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The Effects of Human/Object Interaction on Museum Visit Experience Satisfaction

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THE EFFECTS OF HUMAN/OBJECT INTERACTION ON MUSEUM VISIT EXPERIENCE SATISFACTION

A Thesis
Presented to
the Graduate School of
Clemson University

In Partial Fulfillment
of the Requirements for the Degree
Masters of Science
Parks, Recreation and Tourism Management

by
John Richard Fino
May 2008

Accepted by:
Dr. Kenneth Backman, Committee Chair
Dr. Robert B. Powell
Dr. Melissa Vogel
ABSTRACT

Interactive exhibits in museums have become commonplace (Spock, 2004). They have been found to be effective teaching tools (Falk & Dierking, 1992), they can increase the attracting power of the exhibit (Davidson, Heald & Hein, 1991) and can help create mindfulness in visitors (Moscardo, 1996). However, interactives are considered primarily the domain of science and technology museums (Pekarik, 2004) and there is little published research regarding interactives in living history museums. To better understand the effects of interactives in a living history setting, a quasi-experiment was created to compare the outcomes of two treatments of the same interpretive presentation: an interactive treatment and a spoken treatment. The outcomes of this experiment were measured with a museum visit experience satisfaction scale adapted from Pekarik, Doering & Karns (1999), and illuminate the benefits and issues surrounding interactive interpretation.

To conceptualize the process of interaction and how it affects living history museum experience, this thesis employs Actor-Network Theory (ANT). ANT considers interaction between heterogeneous actors as the basis for the creation of experience (Latour, 2005). The process of creating this interpretive presentation, and the experience that arose from it, are analyzed as interactions of actors in an actor-network. It is concluded that museum visit experience in living history museums can be considered as an effect of the interactions between visitors, interpreters, museums objects and other non-human actors. The resulting experience is not a copy of the past but a new experience unto itself.

The adapted museum visit experience satisfaction scale emerged from the analysis with different (though robust) dimensions from the original Pekarik, et al article. This
difference may have several causes, including differences in museum visit experience between museums. This indicates that scales created for use in one museum may not be transferable to another, even though both museums may house similar artifacts and address similar issues.

This modified scale was used to test the differences between experimental treatments, but it was found that the interactive treatment had no significant effect on either dimension. As this differs markedly from the existing literature, it may be the scale itself is inappropriate for use here because of significant differences in experience between museums, differences in visitor demographics and experience, and between overall visit experience and exhibit experience.
DEDICATION

For Kristina and Sasha.
This thesis would not have been possible without the patience, assistance and wisdom of Dr. Bob Powell and Dr. Melissa Vogel. I would especially like to thank Dr. Ken Backman for his guidance when I needed it, his help finding funding (I always needed it), his encouragement even when I changed directions 180 degrees, and his willingness to let me follow my dreams and learn from my own mistakes.

Thank you to my mother and father who have been there for me from the days when I wanted to be an astronaut, to the days I was actually an archaeologist. They told me I could be and accomplish anything I wanted to, and meant it.

Thank you to the good folks at the Gibbs Museum and the Ramsey County Historical Society especially Priscilla Farnham, Ted Lau, Kristy Van Hoven and Paul Red Elk. They made the presentation and data collection possible, enjoyable and a success.

Thank you to the National Association for Interpretation for seeing something unique in this research and helping to fund a poor grad student.

Finally, thank you Kristina for more things than I will ever have space to list. If we truly are effects of our interactions with others, then, literally and figuratively, I am who I am because of you. I couldn’t be luckier or happier.
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DEFINITIONS OF SELECTED TERMS

**Quasi-experiment**: In this case an experiment without a control group in which two groups are compared against each other.

Actor-Network Theory terms:

**Actor-Network Theory (ANT)**: A sociological ‘theory’ that attempts to explain events and actors in reality as effects of interactions between heterogeneous actors.

**Heterogeneity**: ANT actors are heterogeneous, they can potentially be anything: people, objects, technology, plants, animals, texts, diseases, weather, etc.

**Performance**: In ANT, reality is performed into existence by the associations and negotiations between actors.

**Punctualization/Rituals/Network Consolidation**: Whereby an actor-network, made of many associated actors, is sufficiently stabilized to be recognized as a single actor.

**Actant**: An actor-network that functions together, but not so coherently as to be considered an actor.

Museum and Interpretation terms:

**Interpretation**: The research, synthesis and presentation of information pertaining a specific topic, so as to make the topic understandable and engaging to the general public. Also a field of professionals including guides, docents, interpreters, volunteers and museum staff.

**Personal Interpretation**: interpretation that is conducted by a live person.

**Third-person Interpretation**: where interpreters in period outfits conduct personal interpretation but do not portray period-specific characters.

**First-person Interpretation**: where interpreters in period outfits conduct personal interpretation as real or imagined characters from specific historic time periods.

**Interactivity**: a sensory engagement between someone and something else.

**Interactive exhibit or presentation**: museum exhibits or presentations that involve sensory interaction, especially physical and tactile, between visitors and museum objects.
**Exhibit**: a discrete interpretive section or area of a museum that presents a theme or topic to visitors as part of the overall museum interpretive scheme.

**Presentation**: an interpretation program given by a live person in a bounded space in a museum that presents a theme or topic to visitors as part of the overall museum interpretive scheme.

**Guided tour**: a personal interpretation program that can cover may distinct interpretive and spatial aspects of a museum.

**Living history museum**: a museum that interprets past events, histories and societies using original and reproduction artifacts in an authentically re-created setting. Interpretation in living history museums is done through personal interpretation, by interpreters in period outfits. The museum itself may be or contain a historic site.

**Historic museum**: a museum that interprets past events, histories and societies through original and reproduction structures and artifacts, sometimes in an authentically recreated setting. Usually the museum will contain a historic site.

**Historic site**: the architectural and/or archaeological remains of a historic structure or set of structures and the related original artifacts.
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CHAPTER ONE
INTRODUCTION

This research was conducted to better understand the effect that interactions between humans (visitors and interpreters) and objects (artifacts, art, living specimens) have on museum visit experience. To develop a research plan, three main research questions were asked. Does visitor interaction with interpretive museum objects increase visit experience satisfaction? Is a scale that measures visit experience satisfaction in one museum setting applicable and transferable to another type of museum? What can visitors tell us about how they understand, empathize with, and learn about other cultures in a museum setting?

The ontological basis for considering these questions is found in Actor-Network Theory (ANT). ANT views all reality as an effect of the interactions between heterogeneous actors, which includes humans, objects, animals, plants, texts, organizations and many others. If this is the case, then the museum interpretation of that reality, as an effect of interactions, should accurately reflect the interactions of the relevant actors in their actor-networks.

Interpretation is the act of taking large amounts of information relevant to a particular subject or topic and presenting it in a way that makes it understandable and interesting to the general public (Tilden, 1957). When museums take objects in their collections and present them on display for the general public, they are interpreting those objects. Just the fact of presenting them as important subjects, organized in a certain way, in relation to other objects, even without labels, museums are giving the visitor information about the object (Gielen, 2004). Most museums want visitors to gain new knowledge and so
provide written or spoken information (interpretation) about the objects. All museums use interaction between objects and people as a means of interpretation. For example, most museums encourage visitors to read labels that describe the object, and so create a visual and cognitive interaction between the visitor and the label, and between the visitor and the object. Many museums offer live demonstrations and presentations. During live demonstrations and presentations, it is normally only museum staff that physically interacts with the objects; the visitors watch and listen. Other museums encourage visitors to directly interact with specially designed interpretive exhibits and objects to enhance the visitor experience.

This thesis is concerned with these last two types of interactive interpretation, specifically in living history museums. Living history museums reconstruct aspects of past lives and environments (actor-networks) using original or reproduction artifacts that are relevant to the people and time period in question. This research focuses on the use of interactive presentations that encourage visitors to physically interact with objects during the presentation. This kind of interaction enhances visitor understanding of life during the time period interpreted through human interaction with relevant objects.

To answer the three research questions presented above, a quasi-experiment was created, and a scale was adapted to measure the outcomes. The experiment measured the differences between two treatments (or versions) of the same interpretive presentation: a spoken-only treatment; and an interactive treatment that involved visitors. The only difference between the treatments is as follows: in the interactive treatment, visitors and the interpreter physically interacted with the objects on display; in the spoken-only, they did not. The outcomes of the treatments were then measured on an adapted museum visit experience
satisfaction scale. In addition to this, four open-ended questions were included in the questionnaire to allow visitors to describe their experience understanding the culture and people that were interpreted for them.

Chapters Three through Six of this thesis describe in detail the process of creating the interpretive presentation, the quasi-experiment, and the questionnaire. Each chapter is written as a self-contained aspect of the research, and is intended to be pulled out for later publication. However, the chapters are organized in such a way to ensure the readability and understandability of this thesis as a single work.

Chapters Three through Six each deal with some aspect of the research questions identified above. Chapter Three answers the question: “What can visitors tell us about how they understand, empathize with, and learn about other cultures in a museum setting?” Chapter Three goes into great depth about the creation and implementation of the interpretive presentation, and relies on Actor-Network Theory as an ontological, epistemological, and methodological guide. This information, combined with visitor responses to open-ended questions, demonstrates that the process of living history interpretation creates new experiences; it does not merely replicate old ones.

Chapter Four deals with the application of the museum visit experience satisfaction scale. In the statistical analysis conducted for this research, the scale’s 14 items factored into two new dimensions of visit experience, different from the four dimensions identified in the original article (Pekarik, Doering & Karns, 1999). The details of the statistical analysis lead to the conclusion that, even though museums may house similar objects, the experiences in them may be quite dissimilar. This difference suggests the need for a typology of museum
types by visit experience. For this reason, scales developed to measure visit experience satisfaction in one museum may not be applicable in another.

Chapter Five looks at how the quasi-experiment was measured in light of the change in the scale dimensions. It is found that the interactive treatment does have a statistically significant positive effect on a few of the individual items, but no significant effect on the two new dimensions into which the 14 items factored. Neither do the treatments have an effect on reported overall satisfaction or likelihood to return. The possible reasons for this relative failure are in part the scale itself, in part how the scale was used, and potentially because the treatments may not have been different enough. It is also possible that, relative to the spoken version, interactive presentations do not have a significant effect on visit experience satisfaction.

Chapter Six briefly discusses the observations and insights gleaned from conducting spoken-only and interactive versions of a presentation four times a day, for thirty days. What was learned is presented as two main lessons: how to get visitors to participate in interactive presentations; and what effects each treatment had on the presenter himself.

Finally, a conclusion synthesizes the information and conclusions of the various chapters.
CHAPTER TWO
REVIEW OF RELEVANT LITERATURE

Introduction

This thesis draws on research from what appear to be somewhat disparate fields, specifically Actor-Network Theory, Interpretation and Museum Studies. However, they all have in common a concern for understanding and representing the relationships between humans and non-humans.

In this thesis, Actor-Network Theory sets the theoretical groundwork for how cultures and societies come together, how the representation of them is successful or not, and how interaction between humans and non-humans plays a crucial role in who we are and how we perceive others. Interpretation and museum studies are the fields in which this thesis research has been conducted, and both these fields use interaction to explore aspects of human existence, especially in cultural heritage and living history museums.

The following literature review addresses major issues in these fields that pertain directly to this thesis, as well as where research in these fields overlaps and complements.

Actor-Network Theory (ANT)

In the ontology of Actor-Network Theory (ANT), societies and cultures are created, maintained and changed through the interactions not only between humans, but between humans and non-humans such as texts, technology, semiotics, animals, plants and more (Callon, 1986; Latour, 2005; Law, 1986; Law, 1992). This view of reality provides this thesis with a theoretical reasoning for testing interactivity in cultural museum interpretive settings.
If societies and cultures are effects of interactions of heterogeneous actors, the interpretation of that culture for visitors should include re-creations of those interactions and include visitors.

The following is a brief history of Actor-Network Theory, the basics of how it works, and some selected ANT texts, including two that deal with museums. However, to my knowledge this is the first time ANT has been used in relation to creating interpretative programs and exhibits in living history museums.

*The History of Actor-Network Theory*

Though Actor-Network Theory finds philosophical roots in the writings of Foucault (Hull, 1999; Latour, 2005) in practice it began to take form in the field of Science, Technology and Society (STS) (Law, 1992). Beginning in the mid 1980's Bruno Latour, Michel Callon (both STS researchers) and John Law (a British sociologist) were interested in resolving the basic philosophical problem behind the so-called Science Wars (Latour, 2005) of the 1980’s and 1990’s. This problem, as Latour (2005) writes, has on one side sociologists, social constructivists and interpretivists who claim that reality is socially constructed, including facts generated by the ‘hard sciences.’ There was a strong backlash from natural science researchers who felt that there are many natural facts which are not products of human society, but exist without human intervention.

