than a site of deprivation, in fact I was saying just the opposite: that it is also the site of radical possibility, a space of resistance.” bell hooks

*to disambiguate
constitutive ambiguity is
to misrepresent it.*

Sometimes
ambiguity is the
salient
characteristic.

ambiguity can be an affordance.

“...maybe experiencing the world as less worded, as gesture, vivid image, can be seen not as lack but as resource.” Lars Horn

ACTIVITY: SPOT THE SEMANTIC DIFFERENCE

nice | kind

information | data

dwelling | home

fuzzy | furry

contraption | gadget

funny | humorous

ambiguity | uncertainty

This one is good to play in the car with friends or kids. Pick a set of words that are often treated as synonyms and consider how they might differ.

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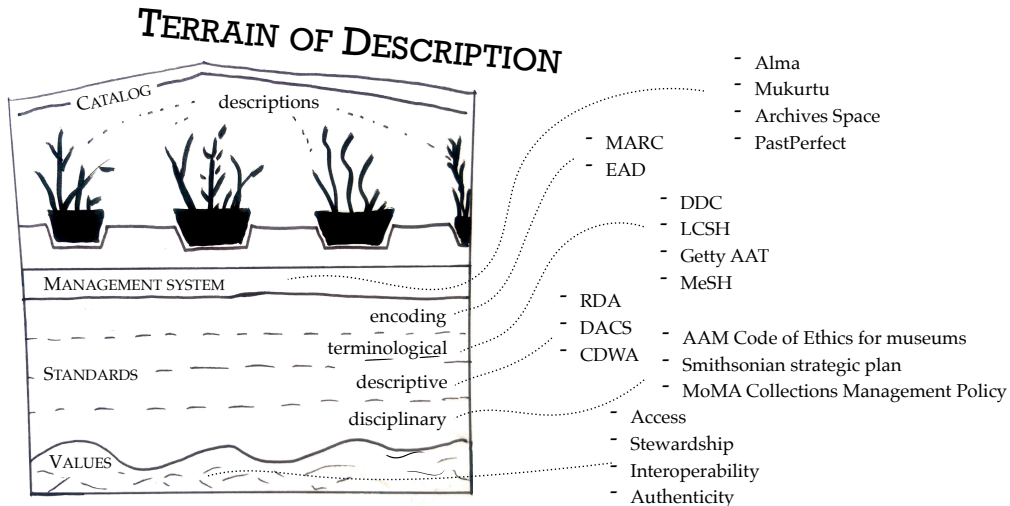
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SIMULTANEITY

___ Multiplicity

When an item has many relevant identities

___ Immensity

When an item is so big (like a dataset) that the viewer cannot fully grasp what is present

___ Hybridity

When an item fully integrates two or more identities to create a new form, genre or subject

UNCERTAINTY

___ Translational

When an item from another context cannot be fully understood due to issues of time, geography, language, etc.

___ Fragmentary

When an item is incomplete due to damage of some kind

___ Emergent

When an item is not yet adequately understood because it is of a type newly observed or created

RESIDUALITY

___ Temporal

When the description system cannot represent an item because its identity changes across time

___ Spatial

When the description system cannot represent an item because its identity changes depending on location

STRATEGY

___ Privacy

When an item does not follow rules of description to preserve privacy for item or creators

___ Passing

When an item does not follow rules of description to advocate for it to be understood in a particular way

___ Refusal

When an item does not follow rules of description as a form of protest against the system

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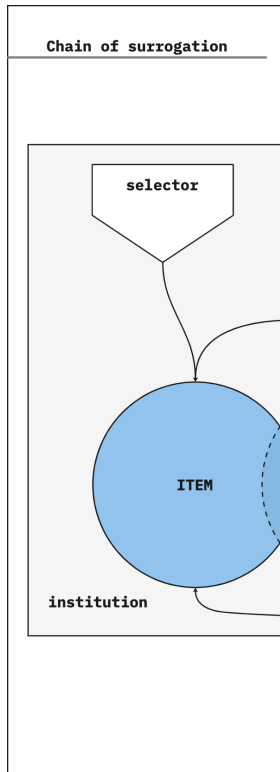
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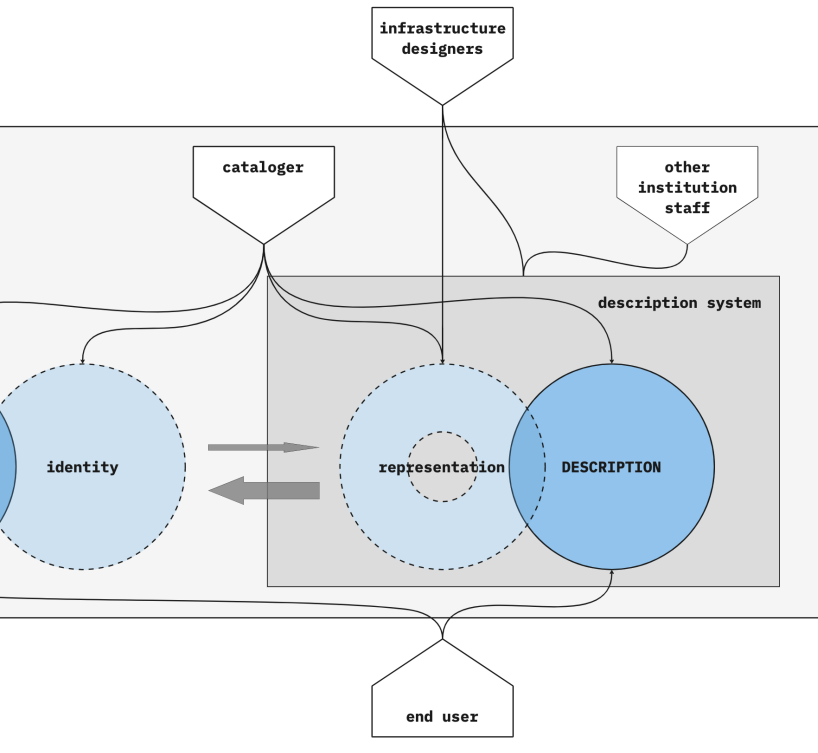
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ACTIVITY: DROP A PIN FOR FRICTION