What Actor-Network Theory wanted to accomplish, instead of making all reality an invention of society (and sociology), was to look at how reality is an effect of interactions between what is considered social, technical and natural. The first step in this process was to expand the definition of what could be considered a sociological actor to include non-
humans (Latour, 2005). ANT posits that there is something social about non-humans that
could not be handled by the sociology of the time. In traditional sociology, “much like sex
during the Victorian period, objects are nowhere to be said and everywhere to be felt” (2005,
p. 73).

ANT’s solution is to re-write the rules of sociology (Latour, 1986). Instead of reality
as a creation of human thought, and objects as empty vessels to be filled with human
symbolism, human behavior and existence are permitted by non-humans (Latour, 2005). This
is, “neither simple technological determinism nor social constructivism” (Akrich, 1992, p.
206). ANT is less concerned with theoretical models, and more interested in the,
“procedures which render actors able to negotiate their ways” (Latour, 1999, p. 20). This
brings a very literal and empirical stance to the study of what and who acts to create reality.

ANT has several landmark works that constitute the first sociological uses of the
theory (Latour, 2005). They are, “Unscrewing the Big Leviathan,” by Callon and Latour
Domestication of the scallops and the fishermen at St. Brieuc Bay,” by Callon, and, “The
Pasteurization of France,” by Latour (1988). The development of ANT as it is today was a
long process that was influenced by many other researchers, and has undergone such
changes to make Law wonder if it is indeed even the same thing today as it was then (Law,
1999a).

ANT is sometimes not even considered to be a sociological theory (Callon, 1999),
per se, because it has not only its own ontology (Cordell & Shaikh, 2006), but its
epistemology is created at the same time as its ontology (Law & Singleton, 2003). Other researchers have eschewed using the ontology and epistemology of ANT and simply prefer its utility as a methodological tool (Cordell & Shaikh, 2006). As well, ANT is less interested in creating or discovering general rules that govern actions; it is more concerned with how certain situations arise because of interactions between actors, and how some actor-networks are successful and others are not (Callon & Law, 1982).

It can be difficult to pin down exactly what ANT is and is not (Law, 1999a), in part because of how it came about, but also because of changes in academic and popular environments since its inception. Bruno Latour (1999) at one point wanted to abandon the term Actor-Network Theory entirely, noting that, with the advent of computers and the internet, the term network was no longer understood in the same way as it was intended. As well, the term actor does not completely encompass what an actor in ANT is meant to stand for, and ANT is not really a theory in a classically socio-scientific way. Even the hyphen seems to confuse more than help. However, Latour decided that the ANT moniker had stuck, and that an ant (ANT, as opposed to Actor-Network Theory) might be an appropriate metaphor for what ANT researchers are trying to do: investigate mundane everyday events, tirelessly, exhaustively and very literally without using invisible powers and forces to explain the events in question (Latour, 2005). And, after all, the more accurate title of actant-rhizome ontology may not have proved any less confusing (Latour, 1999).

Actor-Network Theory Basics

This thesis mainly looks to ANT as an ontological/epistemological guide to understanding the continuous, emergent nature of culture. For this reason this literature
review concerns itself primarily with the bigger picture of ANT and less regarding the
details of how ANT studies are conducted. First, we will look at what is an actor-network,
and then give some general principles that been have developed around the concept of
actor-networks. Finally, we will examine a set of relevant actor-network studies.

What is an actor-network?

An actor-network does not function in the way networks such as the internet work,
based on nodes and line-like connections between the nodes (Latour, 1996). An actor-
network is not so easy to define as that. Nor does the study of actor-networks have much in
common with the study of social networks (1996). Instead, an actor-network is, in part, a
creation of the researcher. It is a, “tool to help describe something, not what is being
described. [. . . .] a concept, not a thing out there” (Latour, 2005, p. 131). In fact, Latour
(1996) emphasizes the strong reflexive aspect of ANT, where the researcher is part of the
actor-network and the tracing of actor-networks. “A network is not a thing, but the
recorded movements of a thing” (p. 378). It is beholden to the researcher not to look
beyond literal, physical, everyday events to explain the actions involved in an actor-network
(Latour, 2005). There is no invisible force to draw answers from; if the researcher wants to
find hidden reasons for action, the researcher must continue to dig deeply into the
associations and movements that created the action. (Latour, 1996).

Heterogeneity. Any actor-network is the traced associations and interactions of
many heterogeneous actors (Law, 1992). Heterogeneous here denotes actors that are not only
humans but any relevant type of actor, be it animal, vegetable, mineral, technology or text
(1992). To create an actor-network the connections between actors must be physically
traceable and empirically recordable, and involve effort on the part of the relevant actors (Latour, 2005). These actors, however, are not perfectly discreet entities, but themselves products or results of the interactions of other actors and can therefore be regarded as actor-networks themselves (Law, 1999a). It is, for the most part, the researcher who must decide how far and how many connections to trace in the actor-network in question; otherwise the study would go on forever. The researcher must constrain himself to the most relevant connections of the network to prevent the study from becoming unwieldy (Hitchings, 2003).

**Performance.** Another important ANT concept is that of performance. Law and Singleton (2003) note that the network itself is a performance. Since no relationship between actors is eternal or perfectly stable, the process of creating a network and holding it together is a task performed between many heterogeneous actors. Law (1992) notes that, “almost all of our actions with other people are mediated through objects” (p. 3) of some kind. As the arrangement and existence of those objects change within the network, so too will the network change. For example, human organs can be seen as part of the actor-network that creates the human body. If the liver fails, the connections between the other parts of the system begin to fail, and we may attempt to substitute non-organic (mechanical) actors to fill the role of the liver so that the actor-network of the body can continue to function in a certain way. However, the substitution is rarely equivalent to the original and the network may need to be altered or enlarged (with the inclusion of dialysis or a liver transplant). However, the cause of the liver failure is part of what is creating the current state of the body actor-network. If the cause (alcoholism, cancer) continues to affect the
network in the same way, the system will continue to fail. The functioning state of any human body is not just an interaction of organs, but the interaction between organs, diseases, social conditions, technology and more. The actor-network performance is not restricted to internal actors, but must include external actors, as well. In fact, what is internal and external, micro- and macro-, subject and object must not be predefined for any ANT study because the terms are hardly ever as clear as they at first seem to be (Latour, 1999).

**Power.** Power is also a central subject in ANT (Bennett, 2002; Brown & Capdevila, 1999; Callon, 1986; Latour, 1986; Law, 1992). Callon and Law (1981) defined ‘actor’, in part, by the ability of one thing to exert power over another thing. “What is an ‘actor’? Any element which bends space around itself, makes other elements dependent upon itself and translates their will into a language of its own” (p. 285). In part, power stems from the relationships that an actor can make. “A network is never bigger than another one, it is simply longer or more intensely connected” (Latour, 1996, p. 371). An actor attempts to generate power, and thereby its own stability, by enrolling other actors into its network and getting them to go along with its interests (Callon & Law, 1982). This is not as Machiavellian as it seems; often the strongest networks are held together because the associations are mutually beneficial. Again, the real functioning of any actor-network should not be assumed beforehand.

**Punctualization.** Vast connections become unwieldy as power grows, and actor-networks need a method to deal easily with all these connections and ensure stability. Four terms have been used in ANT works to define this method: black-boxing (Callon & Latour, 1981), punctualization (Law, 1992), rituals (Verren, 1999) and network consolidation (Law,
1999). Instead of dealing with the myriad connections of networks upon networks, we black-box actor-networks; we punctualize complicated associations so that we only have to deal with one named thing. This is exactly what pundits do when they say that “Google” created a new piece of software, or “ExxonMobil” earned record profits, or “Hollywood” made a movie. We can more easily deal with multiple actors and actor-networks if we simplify our relationships with complicated actor-networks. Similar to this concept, Verren (1999) talks about rituals. Rituals, “hid[e] what is too big too consider routinely” (p 149), to make everyday life easier to deal with. To avoid the idea that actors can only solidify in the minds of the beholders, the concept of network consolidation refers to an actor-network which is powerful enough, and well-defined enough to be seen by others as a single actor (Law, 1992). Latour frames this as the movement from something vaguely defined (an actant) to something well-defined (an actor) (Latour, 1996).

**Rhythm and reliability.** Brown and Capdevila (1999) have created one elegant solution to resolve the question of how actor-networks form to begin with: through repetition, or rhythm. “Repetition is what holds together networks” (p. 36). When an event or action or association occurs repeatedly and reliably, it creates stability off of which other things can build their own actor-networks. The networks can then become self-reinforcing, because the actors that have attached to this network have become invested in the stability, the rhythm, of the original repetition. They want to make sure that the rhythm, the predictability, is maintained. However, other actor-networks function off different patterns of repetition and may compete with each other for power (connections and associations)
and try to draw away actors from other networks, increasing their power, and decreasing that of others.

**Sociology of Translation.** In 1986 Michel Callon published a monograph in which he outlined his ideas to create a language and framework for dealing equally with all actors involved in a sociological study: a sociology of translation. He examined a case of scientists attempting to restock a French bay by seeding it with scallop larvae. His analysis synthesized the natural (the scallops, the bay), the social (the fishermen), and the scientific/technical (the scientists) to create a picture of how the success (or failure, in this case) of such a project depended on many kinds of actors.

The concept of a sociology of translation (Callon, 1986) was rarely used in the same way after this initial study, but it does point us to several very important concepts that would be used later in ANT. The following three principles of the sociology of translation also underlie ANT: agnosticism (treating all actors in a study impartially), “generalized symmetry (the commitment to explain conflicting viewpoints in the same terms) and free association (the abandonment of all *a priori* distinctions between the natural and social)” (p. 196).

In addition, Callon (1986) outlined several non-linear stages in the process of translation: problematization (where actors attempt to become indispensable by setting themselves up as Obligatory Passage Points, through which a successful conclusion can be reached); interessment (where actors get others to play the roles appointed to them); enrolment (getting the actors to work together toward the common goal); and mobilization
These concepts have come to help ANT studies describe how power relationships develop.

**Non-Euclidean topography.** Just as power is, “not something you can possess or hoard” (Latour, 1986, p. 265), but an effect of associations and interactions (1986), neither can distance or size be assumed to be linear in an actor-network. In ANT, the distinctions between what is micro-scale and what is macro-scale begin to break down. All action is local, and connections and power come not from invisible hands and forces, but from everyday interactions that can be empirically recorded (Latour, 1996).

Law (1986) explains how the Portuguese managed to control the spice trade in the 15th and 16th centuries by examining how they maintained long-distance control of their ships. The use of objects inscribed with scientific knowledge (the astrolabe), rigorous training (integration of social structure with the ship itself), and technological advances in ship design (stability in deep, rough waters) led to the key elements of this control: mobility; durability; predictability; reliability; compliance; and fidelity (of communication). The ships, the crew structure and training, and the technical instruments had to work together properly to create the conditions under which a ship could be launched from Portugal and return with a cargo safely, in a relatively predictable manner.

The power to become a “global” power stems entirely from “small” interactions that are observable and recordable. “Instead of having to choose between the local and the global view, the notion of network allows us to think of a global entity – a highly connected one – which nevertheless remains continuously local” (Latour, 1996, p. 372). ANT, however, does not discount the idea of scale; it forces us to question whether what seems to be a
purely local phenomenon is truly local. An actor-network can succeed because it mobilizes the efforts of other actors and actants that spatially may be quite distant (Callon, 2004). Through the tracing of associations things that may be spatially or temporally distant may turn out to be very close to each other in an actor-network (Murdoch, 1998) and vice-versa.

**Agency.** ANT, “does not celebrate a difference between people [and] objects. It denies that people are necessarily special” (Law, 1992, p. 4). ANT is an attempt to level the playing field of sociological thought to make room for analyses to include non-humans. However, this is an, “analytical stance, not an ethical position” (p. 4). ANT does not deny that people have rights responsibilities or ethics. It simply does not want to define *a priori* what those ethics are, how they must be applied, how they came in to existence and how they continue to be used. In ANT it is relationships and associations which grant agency, because things that are completely self-sufficient have nothing to act upon, and there for cannot act (Cordell & Shaikh, 2006). Agency, like power, is an effect of interactions between actors.

*ANT Research*

The following are examples of ANT that illustrate some of the preceding points as well as find new insights into Actor-Network Theory.

**M. Akrich, 1992. The De-scription of technical objects.** Technical objects have agency in ANT, and so objects are participants in the creation of networks that connect human and non-human actors. Akrich emphasizes that this is, “neither simple technological determinism nor social constructivism” (p. 206), but rather a complex set of mechanisms and interactions. Akrich asks, what is the best way to describe those roles and interactions?
She suggests that instances of interaction are most likely laid bare where there is disagreement and controversy. Here one can see, “the elementary mechanisms of adjustment between the technical object and its environment” (p. 207). These adjustments (negotiations between objects and environment) expose the difference between how objects were designed to be used (inscribed), and how they actually end up interacting with actor-networks.

**J. Murdoch, 2001. Ecologising sociology: Actor-Network Theory, co-construction and the problem of human exemptionalism.** A basic ANT tenet aims to reduce the distinction between what is natural and what is social, and Murdoch notes that the ecological movement also is attempting to do something similar. He states that the continuing dualism is potentially damaging to the earth’s ecosystem (of which people are a part) and that traditional sociology is doing harm by continuing to draw a fine line between natural and social. Even environmental sociology comes at what is natural and what is social from an anthropocentric point of view. ANT, he suggests, is a strong alternative, “an example of an ecological theory, […] that stresses how social and natural entities come into being as a result of the complex relations (or networks) that link them together” (p. 114). As always with ANT, he does not want to imply that humans are necessarily the same as “nature,” but instead that the distinction should not be an a priori one, but one uncovered in the tracing of actor-networks.

**J. Law and V. Singleton, 2005. Object lessons.** In studying the treatment of liver disease in a UK hospital, Law and Singleton are stymied by the complexity and messiness of the disease. They found they were ill-prepared for the difficulty in pinning down what
exactly is liver disease. It has different symptoms, different diagnoses, different treatments, different meanings to different people (doctors, patients, nurses) in different contexts. The concept of a fluid object (de Laet and Mol, 2000) was already well-known in actor-network practices, but Law and Singleton decided they needed a new term for what this was: a fire object. Liver disease does not flow gently like a fluid object. Liver disease changes abruptly. “Alcoholic liver disease becomes an object that jumps, creatively, destructively and more or less unpredictably, from location to location” (p. 347). In the hospital it requires that the patient must stop drinking, in the substance abuse center it requires control and regulation, and for general practitioners, between alcohol and hard drugs, this is the lesser of two evils.

**P. Gielen, 2004.** *Museumchronotopics.* Museums are responsible for creating interpretation for the public, but when it comes time to study the outcomes, visitor studies focus too much on the social demographics and background of visitors, and not enough on the relationship between the museum historians, presentations and the visitor. In museums, “How the past is ‘staged’ [...] has an influence on those to whom it appeals” (p. 147). This too affects museum exhibit outcomes. By presenting something as centrally important, museum professionals make that topic important for the visitor. Visit experience and learning is not entirely visitor choice. Museums, as they exist, are interactions between visitors, objects, the interpretive process, historical texts and many other heterogeneous museum actors.

**K. Hetherington, 1999.** *From Blindness to blindness: museums, heterogeneity and the subject.* In this book chapter, Hetherington explores the issue of seeing, subjectivity, and heterogeneity in museums over time. Museums, for many centuries, were collections and displays of many kinds of objects and materials presented in close
proximity. However, museums have become spaces of strict ordering, where spaces and objects are homogenized to make some aesthetic or historical sense for the viewer.

Museums have become reflections of the modern search for order in all things. He also notes that the idea of heterogeneity is shifting, and that the future of museums may need to extend beyond the realm of seeing, to where the difference between subject (the viewer) and object is less obvious. He suggests that involving the sense of touch will help overcome the strict subject/object relationship of museum spaces.

Summary

Actor-network studies are about tracing connections to tell a story of the ways humans interact with non-humans and their environment (Law, 1992). The story may not be linear, nor teleological, but it describes how a situation comes to be arranged in a certain way (Latour, 1996). As will be seen below, this is a very similar definition to that of interpretation, especially cultural and historical interpretation. Living-history style museums, with their focus on situational recreation, are in a prime position to take advantage of this theoretical grounding.

Next this literature review will cover some basics of what is interpretation, then progress into the area of museum studies. There we will look at some basic background of museum studies, then more specifically at learning in museums, the museum experience and finally interactivity in museum settings.
Interpretation

To discuss interpretation, we begin with Freeman Tilden and his book, *Interpreting Our Heritage* (1957). It was his intention to, “make history more intelligible to the man on the street” (p. ix). He gives a rather dry, official definition of interpretation: “An educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information” (p. 8). Shortly thereafter, however, comes his true insight into the nature of interpretation: “The story had been interpreted for me; seemingly unrelated facts had been reasoned into a whole picture that solved all difficulties” (p. 8).

Tilden describes six principles of interpretation. His first principle warns that any interpretation, to which the audience cannot personally relate, cannot draw connections to, will be uninteresting and sterile. Second, “interpretation is revelation based upon information” (p. 9), but interpretation is not merely the regurgitation nor rote learning of facts. Third, interpretation can be taught; it is not necessarily an inherent ability. This is because interpretation is an art form, even if it is relating the instances of hard scientific facts. Fourth, “the chief aim of interpretation is not instruction, but provocation” (p. 9). The interpreter provokes the audience to think deeply about the subject, to re-order the ways visitors envision the subject in question. Closely related to his definition of interpretation, number five instructs the interpreter to regard and address the subject as a whole, and to do the same while addressing the audience. Finally, interpretation for adults should not simply be dumbed-down for children, but must be taught in a manner appropriate for the age group in question. Tilden charges the interpreter with the task of creating and illuminating
relationships between not only actors in the particular presentation, but between the interpretive subject and the audience, between the interpreter and the subject, and between the interpreter and the audience.

The sweeping, sometimes romantic generalities of Tilden are broad enough to be useful for any kind of interpretation. However, Ham’s 1992, *Environmental Interpretation: A Practical Guide for People With Big Ideas and Small Budgets*, delves into depth, detail and structure that Tilden did not provide. Ham does not attempt to re-write what interpretation is. Interpretation, “involves translating the technical language of natural science or related field into terms and ideas that people who aren’t scientists can really understand. And it involves doing it in a way that’s entertaining and interesting” (p. 3). Instead, Ham provides extremely specific details on how to best do interpretation: “smile; use active verbs; show cause and effect; link science to human history; use visual metaphor to describe complex ideas; use a ‘vehicle’ to make your topic more interesting; exaggerate size (scaled metaphors); exaggerate time scale; use an overriding analogy; use a contrived situation; use personification; focus on an individual” (p. 10-11). He also introduces the idea of thematic interpretation. Each interpretive presentation should have a clear theme, which functions as the message regarding the presentation topic. The interpreter presents main ideas (and there should be five or fewer main ideas, so as not to lose your audience) as part of and relating to the overall theme. The theme is presented to the audience at the beginning and then again at the end of the interpretive presentation.

Beck and Cable (2002) created “fifteen guiding principles” for natural and cultural interpretation, which they consider to be expansions and offshoots of Tilden’s original six
principles. The first six of the fifteen are very similar to Tilden. Beck and Cable then note that interpreters have an important role in making a positive impact through the telling of the history of a place. Next, they talk of the utility of technology in interpretation, but also give a warning about its easy misuse. They also state that quality and brevity trumps quantity; knowledge of good communication skills is key; interpretive writers must be humble and careful and address the concerns of their audience; interpretation must be financially viable; interpretation can provide for spiritual well-being and resource preservation; optimal experiences can flow from good interpretation; and that passion must be found throughout the interpretive process.

Brochu and Merriman (2002) explore the usefulness and details involved in personal interpretation. Personal interpretation is interpretation conducted by a live person for a live audience, and has long been considered the most effective form of interpretation (see also Hwang, Lee & Chen, 2005). As we have seen, just knowing and being able to state facts does not make for good interpretation. “Interpreters must be social scientists as well, learning about the audience, the process of communication, and the perceptions people have of the resources being interpreted” (Brochu & Merriman, 2002, p. 14). The major benefit of personal interpretation over other forms of interpretation is the interpreter's ability to adapt the presentation or tour based on firsthand knowledge of the audience. A skilled interpreter will be able to adapt a presentation based on his knowledge of the subject, the interests of the visitor, and the requirements of the job. This adaptability leads to increased interaction between visitors and interpreters, and enhances the experience for the visitor. As the National Association for Interpretation puts it, interpretation is, “a
communication process that forges emotional and intellectual connections between the
interests of the audience and the inherent meanings in the resource” (p. 14).

However, not all interpretation is successful, in part because not all visitors are alike. Where many visitors actively seek out interpretive presentations or signs, many are ambivalent or even purposefully avoid interpretive materials (Stewart, Hayward, Devlin & Kerby, 1998). It is also risky to assume that interpretation of resources will lead to a change in visitor attitude: “studies have shown that even interpretive programs that produce large increases in visitors’ knowledge don’t often impact attitudes” (Ham, 2007, p. 4). The visitor brings all her preconceptions along with her, and the interpreter has a very short time to affect a change that may be then overwhelmed by other information, post-visit (2007). Ham (2007) suggests that what really creates change is how much an interpretive presentation or exhibit caused the visitor to think deeply about the subject, not just how much the visitor learned.

In this respect, instead of thinking only about how much the visitor learned, Moscardo (1999) looks to how well an interpretive experience was able to make a visitor “mindful”. She argues that the goals of interpretation (those discussed above) are aimed at making visitors more mindful. A mindful visitor is, “active, interested, questioning, and capable of reassessing the way they view the world” (p. 382). This mindfulness can be created by interpretive practices that encourage control, interaction, and activity, as well as introducing novelty, pique the visitors’ personal interests, and properly orient them to the interpretive subject. Moscardo notes that personal interpretation is very useful in facilitating mindfulness in visitors. Indications of mindfulness include increased visitor attention and
attracting power, increased visitor preference for tours that induce mindfulness, greater interest in the subjects presented, and higher rates of factual learning and recall.

Interactive interpretation attracts and holds visitors because the visitors have control over how much they will participate in the interpretation (Moscardo, 1999). Visitors should not just be passive absorbers of interpretation but must have some involvement, some say in what happens. This, combined with effective personal interpretation can create a strong, personal connection between the visitor and the subject at hand (Hwang, Lee & Chen, 2005).

Interpretation is a key element in any museum setting where the interpretation is focused on the collection of authentic objects, their display and interpretation. This next section will examine some basics of museum studies, and revisit some familiar interpretive ground, including learning in museums and the broader museum experience. Finally, the subject of interactivity in museums will be examined in detail.

**Museum Studies**

Interpretation is everywhere in museums, from exhibit design to interactive web content, but the task of creating a specific experience for visitors must go beyond just interpretation to researching outcomes. This section will first cover a discussion of museum learning and the museum experience, then issues and controversies in museum studies, and finally take a close look at research into interactivity in museum settings.
Learning in Museums

For Falk and Dierking, two giants in the field of museum learning research, the term museum refers to, “art, history and natural history museums; zoos; arboretums; botanical gardens; science centers; historic homes” (1992, p. 1). Mainly what they have been interested in over the years is visitor learning in museums, which they defined as assimilation of, “events and observations in mental categories of personal significance and character, determined by events in their lives before and after the museum visit” (1992, p. 123). Learning in museums, therefore, is tied not only to what visitors experience in the museums but relies on past and future visitor experience.

Falk and Dierking (2000) prefer to use the term “free-choice learning” as opposed to “informal learning” in museums, and state that much of what people know and understand about the world around them comes from this kind of free-choice learning (though not necessarily only from museums). Museum learning is not like school learning, it is not a, “transmission-absorption” (p. 9), model, it is, “simultaneously a process and a product, a verb and a noun” (p. 9). Since it is free-choice, visitors exert an extensive amount of control over what they learn and how (2000).

In their 2000 work, Learning from Museums, Falk and Dierking revamp their 1992 Interactive Experience Model (see Museum Experience, below) somewhat and re-label it the Contextual Model of Learning. It includes three overlapping contexts (personal, social and physical) with learning as the outcome of the interactions between the three. So then, learning is an effect of interactions between heterogeneous actors such as language, environment, and physical context (Falk, 2005). Rennie and Johnston (2004) would add time to this list. For this reason, even though it has been shown that people do learn from
museums (Falk, Moussouri & Coulson, 1998) museums cannot expect to determine learning outcomes, they can only influence them (Falk, 2005).