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Finally, consider what resources this item needs or might desire. What kind of space does it need? Maintenance or care? Specialized labor, such as translation or historical contextualization?

Which of these resources are most easy to describe and advocate for? Which are most difficult to signal?

ACTIVITY: MAP A PATH NOT TAKEN

Think about the things you did in a short span of time, say four hours. For example,

- wake up
- drink coffee
- clean the sink
- feed the cat
- put gas in the car
- eat a snack

Now make a parallel list of things you could have plausibly done at each moment but did not do.

Finally, make a parallel list that is less plausible but still possible given the time and place you were in.

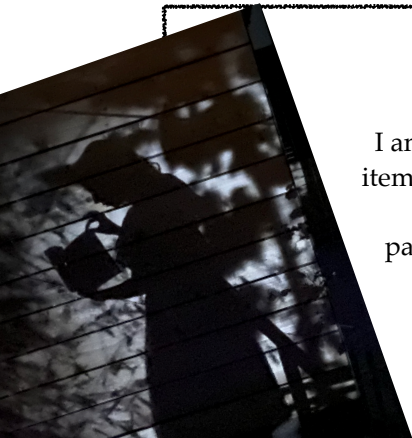
Make these three parallel lists visually interesting to you. It can be sloppy or precise.

Maybe you want to make each list in a different color, or make one blurry. There's no right way to do this.

This is not intended to be a reflection on how to make a better choice. Notice how actions sometimes flow from one another and sometimes are pretty haphazard. What we do and what we say about it suggests something was significant. Maybe it was. Maybe it was just the next step.

For this activity, you will need a camera, a printer, tracing paper, and scissors.

1. Cast an interesting shadow with your body and take a photo of it.
2. Print the photo and trace the shadow. (If you have a tablet, you might be able to trace the shadow directly on the screen.)
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I am inspired by this inventory of not-its, this catalog of close-but-not-quotes. If we wanted to acknowledge the impossibility of disambiguation in some cases, to honor constitutive ambiguity while still attempting to represent it, the Messier approach could serve as model. What might the ambiguous be mistaken for?

For this activity, you can return to the item you considered in the MAP CONSTRAINTS activity. Or you can pick another item. You could even pick yourself.



Put the item you are considering in front of you. This will be your *comet*, so to speak, the thing which other things are mistaken for.

Consider a variety of characteristics that might make it seem similar to other things. No need to stick to physical features. How does it move, sound, smell?

Create a list of at least 15 things that could be mistaken for your thing.

Don't be too literal. Imagine encountering from a distance, with gloves on, in another language.

To make this nice, draw a picture of each item. It can be blurry but should demonstrate how it could be mistaken for your item.

ACTIVITY: MAKE A MESSIER SET

Suggested listening: Prisencolinensinainciusol by Adriano Celentano

ADVOCATING FOR AMBIGUITY

I began this project wary of the ways that disambiguation can lead to misrepresentation of constitutive ambiguity. I imagined that describing these characteristics would require marking their resistance, allowing them to claim non-membership and allowing whatever opacity they presented. I recognized that such an approach runs contrary to the pragmatic ethos of the disciplines of description and is deeply inefficient.

While my concerns about the limits of disambiguation remain, I have become more convinced that viewing description as a form of advocacy might allow us to allow ambiguities their place while still ensuring they are represented in a manner that facilitates their membership along some lines, as recipients of resources.

These questions might be strange to ask in the context of the library, museum, or archive where identity is largely determined by inclusion in a collection, and where the backlog of un-described items can be seen as a massive latent ambiguity in the collection that far exceeds the ambiguity of any one item. Yet these sites allow us to imagine what it means to represent heterogeneous assortments of identities in a systematic manner, to inventory and manage what is present while imagining a range of future possibilities.

By recognizing that ambiguity is sometimes impossible to resolve in the logic of a system, and in turn to view ambiguity not only as fact, but as a feature or affordance, might help us to do better by that which we seek to represent.

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“Strategic ambiguity is not silence or evasion; it’s a choice to take on a certain amount of risk, to play with fire, to appropriate something that is used against you and make it work for you.” -Ralina Joseph

“We hold the objects in our hands, try to come up with the best words to describe them, think about where they fit with regard to similarities and differences from other objects in our collections, and then move on to categorizing the next set of objects. But without understanding these objects as expressions of Indigenous systems of knowledge, we risk mislabeling objects, reducing them to a mere characteristic description, separating them from other expressions needed for their use and interpretation, and evacuating them of their meaning.”
-Sandra Littletree, Miranda Belarde-Lewis and Marisa Duarte

“Representing material in a kaleidoscope fashion also affords ambiguity in a positive sense. Fracture and vignette allow sorting and resorting (or remixing). They can help resist ordinality, a given hierarchy of things.”
-Susan Leigh Star and Geoffrey Bowker