Visitors come to museums with their own agendas and motivations, which in turn affect learning (Falk, Moussouri, & Coulson, 1998). These visit reasons are as diverse as education, entertainment, social events (Falk, & Dierking, 2000), relaxation, enjoyment, spiritual fulfillment (Falk, 2005), vacations, family outing, visiting with someone else, brought others to see the museum (Prentice, Guerin, and McGugan, 1998), restoration, and social interaction (Packer and Ballantyne, 2002). This list is not exhaustive. The family is also an extremely important actor in museum learning. Falk and Dierking (1992) have noted that the potential educational benefit for children is one of the most important factors for adults when visiting a museum. They suggest that museums create and organize activities for families and groups instead of individuals because much of learning in museums turns out to be facilitated by the people around the visitor (Falk, & Dierking, 2000).

Prentice, Guerin, and McGugan (1998) hypothesize four processes that affect learning at heritage attractions: attentional (does the site attract and focus attention effectively?); affective (does the site allow visitors to enjoy themselves and create positive attitudes?); cognitive (do visitors absorb and retain information?); and compensatory (does the site make adjustments for differently-abled learners?). They find that the causes of learning are complex. Any one variable has little individual effect, and simple models that predict how individuals learn may not be able to capture the whole picture. This is something that others also have discovered (Falk & Dierking, 2000). As Falk puts it, “Theoretically, the total number of factors that directly and indirectly influence learning from museums number in the hundreds, if not thousands (2004, p 85),” and random events
have a greater influence than museum professionals and researchers might like. Falk (2004) also reiterates that, for this reason, it’s more likely that museums will strengthen what people already know, rather than changing their views outright.

Greenglass (1986) went about looking at learning in museums in a slightly different way. He compared learning for adult visitors of different information processing abilities between low-structure and high-structure learning environments. He found that visitors with lower information processing abilities performed better with higher structure environments, but did not find that low-structure settings were better for high-ability learners. He concludes that lower-ability learners are more sensitive to the kinds of museum learning structures than are high-ability learners.

Learning, however, cannot be separated from the visit experience itself. As Bitgood (2002) explains, learning is part of the visit experience and non-educational aspects of the experience can affect learning. For example, visitors must be properly oriented to the physical and interpretive lay out of the museum and be able to find their way from one space to another. Bitgood gives three principles of visitor interaction for ‘setting factors’ are the exhibitions/exhibits. First, visitor attention is discreet and selective, and distance and novelty affect whether visitors go to an exhibit. Second, there must be a strong motivation to focus on the exhibit once the visitor is there; if it is not interesting or there is something more interesting, they will wander off. Third, visitor attentions spans are affected by how much physical and mental effort they have to put in to following an exhibit. From these principles he gives a few suggestions: don’t overload visitors with labels or objects which will distract from the point of the exhibit; there should be an obvious connection or flow
from label to label and object to object in the exhibit; visitors must be able to comprehend the message; and visitor interaction with and response to exhibits should be appropriate to what the exhibit is designed to do.

Factual learning, alone, likely cannot encompass the all outcomes that a museum interpretation can expect and desire. Belland and Seals (1986) bring to bear the idea of concept learning, which goes beyond factual learning. Concept learning considers abstract concepts and classes of ideas that might not be easily identifiable and measurable in a few words on a questionnaire. “Learning that fire is hot is very different from learning the text of the Gettysburg address” (p. 86). Broad, less tangible concepts such as culture, “are built out of large hierarchical clusters of concrete concepts” (p. 86). To convey concepts, emotions, and sense of place, museum interpretation must think beyond the single exhibit, and consider more than just what information visitors process and retain.

Museum Experience

“It cannot be assumed that all visitors […] have actually come to learn something” (Packer & Ballantyne, 2002, p. 184). Visitors bring their own agendas to museums, and those personal agendas heavily influence what visitors choose to do and see. Beeho and Prentice (1995) also note that visitors are not necessarily coming to museums to learn, and that visitors want to have a variety of experiences available. “Visitor needs must be met by providing what will have been perceived to have been an enjoyable, enriching, satisfying and beneficial experience” (p. 231).

To try to better explain this experience, Falk and Dierking in 1992 published The Museum Experience. They put forward a theoretical model that attempts to convey how
visitor experiences end up the way they do. This model went by the name, ‘The Interactive Experience Model,’ though with their change in emphasis to learning outcomes, Falk and Dierking changed the name (see Museum Learning). The original model considered visitor experience as an outcome of interactions between three contexts: personal (visitor agenda, interests, motivations); social (who the visitors come with and who the visitors interact with); and physical (the objects, the structure, the spaces and the ‘feel’ of the place). The personal context has the greatest influence on visit experience, and the visitor agenda most strongly directs the personal context. Therefore, if museums want visitor experiences to be successful they must interact with the visitor in such a way as to influence that agenda. This interaction is a crucial role of interpretation.

Created at eight different Smithsonian Institution museums, Pekarik, Doering and Karns created a 14 item scale of satisfying experiences in museums, and factored from this four dimensions of museum visit experience satisfaction. These four dimensions are object experiences (e.g. “seeing the real thing” [p. 156]), cognitive experiences, introspective experiences (e.g. “imagining other times or places” [p. 158]), and social experiences. They developed this scale because they felt there wasn’t a, “comprehensive theoretical frame work of experiences in museums” (p. 153). In testing these four dimensions, they found that different dimensions were stronger in different museums, and differed by age, though they acknowledge the difficulty of separating out what outcomes are caused by the interpretation and what are caused by the visitor demographics and pre-visit agendas.

Another part of the visit experience is tied to the effectiveness of the individual exhibits. According to Shettel (2001) there is not enough research into understanding how visitor behavior in the exhibit area leads to exhibit efficacy and success. He suggests that
using “cued testing” is the most accurate picture of this interaction. In a cued study, the researcher asks the visitor to participate as fully as possible in the exhibit, and then answer questions about the experience immediately after. He means for this to control for the problem of visitors not fully participating in an exhibit as it is intended, and is best used when doing initial, pre-opening testing.

Doering (1999) looked at how museum priorities affect the visitor’s experience. When curation of artifacts and collections is the museum’s priority, visitors are treated as strangers. When education is foremost on the museum staffs’ minds, they see the visitor as a guest. When the museum feels that is it directly accountable to the visitor for a quality experience, visitors are clients. Doering favors the last option, calling on museums to focus on what the visitor wants, rather than what the museum staff wants. In this way, the museum can be seen as a service industry, rather than a storage facility.

Pekarik (2004) also notes that, “the gap between intentions of museum staff and the experiences of visitors seems striking and ever-present” (p. 145). Visitors bring their agendas with them and so manage to find or create the experience they were looking for. Visitors want control, they want the experience to be interactive, and Pekarik notes that interactivity is most often provided at science and technology museums. He sums up museum visit experience thus: “I am suggesting that the benefit that may matter most to museum-goers might not be a specific type of experience such as ‘learning’ or ‘understanding.’ It may instead be a state that is not accessible in words but that one recognizes as being positive, developmental, and somehow ‘museum-like.’ Visitors may sense the importance of […] museums as a partial reflection of what it feels like just to ‘be there,’ wrapped in a state of being” (p. 148).
Studying learning in museums would then appear to be simpler than studying experience. It is certainly not easy to define exactly what learning is, to figure out how to best encourage it, or how visitors are actually learning, but visit experience is even more nebulous and hard to define in words everyone can agree upon. Much like a fluid or a fire object, visitor experience is hard to pin down, yet is certainly there and needs to be explored more deeply as an important aspect of museum studies.

Representing cultures in museums

Many researchers now see the museum as a place for facilitating discussion on many topics, including difficult or controversial ones (Pekarik, 2004, Hancocks, 1987), and more than just a place for storing artifacts and teaching. This is especially the case in museums that deal with cultural interpretation: interpretation of a foreign or historic culture. Control in museums should not just be for visitors, say Lavine and Karp (1991). The people who are portrayed by museums should have a chance to influence the interpretation of their heritage.

After all, Vogel (1991) observes, “almost nothing displayed in museums was made to be seen in them” (p. 191). To be faithful to the objects in question, the non-native interpreter should not assume to know everything about the object or its use. Museums cannot perfectly re-create or represent the cultural context so that visitors will have an exact understanding of it in context (Vogel, 1991; Baxandall, 1991). Even the visitor’s perception and value judgements related to the objects and interpretation in question will inevitably be informed by their own cultural expectations (Baxandall, 1991).

Here again, there is the suggestion to allow the visitor the control over interpreting the subject or object instead of delivering ‘the answer’ to them (Baxandall, 1991; Heumann
Gurian, 1991). Museum professionals should assume that visitors (and the people who are the interpretive subject) are inherently smart (Heumann Gurian, 1991) and that interpretation does not have to mean providing the ‘right’ answer (Baxandall, 1991).

What the interpretive presentation should do is provide as accurate an experience as possible. “Do museums appreciate how difficult it is for modern people to feel and think their way back into the past?” (Hudson, 1991, p. 461) People of other cultures, people in the past, and visitors in their daily lives use all five senses to make sense of the world around them; the museum restricts visitors often only to two (1991). Just re-creating the sights and sounds of a place or people or time does not get at the, “intangible, the ephemeral, the immovable and the animate” (Kirshenblatt-Gimblett, 1991, p. 394).

The sensual authenticity that is sought to create new experiences in museums is something that living history museums have always wanted to provide to their audiences (Handler & Saxton, 1988). We should, however, consider that this authenticity should not come at the price of disconnection with the current cultural state that inevitably must inform the representation of another culture (1988). Nor should we forget that the representation of humans of the past often reflects our conceptions of those people today; and those images, once set, are very difficult to get rid of (Doering, Digiacomo, & Pekarik, 1999).

Interaction in Museum Interpretation

In this thesis, the term interactive denotes a sensory engagement between the visitor and something or someone else. Interactive exhibits or presentations specifically involve at least physical interaction between visitors and objects in a museum setting. There must be
feedback to the visitor from the object (or interpreter) in the form of information, be it verbal, cognitive, a tactile stimulus, or figuring out how something works. The word itself denotes the creation of action between two actors. In this section we will discuss the general utility of interactive exhibits in museums, some difficulties that they present, and some keys to successful design.

Interactive exhibits have been shown to increase audience diversity, time spent in the exhibit, attracting power, and, importantly, visitor understanding of connections between themes (Davidson, Heald & Hein, 1991). Moscardo’s (1996) Mindfulness Model of Interpretation predicts that, since variety and control contribute most to mindfulness (see: Interpretation, above), then interactive, participatory, multi-sensory exhibits will be most likely to create mindfulness in visitors.

Falk frames benefits of interactives in terms of their positive effect on learning in museums (Falk, et al, 2004). Overall learning experiences at museums are positive because of the multi-sensory experiences that museums offer (Falk & Dierking, 1992). The tangibility of interacting with objects, “is a powerful device for sense-making, and thus, understanding” (p. 114). In interviewing visitors about the meaning of the word museum, he found three kinds of answers: museums encourage socialization and positive personal contact and communication; feedback from museums is very personalized; and “they encourage ‘learning by doing’” (p. 173) and real-life applicability of information. Museums, it seems, by nature are interactive. They also found that there are four major categories of learning from interactives, which bear a striking resemblance to Pekarik, Doering and Karns’
1999 work: knowledge and skills; perspective and awareness; motivations and interests; and social learning.

Creating successful interactive exhibits is not simple, however. Allen and Gutwill (2004) warn against, “five common pitfalls” (p. 199): too many objects, not enough structure resulting in many unintended outcomes; aspects of the interactive exhibit (or even exhibit visitors) interfere with one another; the exhibit is interactive to the point where users can disrupt the intended outcome; so much is included in the experience that the intended message or theme is obscured; and secondary themes become more interesting or important than the central one.

West (2004) points out that there are many other downsides and difficulties to having interactive exhibits, such as increased cost of design and maintenance, the exhibit may appeal to different visitors than a non-interactive one, and exhibits that don’t work properly can destroy the sense of place and reliability of the whole museum. The interactive exhibit must be purposefully designed and installed so as to avoid the Disneyification of the museum. Video and computers just for the sake of the technology will create an air of inauthenticity. Interactives should be seen as tools that can do specific jobs which can help move the museum along towards its interpretive and experiential goals. “Physical interactivity […] is not a simple and universal prescription for effective learning” (Allen, 2004, p. 30). Care must be taken to keep from overloading visitors with too much interaction and too many demands (2004).

Meaningful experiences can be created using interactive exhibits, but the creator and interpreter must know the purpose of the interactions, the details of how to design it, and
include a strong social element (Adams, Luke, & Moussouri, 2004). Like other kinds of museum interpretation, an interactive is just a means to an end, and it must work with, not against, the visitor interest and agendas (2004). How effective an interpretive exhibit or presentation is depends on the interactions created between the visitor, the exhibit, and interpreter, not just on the objects or information in question (Light, 1995; Shettel, 2005).

Spock (2004) notes that interactive exhibits have become so popular that most museums make sure any new exhibit has some level of interactivity. But, “interactives don’t teach. Rather, interactives provide opportunities for visitors to learn as they like” (p. 370). This sort of constructivist technique allows for the visitor to come to more than one conclusion, and different visitors may not take away the same messages or themes. Interactivity tends to make exhibit learning more engaging and fun for the visitor, but when multiple, dissonant outcomes are acceptable or expected, evaluating the success of the exhibit can be extremely difficult.

Some living history museums have pushed forward with measuring the effects of intense interactive exhibits, with interesting results. Jackson (2000) discusses the use of participatory theatre as a type of interactive interpretation at living history museums. Theatre in Education is a roving group that puts on first-person living history presentations, all over the country. His qualitative study finds the use of visitor participation creates many opportunities for positive serendipity, and involves visitors in the debates and decision-making, and therefore the interpretation itself.

Funch (2006) describes an ‘immersive interpretation’ where the visitor, intimately, intensely, and realistically becomes part of a first-person interpretation scheme that re-
creates the hardships being a refugee. “[The level of detail] makes the situation seem horrifyingly realistic. The soldiers, portrayed by professional actors, are dressed in uniforms, carry guns, and confront the visitors in the most direct way” (p. 205). Certainly this experience is not for the interpretive faint of heart, and the museum must believe there is good cause for putting visitors through such a performance. However, the strong emotions and intensity of the experience made an impact. “People interviewed were able to describe in detail what happened to them, and even three or four months later they were able to remember details to an unusual extent” (p. 210). Visitors also reported very high levels of empathy with the interpretive subject.

Museums are becoming more and more about physical, emotional, and intellectual interactions between visitors, ideas, objects and interpreters, “where neither persons nor things take precedence” (Hein, 2007, p. 77). This interaction is more prevalent at museums than most other education or cultural institutions (2007). It is not the museums role, necessarily, to fill visitors with information and facts because museums are notoriously slow sources of information, and inefficient compared with places like schools and libraries (Leinhardt & Crowley, 2002). It is the experience of interacting (to whatever degree) with real, authentic objects that gives museums an edge. When visitors can be in contact (even visually) with authentic objects, it makes history more vivid and real. However, visitors must also be considered essential actors in creating the visit experience; without visitors to interact with the objects and interpretation, the authenticity and power of the objects would not exist (Leinhardt & Crowley, 2002).
Summary

Interaction between people and objects forms the theme that draws together Actor-Network Theory, interpretation and museum interpretation. For the former, interaction is the basis for power, for agency and for the existence of actors at all. For the latter two, interactions are the basis for re-creating authentic setting, for improving visitor learning and enhancing visitor experiences.

This thesis examines the usefulness of human/object interaction in improving visitor experience satisfaction, but bases the reason for increased interaction in museums on the theoretical foundations of ANT. The following four chapters explore the research that was conducted on this topic. These next chapters are written in a non-traditional thesis style. They are each written as pull-out articles for later publication. As such, each discusses only a single aspect of the thesis research and analysis, and each has its own internal structure. To enhance the readability of these chapters as a single thesis, we begin with an article (Chapter 3) that describes in detail the creation of the interpretive presentation off which most of the other articles are based. Chapter 4 describes the adaptation and implementation of the museum visit experience satisfaction scale which was used to measure the outcomes of a quasi-experiment described in the following chapter (Chapter 5). There is also a short chapter (Chapter Six) that discusses the impacts of interactive presentations on the presenter himself, based on field notes and observations. Finally there is a brief synthesis of these chapters, integrated into the final conclusion.
CHAPTER THREE

SUBSTITUTION, REPRESENTATION AND INTERPRETATION:
HOW VISITORS, INTERPRETERS, AND OBJECTS INTERACT
TO CREATE EXPERIENCES IN A
LIVING HISTORY MUSEUM

Introduction

Where visitors and interpretation meet, visitor experience is created. On one side, visitors bring their agendas and expectations with them when they visit museums (Falk, Moussouri, & Coulson, 1998). On the opposite side, museum interpretation can effect visitor, learning, perception and attitudes (Brochu & Merriman, 2002; Ham, 2007). The interaction of visitors, museum interpreters, objects and spaces creates visit experiences in museums. Actor-Network Theory (ANT) provides an ontological, theoretical framework to understand not only the nature of these interactions, but also a better understanding of what kinds of visit experiences are created from the interactions.

This chapter asks the following questions about visit experience in a living history museum: how do visitors understand and empathize with another culture? What aspects of the experience are the most important to visitors? How was the experience itself created? This research looks to Actor-Network Theory (ANT) for a basis for understanding how people and objects come together in the creation of culture as well as museum experiences. ANT posits that what we experience in life and who we are is an effect of the interactions between many different people and things (Latour, 2005). In ANT-speak, any person or thing can be called an ‘actor’ and any actor is itself an effect of the relationships and interactions of other actors – an actor-network (Law, 1992). Here the concept of actor-networks is applied to the experience that visitors have in a living history museum. This
This chapter first examines the process of creating and implementing an interpretive presentation. Using the concepts of ANT, the creation of an interpretive presentation is conceptualized as a process of steps from research, to substitution, to representation, to interpretation and interaction. To augment this examination of interactions, visitors who attended the presentation were asked to answer questions about what they felt best helped them understand the culture that was being interpreted, what could be done better, and what else they’d like to know about the people in question.

**Literature review**

*Actor-Network Theory*

In the ontology of Actor-Network Theory (ANT), societies and cultures are created, maintained and changed through the interactions not only between humans, but between humans and non-humans such as texts, technology, semiotics, animals, plants and more (Callon, 1986; Latour, 2005; Law, 1986; Law, 1992). Actor-Network Theory defines reality as an effect of interactions between many heterogeneous actors. For this reason, what may be labeled as purely social, technical or natural may in fact be an effect of interactions between many heterogeneous actors.

Instead of following most sociological theory and focusing only on humans as having agency, ANT pushes the other direction: human behavior and existence is permitted by non-humans (Latour, 2005). This is, “neither simple technological determinism nor social
constructivism” (Akrich, 1992, p. 206). ANT is not interested in inventing social theories and forces, but only in finding, “the procedures which render actors able to negotiate their ways” (Latour, 1999, p. 20). This brings a very literal and empirical stance to the study of what and who acts to create reality.

The concept of the actor-network is at the heart of ANT. An actor-network does not function the way networks such as the Internet work, based on nodes and line-like connections (Latour, 1996). Nor does the study of actor-networks have much in common with the study of social networks (1996). Instead, an actor-network is, in part, a creation of the researcher. It is a, “tool to help describe something, not what is being described. [It is] a concept, not a thing out there” (Latour, 2005, p. 131). In fact, Latour (1996) emphasizes the strong reflexive aspect of ANT, where the researcher is part of the actor-network and the tracing of actor-networks. “A network is not a thing, but the recorded movements of a thing.” (p. 378) To create an actor-network the connections between actors must be physically traceable and empirically recordable, and involve effort on the part of the relevant actors (Latour, 2005). It is also beholden to the researcher not to look beyond literal, physical, everyday events to explain the actions involved in an actor-network (Latour, 2005). There is no invisible force to draw answers from, only the effects of the interactions of actors (Latour, 1996).

An actor-network, then, is the traced associations and interactions of many heterogeneous actors (Law, 1992). Heterogeneous here denotes that actors are not only humans but any relevant agent of action, be it animal, vegetable, mineral, technology or text (1992). These actors, however, are not perfectly discreet entities, but themselves products or results
of the interactions of other actors and can therefore be regarded as actor-networks themselves (Law, 1999). It is, for the most part, the researcher who must decide how far and how many connections to trace in the actor-network in question; otherwise the study would go on forever. The researcher must constrain himself to the most relevant connections of the network to prevent the study from becoming unwieldy (Hitchings, 2003).

ANT, “does not celebrate a difference between people [and] objects. It denies that people are necessarily special” (Law, 1992, p. 4). ANT is an attempt to prevent humans from always being the most important actor in social research, because, empirically, this is not the case. However, this is an, “analytical stance, not an ethical position” (p. 4). ANT does not deny that people have rights, responsibilities or ethics that cannot be applied to non-humans. It simply does not want to define a priori what those ethics are, how they must be applied, how they came in to existence, and how they continue to be used. ANT also denies that it is only human actors that have agency. In ANT it is relationships and associations which grant agency, because things completely by themselves have nothing to act upon, and therefore cannot act (Cordell & Shaikh, 2006). Agency is an effect of interactions between actors.

Another important ANT concept is that of performance. Law and Singleton (2003) note that the actor-network itself is a performance. Since no relationship between actors is eternal or perfectly stable, the process of creating a network and holding it together is a task performed between many heterogeneous actors. Law (1992) notes that, “almost all of our actions with other people are mediated through objects” (p. 3), of some kind. As the arrangement and existence of those objects changes within the network, so too will the network change.
For example, human organs can be seen as part of the actor-network that creates the human body. If the liver fails, the connections between the other parts of the system begin to fail, and we may attempt to substitute non-organic (mechanical) actors to fill the role of the liver so that the actor-network of the body can continue to function in a certain way. However, the substitution is rarely equivalent to the original and the network may need to be altered or enlarged (with the inclusion of dialysis or a liver transplant). However, the cause of the liver failure is part of what is creating the current state of the body actor-network. If the cause (alcoholism, cancer) continues to affect the network in the same way, the system will continue to fail. The functioning state of any human body is not just an interaction of organs, but the interaction between organs, diseases, social conditions, technology and more. The actor-network performance is not restricted to internal actors, but must include external actors as well. In fact, what is internal and external, micro- and macro-, subject and object must not be predefined for any ANT study because the terms are hardly ever as clear as they at first seem to be (Latour, 1999).

In 1986 Michel Callon published a monograph in which he outlined his ideas to create a language and framework for dealing equally with all actors involved in a sociological study: a sociology of translation. Few ANT studies have since used the term, sociology of translation, but its three founding principles were incorporated into ANT: agnosticism (treating all actors in a study impartially), “generalized symmetry (the commitment to explain conflicting viewpoints in the same terms) and free association (the abandonment of all a priori distinctions between the natural and social)” (p. 196).
As in any part of an actor-network study, the measures of distance and size should not be assumed beforehand. Often in ANT studies, the distinctions between what is micro-scale and what is macro-scale begin to break down. “Instead of having to choose between the local and the global view, the notion of network allows us to think of a global entity – a highly connected one – which nevertheless remains continuously local” (Latour, 1996, p. 372). ANT, however, does not discount the idea of scale; it forces us to question whether what seems to be a purely local phenomenon is truly local. An actor-network may succeed because it can mobilize the efforts of other actors and actants that may be quite distant (Callon, 2004). Through the tracing of associations, actors that may be spatially or temporally distant may turn out to be very close to each other in an actor-network (Murdoch, 1998).

**ANT and Museums**

Gielen (2004) notes that museums are responsible for creating interpretation for the public, but when it comes time to study the outcomes, visitor studies focus too much on the social demographics and background of visitors, and not enough on the relationship between the museum historians, presentations and the visitor. In museums, “How the past is ‘staged’ [...] has an influence on those to whom it appeals” (p. 147). This too affects museum exhibit outcomes. By presenting something as centrally important, museum professionals make that topic important for the visitor. However, visit experience and learning are also partly predicted by visitor choice. Museums, as they exist, are interactions between visitors, objects, the interpretive process, historical texts and many other heterogeneous museum actors.
Hetherington (1999) explores the issue of seeing, subjectivity and heterogeneity in museums over time. Museums, for many centuries were exclusively for collecting and displaying many kinds of objects and materials in close proximity. However, museums have become spaces of strict ordering, where spaces and objects are homogenized to make some aesthetic or historical sense for the viewer. Museums have become reflections of the modern search for order in all things. He also notes that the idea of heterogeneity is shifting, and that the future of museums may need to extend beyond the realm of seeing, where the difference between subject (the viewer) and object is less obvious. He suggests that involving the sense of touch will help overcome the strict subject/object relationship of museum spaces.

Methodology

The Setting and the Quasi-experiment

This exploratory research took place over 30 days in the summer of 2007, at the Gibbs Museum of Pioneer and Dakotah Life, in Falcon Heights, Minnesota. The museum is a nine-acre, open-air, historic site; a living-history type museum, run by the Ramsey County Historical Society. It is very close to both Minneapolis and St. Paul, in an urban area of the Twin Cities. The museum has two basic interpretive halves to it: the pioneer area and a Dakotah (a Native American tribe) area. Using the life story of Jane Gibbs, a white settler with life-long ties to the Dakotah, the museum interprets 19th century life in what is now Ramsey County, Minnesota. I previously worked as a historic guide (interpreter) for a year and a half at the Gibbs Museum (2005-06), and the museum staff was very encouraging and helpful in the creation of this 2007 research project.
The overall research project asks three major questions: Is there a significant difference between interactive and spoken presentations on visitor experience? (Chapter Five); Is this museum visit experience satisfaction scale appropriate to measure this difference? (Chapter Four) and; How do visitors feel they best understand, empathize with and connect with another culture in a museum setting? It is this third question with which this chapter is concerned.

To help answer these questions, a quasi-experiment was used. The core of the experiment was an interpretive presentation regarding the Dakotah relationship with the corn they harvested, stored, ate and planted. This presentation had two treatments, or versions: a spoken-only version; and an interactive version. Only one treatment was presented per day so that visitors would not know of the other version. A museum visit experience satisfaction scale (adapted from Pekarik, et al, 1999) was used to measure differences between the treatments, and was part of a questionnaire that adult visitors filled out at the end of the presentation. (Chapters Four and Five deal with these outcomes.)

Four open-ended questions about the visitor’s museum experience were included on the questionnaire, and these questions were critical to understanding how visitors understand the Dakotah culture that was presented to them.

What is culture?

The four open-ended questions ask visitors to talk about the best ways for museums to help them understand another culture or society; in this case, aspects of the Dakotah culture, in the early 1800’s. There are a number of methodological questions that need to be addressed, so as to understand what exactly these open-ended questions are asking.
First, what is Dakotah culture? This research followed the lead of the Gibbs museum and did not use the loaded term ‘culture’ in the visitor questions, because of the number of ways culture can be conceptualized, and because of confusion the term may have caused. Instead, we asked visitors about Dakotah ‘life.’ In a way, life is even more broad and vague than ‘culture,’ but is so broad that there should be less confusion for visitors. ‘Life’ refers to everything that Dakotah individuals and societies experienced during that period of time. By using the term, ‘life,’ visitors would be less likely to be constrained in their answers. Visitors can answer the questions instead of trying to figure out what is meant by ‘culture’.

So, then what is Dakotah life, as presented in the Gibbs museum? Is Dakotah life of the 19th century actually here in the 21st century? Not quite. So what is this ‘life’ that we are interpreting for visitors? To answer this question, the process of creating an interpretive presentation is considered as a performance between actor-networks. Here we look to how modern, heterogeneous actors are substituted to represent historical ones, and how these actors perform together to create an interpretation of Dakotah life in the 19th century.

Creating interpretive presentations

One of the major tasks in creating this project was to research, design and implement an interpretive presentation. As a historic guide (an interpreter), I presented to visitors what I understood to be a reasonably accurate picture of one part (the Dakotah yearly relationship with corn) of a named actor-network: “Dakotah life in the early 19th century.” As this actor-network no longer exists, my presentation of it was based on descriptions found in historic texts reproduced on the internet, in museum documents, oral histories, archaeological research, and original and reproduction artifacts. These can be considered heterogeneous
actors that helped inform the creation of the presentation. However, interpretation is not simply the regurgitation of facts and information (Brochu & Merriman, 2002). Interpreters create a story, and a messy pile of information makes a poor story.

Designing presentations is not merely intuitive, but also based on the best practices of the field of interpretation. I needed a theme for the presentation, and many themes were considered. The final theme was chosen because of its novelty to the museum, its perceived attractiveness to visitors, and the ease of substituting for the original objects involved. From the very first moment, the creation of the presentation was influenced by modern actor-networks. Once I had settled on the theme (the Dakotah relationship with corn throughout the year) the presentation design was based on thematic interpretation (Ham, 1992). A theme should have approximately five main topics, all of which must support the theme. The information which was useful to the theme and its topics was organized into a text [Appendix B] which was one manner of representing the story of the actor-network I was interpreting. This text served mainly to develop the themes and topics, and as a kind of study guide. This text had far more detail and information than was possible to relate in twenty minutes, so it is also important to recognize that the actual presentation was not the same as the text. Though the themes, goals and topics were essentially the same, personal interpretation (the presentation) must be treated in a very different way than interpretive writing (Brochu & Merriman, 2002).

I began the process of creating the presentation by first gathering information about the objects, texts, and artifacts that represent the early 19th century Dakotah relationship with corn, and tried to fit them together into a narrative and conceptual representation. I then took this representation of Dakotah culture, decided out what aspects of it best achieved the
interpretive goals of the theme I wanted to present, and then I began to create a presentation around it. The re-creation of a historic actor-network also includes the visitors, to varying degrees. Sometimes visitors simply listen, sometimes they more actively participate. Visitors often take the information and make it fit in with what they already understand (Falk & Dierking, 2000; Light, 1995), though the very best interpretation can have the effect of making visitors rethink their preconceptions (Ham, 2007).

I wanted to bring together relevant heterogeneous actors of the time in a way that makes their interaction clear to visitors, with a final goal of visitor learning (both factual and conceptual (Belland, 1986)), understanding, and experience satisfaction. To accomplish this, and because the museum conducts mainly guided tours, I employed one of the most successful interpretation techniques: personal interpretation (Brochu & Merriman, 2002).

Substitutions and representations in “Corn of the Dakotah”

For the presentation I tried to conceptualize “Dakotah life in the 19th century” as an effect of the interactions of many heterogeneous actors. I interpreted part of that actor-network, as another actor-network: the Dakotah relationship with corn in a yearly cycle. It was my intention to present this actor-network in the form of an interpretive presentation called “Corn of the Dakotah.” I had the text and the information, but I needed to include physical actors from the actor-network. The people, plants and animals from that time are dead, landscapes have changed dramatically, and it was inappropriate (because of conservation issues and cultural sensitivity) to use the surviving authentic artifacts from that period. So, I had to substitute modern actors in their place: reproduction artifacts, an interpretive guide, and spoken stories that evoke images in the minds of the visitors. These substitutions had to be as close to the original as I could reasonably manage.
To understand this process of substitution, representation, and interpretation, we can begin by looking at who and what turned out to be relevant actors in this re-created actor-network. First, the human actors. Both the interpreter (the presenter) and visitors would play key roles in the performance of representing the actor-network by interacting with the objects. However, since part of this research was a quasi-experiment, it was necessary to reduce the amount of unwanted variables that might act on the two presentation treatments. For this reason, there was only one presenter. I wanted to test the effects of interactive presentations on visitors as a group (as an actant), but I was not interested in the effect of different presenters on visit experience. I considered looking for and hiring a Dakotah ancestor to give this presentation, but I had neither the time to do so, nor could I have afforded to pay her. It would have been culturally insensitive for me to pretend to be a Dakotah or wear the clothing of the period, as I cannot claim Dakotah ancestry. As well, wearing a leather loin cloth would have been much too distracting for visitors and for me. The museum, however, requires that interpreters wear period clothing, and so I wore canvas pants, a reproduction pioneer shirt, suspenders, and a straw hat. Another issue in representing the human aspect of the network concerned gender. Nearly all issues in Dakotah life that related to corn were the woman’s job (Gibbs Farm Museum, 1997). As I had no realistic option but to give the presentation myself, I could not represent myself as a different gender. This substitution of ethnic and gender identities which differed strongly from the original actor-network was indirectly reflected in visitor reactions, as will be noted below.

The cultural objects also needed to be represented in some form. The museum does not own Dakotah artifacts from that period, and, in any case, the risk of damage would have
been too great to use original artifacts. Reproductions of those artifacts were the only option. There were many objects that were involved in the Dakotah relationship with corn, but only a selected few could be integrated into a twenty-minute presentation. Here I will discuss only some of those, beginning with the corn itself. It was my good fortune that a friend of mine who works at the museum saves and propagates heritage seeds, including corn. He generously supplied me with a number of corn cobs and seeds that are genetic descendants of corn planted in the upper-Midwest by Dakotah and other tribal groups (Red Elk, personal communication, June 2007). Part of the presentation was visitors pounding the corn but, due to the rarity and high value of Dakotah corn, I had to substitute corn bought at a feed store. My friend told me this corn was hard enough to reasonably represent the harder varieties of corn that the Dakotah panted. I noted this substitution to visitors, who accepted it without issue; visitors seemed to understand the affects of current actor-network restrictions on the representation of past ones.

Whole corn can certainly be eaten, but the Dakotah also made a corn meal and used that in different dishes (Pond, 1986; McLaughlin, 1995). I settled on the use of wooden mortars and pestles in my presentation, though Dakotah use of them was not entirely conclusive (Pond, 1986). I substituted information from other Woodland tribes (an archaeological/anthropological term) (Prindle, 1994), on the reasonable assumption that there were cultural and technological relationships across the Woodland tradition. As well, I tried to use some common sense: there was a lot of hardwood available in the area, but very little of the good volcanic stone for making manos and metates (Minnesota Geological Survey, 2004). Having found suitable, fresh logs in the Twin Cities (a serendipitous windstorm), I attempted to burn and hollow the mortars as the Dakotah likely would have
A lack of expertise, time and expendable logs made me give up burning and fall back on drilling the holes with a large-diameter bit brace hand-powered drill that white settlers of the time would have used. Pestles were created with a modern hatchet and rasp.

The Dakotah and their neighbors stored their corn in a number of ways (Buffalo Bird Woman, 1994; Pond, 1986; Red Elk, personal communication, June 2007), but for space and ease of use in this presentation, I represented only two. Barrels made of bark were buried in the ground to store corn for food, and corn for seed was stored in leather pouches and carried by the women. I borrowed a leather bag from the museum that was a replica used for another purpose, and sewed together the bark from the mortars with spare leather strips to make a small barrel.

Another important and simple object was the seed germinating bundle. To ensure that the seeds they planted would sprout and produce a crop in the short Minnesota growing season, there is some indication that the Dakotah sprouted their corn seeds before planting (McLaughlin, 1999). The women would select the best seed, wet it with warm water, and wrap it in layers of cut grasses, tie it up and keep it warm until it germinated (1999). This grass was easy to re-create, especially after the museum’s lawns had been cut. For string I substituted jute twine that looked like a reasonable facsimile of hand made fiber string.

The landscape setting was another major actor in representing the actor-network. The museum itself has a large area of re-planted native prairie plants, and lots of trees to block out much of the surrounding golf course, buildings and streets. Visually, the setting is a good substitution, considering the urban location of the museum. In this prairie area, the museum has constructed a replica bark lodge (the Dakotah summer home), tipis (winter home) and a medicine garden. For the presentation space I used an area near the barklodge
in the far northwest corner of the site, neatly placed in the shade of trees. I cleared an area underneath these box elder trees and set up benches, like a small amphitheater. This was done to create a comfortable area for visitors, and was a trade-off between re-creating an authentic setting and a pleasant visit experience. I expected few visitors would want to sit on the ground. In future interpretive creations, this does not necessarily need to be such a dramatic trade-off. With more time and money, I could have fashioned a seating arrangement which corresponded to visitor expectations of comfort as well as a more accurate physical and spatial representation of Dakotah life in the 19th century.

With the representational actor-network prepared, I did two days worth of practice runs before beginning the actual data collection. This was to proof both the presentation and the questionnaire. Aside from a little tweaking, the practice was successful. The presentations occurred four times a day, timed and located to begin at the end of the museum’s Dakotah tour.

On the spoken treatment days I had the objects displayed but did not manipulate the objects, or have the visitors do so. I engaged and interacted with the visitors verbally and cognitively as best I could; depending of the kind of audience I had that day.

On interactive treatment days, I did the same quality presentation, but had visitors hold the seed bag, feel the corn, pound corn in mortars and pestles, make grass bundles to germinate the seeds, take corn out of the barrel, and try out (not too hard) the museum’s buffalo scapula hoe.

While I was giving my presentations, the other guides were conducting regular tours. In the Dakotah area, there are several main stopping points on the approximately 45 minute Dakotah tour. The tour begins at the reproduction Dakotah vegetable garden, moves to the
tipis, walks through the turtle medicine garden, then to the bark lodge and travois replicas. Guides mainly presented the interpretation verbally, though in the bark lodge they could demonstrate reproduction artifacts and allow visitors some hands-on experiences, as well. When finished with the Dakotah tour, visitors could opt to stay for my presentation, or move on to the pioneer area of the museum, if they hadn’t already. At the end of the presentation they could voluntarily fill out my questionnaire; most did.

Visitors and the representation of Dakotah life

It was this experience of moving through a certain space, interacting with guides and objects and landscape that visitors were considering when answering the four open-ended questions at the end of the questionnaire. Visitors wrote their answers not only about the finished product, but by proxy the development of that interpretive product. Visitors told us about how the museum was successful (or not) at re-creating an actor-network that involved not just ‘facts’ about Dakotah life, but accommodated (if not expanded) the visitor interests, time constraints, and prior conceptions.

These questions were not, then, literally trying to get visitors to rate their ability to understand, know and empathize with Dakotah life in the early 19th century, as the questions might indicate. Neither is this article is about how well visitors actually understood Dakotah culture of the early 19th century, because it is not an examination of the accuracy (how ever that is defined and enforced) of the information presented in the museum. Nor is this article trying to gauge how well visitors learned factual information that was presented to them. This research is an effort to understand what visitors feel best facilitated their museum experience and ability to understand, empathize with and relate to the substitutions, representations and interpretations of another culture. Even though this was not how the
questions were phrased, we can reasonably assume that visitors were not expecting to perfectly experience Dakotah life, no more than visiting an aquarium is exactly like snorkeling in the Caribbean. These are reasonably authentic aspects of Dakotah life, ported through time and space and reconstructed within the actor-network confines of the setting. In this case, the museum reproduces certain aspects of Dakotah life according to what is known about it, what is interesting to the interpreters and the public, and what is feasible on a museum budget.

**Analysis of visitor responses**

Four open-ended questions were created to explore broad facets of Dakotah life. Each question had three lines in which visitors could write their answer, and the questions were 28 through 31 on the questionnaire. Broadly following the data analysis methods of coding and categorization by theme as described in Miles and Huberman (1994), the written responses to the questions (the data) were transcribed from the questionnaires into a spreadsheet format, which also included the questionnaire number, and an ‘i’ or an ‘s’ depending on the treatment type. To perform the analysis, a system of layered categorization and themes was used. First, the visitor responses were examined for very specific similarities and grouped into categories. Each question had between 150 and 200 responses, and those responses fell into 30 to 56 categories per question. Those categories were then examined for similarities themselves and grouped into themes. For some themes there were also sub-themes: specific groupings which provided another level of data interpretation and nuance.
Over the next few months, the raw data (the uncategorized responses) were re-categorized twice more, using this same method. This repetition was done to see if I would find new categories and themes, having not considered the data for several weeks. The final three sets of categories and themes for each question were compared for similarities and the strongest categorizations and themes were kept. Each of the four questions had one final ‘outline’ of the data [Appendix D]. Themes and categories were listed, in descending order, by the number of responses they contained. The themes and categories of responses to these questions will be discussed here first individually and then together.

Question #28: “Please help us improve our services to you, our visitor. What can we do to make you more likely to visit the Gibbs Museum again?” This question was actually separate from the last three questions, as it was initially included for the benefit of the museum. However, the answers were relevant enough that it has been included in this analysis. So, what makes visitors likely to return? The most common theme encompassed on-site museum interpretation. Visitors very much want to see more variety and novelty in the presentations, exhibits and special events. Interactivity, including hands-on with objects and interactions between visitors and guides, was an important category, as was ensuring that the museum has child and family-friendly exhibits and activities. Authenticity ranked surprisingly low, perhaps because it is taken for granted. The next most populated theme is comprised of answers that were not suggestions, mainly composed of, “no changes needed,” and “great job!” The final three themes were concerned with other aspects of the museum, such as accessibility (longer hours, better orientation), visibility/communication (better advertising, better pre-visit site orientation on the website), and finally basic needs such as more accessible drinking water and bathrooms.
These last three questions were all below a note on the questionnaire that was meant to orient visitor thinking: “One of our main goals at the Gibbs Museum is to enable visitors to understand what life was like for the Dakotah.”

Question #29: “During your visit today, what most helped you to think about life from a Dakotah point of view? Why do you think it was effective?” This question was created to understand what visitors felt was working well in the museum interpretation. The responses to this question needed no sub-themes, they could be clearly elaborated in eight distinct themes, listed here in descending order of the quantity of corresponding responses: Personal Interpretation; Interactivity/Sensory Experience; Learning/Informational Experience; Objects and Their Spaces; Social/Personal/Emotional Connections; Other; Authenticity; and Non-personal Interpretation. By far, visitors noted aspects of personal interpretation as being the most helpful to thinking about life from a Dakotah point of view. This included categories such as, ‘presentations,’ ‘the presenter,’ ‘guides,’ and ‘stories.’ The theme of Interactivity/Sensory Experience (hands-on; seeing; hearing) was about equal in responses to Learning/Informational Experience (facts; mention of specific details learned). This might not seem surprising. However, in the Interactivity/Sensory Experience theme, there were as many responses in the ‘hands-on’ category as the ‘seeing.’

Question #30: “If you could change, take away, or add anything (or many things) to the museum to help our visitors to understand the Dakotah, what would it (they) be? Why?” This question was included to see what visitors felt was missing from the interpretation and what should be removed. There was a huge amount of variation in responses to this question (56 categories), even though it had the least total number of responses of all the questions. Though categories were numerous, themes were simple: Interpretive issues; No
Suggestions; Basic Needs; and Other. There were, however, many sub-themes to cover the relatively large number of categories. In interpretive issues, the most populous sub-theme showed that visitors most wanted a Dakotah guide or interpreter. Many of the other categories in this theme were related to representations of things and people that weren’t present: pictures of Dakotahs from the 1800’s; Dakotah clothing; music; dancing. Often, visitors simply wanted more diversity or depth in what was already represented: everyday, household items; stories; demonstrations of daily activities.

Question #31: “If you could ask a Dakotah from the year 1820 anything about his or her life, what would you most like to know?” This question wanted visitors to talk about how they would to personally connect with the historic Dakotah people represented. This question was the most difficult from which to create clear categories and themes. The responses were extremely diverse, and yet they were all closely tied together. Of the three ways these responses were categorized and themed, one outline was quite distinct from the others; in it, the theme of Emotional Highs and Lows came up. Visitors wanted to know what was that person’s favorite thing, to know about their emotional lives, or to know if they were happy. Even looking at other themes such as “Survival” and “Personal Lives,” the responses to this question were very much about eliciting emotional responses and less about learning facts.

Across these four questions we can see one main pattern: most visitors want to interact with other people, or the representations of them, in this museum setting. The personal, emotional connections visitors make with guides, other visitors or images of Dakotah people were the most reported aspect of empathizing and understanding. However, connecting with authentic objects and spaces was also very important. Seeing,
using and interacting with everyday objects and spaces that are reasonably authentic representations of Dakotah life were instrumental for visitors to appreciate Dakotah life. Being able to put ‘hands-on’ was equally as important to the sensory experience as seeing the objects. The overall sensory experience was easily as important as acquiring relevant information, which may tell us that, as important as learning is, the sensory experience is equally powerful. Finally, properly orienting visitors to the museum and providing for basic needs such as drinking water and bathrooms also will affect the visit experience, and I would suggest the visitor’s ability to understand, empathize with and relate to the culture that is being presented. As when parents are distracted from the presentation because their children are distracted, if visitors have to wonder about where to get a drink of water, they won’t wonder about the interpretive experience before them (Brochu & Merriman, 2002).

**Discussion**

So, what does this have to do with substitution, representation and interpretation of actor-networks? Most obviously, the re-creation and representation of past lives involves the reconstruction of the interactions of heterogeneous actors in a historic actor-network. The number of actors connected in this network is nearly infinite and the interpreter decides which are the most useful, the most relevant. The interpreter then makes substitutions in an attempt to represent aspects of that actor-network, as it is essentially gone, or has changed so dramatically as to no longer be the same thing. These choices impact what the visitor learns, understands and how the visitor empathizes with this other culture.

But decisions of what to interpret are not simply based on what was authentic to the period. Substitutions and representations are influenced by the availability of texts and oral
histories, they are influenced by the goal of the interpretive presentation (a quasi-experiment), by budgets, by the current configuration of landscape and the plants in them, and by the visitor demographics and agendas. The experience visitors are getting in historic and living history museums, no matter how authentically it has been re-created, cannot be said to be an effect only of the actor-networks of the past. This is not to say that this experience is not authentic, nor accurate, nor does this belittle the power museum interpretation can have on visitors. The museum visit experience is a blend of remnants of actor-networks from the past (other cultures and people), with those of the museum, the visitor, the interpreter and others. Each visit experience will have its own unique topography based on these interactions.

In the case of this research, the experience that visitors had was an effect of the interactions of available information, physical, natural and historical setting of the museum and its objects, time constraints, budget constraints, interpreter interests, tours conducted by other guides, availability of reproduction objects, weather (bit of a drought that summer), visitor agendas and interests, the particular presentation version, interpreter personal interests, and moments of serendipity. This list is likely endless.

The effect of these interactions is reflected in what was said (and not said) in response to questions 28-31. There are patterns to these responses that shed new light on what is important to visit experience and why.

When considering that the presentation describes the relationship of Dakotah women to corn, it is important to remember that I, as presenter, am neither. This detail is made important because of visitor responses to these four preceding questions. There was a clear demand in visitor responses for a ‘real Dakotah’ descendant as a museum interpreter;
closest they could get to a Dakotah person from the 19th century. There was no Dakotah interpreter at the museum that summer. However, also visitors mentioned that they would like to see photographs of Dakotah people from that time. Photographs of Dakotah would then also be a reasonable substitution or representation of the Dakotah of 19th century. Photographs are certainly not the same as live interpreters, but it may provide a more satisfying experience for visitors than having neither.

However, the issue of gender was almost non-existent in visitor comments. Few said it would be important for their understanding of Dakotah life to see women’s roles portrayed by women, even though gender roles were likely quite strict and very important to social identity and cohesion for the Dakotah (Gibbs Farm Museum, 1997). This suggests that how visitors understand other cultures, is in part, based on what roles actors are assigned in their own culture (Doering, Digiacomo, & Pekarik, 1999; Falk, 2004). Since farming is not a stereotypical job for women in the current white culture of Minnesota (the dominant visitor demographic), it could be surmised that it was not as important for visitors that this role be filled by a female interpreter. It was more important that their interpretive guide be a Dakotah descendant. Here we see visitor culture interacting with the museum representations of the past. What is created is a visit experience called ‘Dakotah life in the early 19th century’ where gender roles are marginalized.

Visitors also indicated that they want to interact with the non-human actors representing this historical actor-network. For visitors, hands-on with objects was as important as seeing the objects, and sensory experience was as important as facts and information. Visitors want to experience and engage with a novel ordering of social connections which were once essential to the daily life of another human being. It is not
necessarily the case that visitors think these substitutions, representations and interpretations of the past are actually the past. Yet, the experience should not be called a simulacrum. The experience that visitors had was an interaction of represented actor-networks of the past with present ones. Living history interpretation does not simply mimic the past, it tries to help the present interact with a reconstruction of part of that past actor-network. This kind of experience in museums is not simply a pale copy of the past. It is a wholly new experience that shares connections between actor-networks of the past and the present. The living history museum visit experience is a nexus but also a creation, an effect of a meeting point.

**Conclusion**

The past that is represented and interpreted in historic and living history museums is an effect of relationships and interactions between actors that exist in the present, remnants of ones that existed in the past, and information derived from the study of those actors. The re-creation and interpretation of the past must be recognized as an effect of multiple actor-network interactions. This does not deny that the past existed nor deny the reality of artifacts or their interpretation; nor should it indicate that the present must override the understanding of the past. What must be recognized is that when we interpret cultures, when we interpret lives, we are not presenting perfect facsimiles of those people or those times. Who they were was an effect of the interactions they had with environments, technologies, and people who no longer exist or have changed dramatically. The identity of a people today is both grounded in the effects of that old heritage and the effects of current
influences. For this same reason, the experience that was ‘Dakotah life in the 19th century’ is not the same as the museum visit experience that is represented today.

The experience that visitors have, and how they understand, empathize with and connect to other cultures in a museum setting, is partly based on their own lives, their own understandings of the world. This understanding is also influenced by their interactions with the representations and interpretations of those lives. How interpreters represent actor-networks and encourage interaction with visitors will greatly influence visitor appreciation and understanding of those lives. The interpreter must balance visitor needs and expectations of the experience with challenging preconceptions. When visitors can manipulate objects, move through spaces, and interact with the substituted actors of another life in an authentic way, they can begin to understand how setting and objects affect how people live. It is the job of the interpreter to facilitate the interaction between represented actor-networks and visitor actor-networks to create a new experience that has deep connections to the past as well as the present.
CHAPTER FOUR
APPLICATION OF A MUSEUM VISIT EXPERIENCE SATISFACTION SCALE IN A LIVING HISTORY SETTING

Introduction

It has been assumed that diverse attractions such as art museums, historic museums, science centers, zoos and aquariums can be considered to be in the same general category of ‘museum’ (Blud 1990; Caulton, 1998; Falk & Dierking, 1992; Hein 1998; Hein, 2000). While defining these attractions all in one category may be semantically useful, the experiences that visitors have while in them may be dramatically different. It may be possible and useful to consider how museums are similar by the kinds of visitor experiences they provide. This chapter begins to ask this question by considering whether or not scales that measure visit experience in one museum type are applicable to another.

The visit experience has been considered in many different ways. Often it is considered for its effect on visitor learning, and though what visitors learn is very important (Falk & Dierking, 2000), learning may not be the central goal for many visitors (Packer & Ballantyne, 2002). Visit experience has also been considered more broadly (Falk & Dierking, 1992; Moscardo, 1996; Pekarik, Doering & Karns, 1999) and this research is interested in multiple aspects of museum visit experience as well as dimensions to which those aspects may belong.

This research reports the results of the application of a museum visit experience satisfaction scale, developed in Smithsonian museums (Pekarik, Doering & Karns, 1999), to a living history museum. The scale was used to measure the differences in outcomes of two treatments in a quasi-experiment, the results of which are detailed in chapter five. This
chapter discusses the reasons for utilizing such a scale, how the scale was used and the outcomes of employing such as scale in a setting different from where it was developed.

**Literature Review**

The term museum covers a very broad, diverse range of attractions such as, “art, history and natural history museums; zoos; arboretums; botanical gardens; science centers; [and] historic homes” (Falk and Dierking, 1992, p. 1). In this sense, museums collect, care for and display objects, including living objects. Museum types are then differentiated by the kinds of objects (living or not) that they keep in their collection (Hein, 2000). Here it is suggested that it may also be possible, and useful, to differentiate museums based on the kinds of experiences visitors have in the museum.

Much museum research and interpretive design has focused around understanding the visitor in the museum setting. Especially dominant has been the study of learning in museums. In fact, the museum has been defined as a place, “whose primary mission is education” (Bitgood, 2002, p. 461). This educational definition can be refined to understand the museum as a free-choice learning environment (Falk & Dierking, 2000). This definition allows a clear distinction between museum learning and learning in formal educational settings, such as schools.

However, many visitors do not come to museums only to learn. They may have many motivations, such as entertainment, social events (Falk & Dierking, 2000), relaxation, enjoyment, spiritual fulfillment (Falk, 2005), vacations, family outing, visiting with someone else, brought others to see the museum (Prentice, Guerin and McGugan, 1998), restoration, and social interaction (Packer and Ballantyne, 2002). Some visitors may not come to
museums to learn anything at all (2002). This does not mean that they won’t learn anything, and likely they will take away some piece of information, even if what they learned was not the museum’s intention (Falk, 2005). What this says is that learning is only one part, albeit an important one, of visitor experience. Researching museums solely as places of visitor learning may miss many other important aspects of the museum visit.

There are a number of studies that consider other ways of researching and conceptualizing visitor experience in museums. Falk and Dierking (1992) created a model for understanding visitor experience with three overlapping contexts: personal, social and physical. Where they overlapped was the experience itself. Understanding how the three contexts interact in a museum setting means understanding the visit experience.

Moscardo (1996) put forward the benefits of inducing mindfulness in visitors as a way to consider visit experiences. Mindful visitors, are, “visitors who are active, interested, questioning, and capable of reassessing the way they view the world” (p. 382). By creating a museum experience that has variety, interactivity, sensory experiences, engages the visitor, and allows for visitor control, museums can create mindfulness in their visitors’ experiences (Moscardo, 1999). Exhibits that create visitor mindfulness will then result in increased time spent with an exhibit, visitors will prefer that exhibit, they will be more interested in the matters interpreted, and can demonstrate increased learning and retention of the material.

Where Moscardo looked at visit experience from a theoretical perspective, Pekarik, Doering, & Karns (1999) developed a scale to measure the items and dimensions of visit experience satisfaction. To create this empirical framework, they created a 14 item list by asking visitors at Smithsonian Institution museums what experiences they were expecting
before, or found satisfying during their visit. In their analysis, they found four discrete dimensions of visit experience: object; cognitive; introspective; and social experience.

There are many ways to define and understand what is a museum. What is suggested here is that measures of visit experience developed in one setting may not be applicable to all types of museums. As Falk (2004) notes, there may be hundreds, if not thousands of variables that act on visitors (and therefore their experience) before, during and after their museum visit. What may be necessary is to develop tools that measure aspects of museum experience for specific kinds of museums, instead of museums as a broad category.

Methodology

This study used the Pekarik, Doering and Karns (1999) measure of museum visit experience satisfaction to conduct research at a small historic museum called the Gibbs Museum of Pioneer and Dakotah Life, in Falcon Heights, Minnesota, in the summer of 2007. The museum is set on nine acres of land in a rather urbanized area between Minneapolis and St. Paul. The museum interprets pioneer life in the 19th century in Minnesota, and has several historic structures on site. The museum also has re-created American Indian (Dakotah) houses and gardens of the early 19th century, and uses them to interpret Dakotah life-ways of the time. All personal interpretation at the museum is ‘third-person’ and not ‘first-person’ (character portrayal).

For the purposes of this research, a quasi-experiment was designed to measure differences between spoken-only presentations and presentations that include visitor interaction with reproduction artifacts. Central to the experiment was the planning and implementation of an interpretive presentation for the Dakotah area of the museum. This
presentation had two treatments (versions), called the spoken version and the interactive version. The spoken version had the relevant reproduction artifacts only for show, and the presentation was conducted verbally. In the interpretive version, the same information was told to visitors, in the same setting, but visitors now were encouraged to use the reproduction artifacts in an authentic way. Visitors were not told there were two versions of the presentation, and these treatments were randomly assigned days over a 30-day period.

The Pekarik, et al (1999) scale was adapted to measure the differences between the two treatments. Results of those differences are reported in Chapter 4. The outcomes that are relevant to this chapter are related to the adaptation, implementation and usefulness of the Pekarik, et al. (1999) scale in this setting.

The 1999 Pekarik, et al. scale was originally developed by asking visitors at eight different Smithsonian Institution museums to talk about what experiences they found satisfying. From these interviews the researchers developed a list of fourteen items of museum visit experience satisfaction. When measured on a large sample (several thousands) of visitors at the eight museums, those fourteen items factored into four different kinds of experience: object, cognitive, introspective and social experience.

Table 7: Dimensions and items of museum visit experience satisfaction.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object Experiences</td>
<td>Seeing &quot;the real thing&quot;</td>
</tr>
<tr>
<td></td>
<td>Seeing rare/uncommon/valuable things</td>
</tr>
<tr>
<td></td>
<td>Being moved by beauty</td>
</tr>
<tr>
<td></td>
<td>Thinking what it would be like to own such things</td>
</tr>
<tr>
<td></td>
<td>Continuing my professional development</td>
</tr>
<tr>
<td>Cognitive Experiences</td>
<td>Gaining information or knowledge</td>
</tr>
<tr>
<td></td>
<td>Enriching my understanding</td>
</tr>
<tr>
<td>Introspective Experiences</td>
<td>Imagining other times or places</td>
</tr>
<tr>
<td></td>
<td>Reflecting on the meaning of what I was looking at</td>
</tr>
<tr>
<td>Social Experiences</td>
<td>Recalling my travels/childhood experiences/other memories</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Feeling a spiritual connection</td>
</tr>
<tr>
<td></td>
<td>Feeling a sense of belonging or connectedness</td>
</tr>
<tr>
<td></td>
<td>Spending time with friends/family/other people</td>
</tr>
<tr>
<td></td>
<td>Seeing my children learning new things</td>
</tr>
</tbody>
</table>

*Adapted from Pekarik, Doering & Karns, 1999.*

For this study, these 14 items were included in random order on a questionnaire [Appendix C] that was administered only to adults (over 18) at the end of the presentation. Visitors were asked how much the presentation provided them with the following experiences (the items) and to rate each item on a scale of 1 to 7, with 1 as *not at all*, and 7 as *very much*. Total sample size was 302, with 131 in the spoken treatment and 171 in the interactive treatment. The return rate was 82%. As an incentive, visitors were offered cold, bottled water for filling out the questionnaire. Also on the questionnaire were questions about the importance and ability of visitors to interact with the interpreter, the objects and each other; demographics; visit reasons (adapted from Prentice, Guerin, & McGugan, 1998); overall satisfaction; likelihood of visitors to return; and four open ended-questions that asked visitors how they best understood and empathized with another culture.

**Results**

After the data collection was finished, the items were coded into SPSS and a rotated factor analysis was run, with an expectation of the 14 items factoring into the same four dimensions. This was not the case. Instead, two new dimensions (with an Eigenvalue above 1.0) appeared. These two new dimensions divided the fourteen items in half, seven items each. The two new dimensions together explained slightly more than 53% of the item
variance. When tested for reliability, the dimensions showed robust Cronbach’s alphas of .848 and .812, respectively, indicating a high degree of reliability, especially considering the relatively small sample size. A test of correlations (Pearson’s) [Appendix E] show a positive correlation between the two dimensions, indicating these two new dimensions also have good construct validity.

Table 8: New components and their Eigenvalues, variances and Cronbach’s alphas.

<table>
<thead>
<tr>
<th>Item</th>
<th>Component/ Dimension</th>
<th>Eigenvalue</th>
<th>% Variance Explained</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I felt a spiritual connection</td>
<td>.817</td>
<td>.130</td>
<td></td>
<td>.848</td>
</tr>
<tr>
<td>I was able to continue my professional development</td>
<td>.767</td>
<td>-.033</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I was moved by beauty</td>
<td>.759</td>
<td>.289</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I recalled my travels/ childhood memories/ other experiences</td>
<td>.607</td>
<td>.247</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I thought about what it would be like to own such things</td>
<td>.587</td>
<td>.369</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I reflected on the meaning of what I was looking at</td>
<td>.580</td>
<td>.559</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I felt a sense of belonging or connectedness</td>
<td>.564</td>
<td>.427</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The exhibit enriched my understanding</td>
<td>.045</td>
<td>.831</td>
<td>1.534</td>
<td>12.8</td>
</tr>
<tr>
<td>I gained knowledge/information</td>
<td>.012</td>
<td>.792</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I spent quality time with my family/friends/other people</td>
<td>.267</td>
<td>.619</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I saw rare/uncommon/valuable things</td>
<td>.424</td>
<td>.605</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I was able to imagine other times or places</td>
<td>.337</td>
<td>.595</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I was able to see the real/original thing</td>
<td>.429</td>
<td>.519</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I was able to see my children learn new things</td>
<td>.178</td>
<td>.450</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
This two-dimension model is a significant positive predictor of both visitor overall satisfaction and likelihood to return. In the case of overall satisfaction, the model predicts 16% of the variance in overall satisfaction and 18.6% of the variance of reported visitor likelihood to return. Individually, both dimensions are significant positive predictors of reported visitor likelihood to return. Only the Extrinsic/Cognitive Dimension is a significant predictor of overall satisfaction at a 0.05 level.

Understanding the New Dimensions

The new dimensions were created based on the strength of the item’s factor loading in the indicated component. Where an item has a high factor load in both components, the item was placed in the component where it had a higher factor load. The chart above lists items in each component in order of its factor loading. For Component One, it is first notable that many of the items have a strong emotional tone: I felt a spiritual connection; I was moved by beauty; I felt a sense of belonging or connectedness; I recalled my travels/ childhood memories/ other experiences. Other items are specifically related to very personal or self-centered issues: I was able to continue my professional development; I recalled my travels/ childhood memories/ other experiences; I thought about what it would be like to own such things). One other item, I reflected on the meaning of what I was looking at, had a similarly strong factor loading in both components. However, when the item was removed into Component Two, the Cronbach’s alpha decreased for both components, and so was left as part of Component One.

Several of the items in Component Two relate to cognitive processing of information and stimuli: The exhibit enriched my understanding; I gained knowledge/ information; I was able to see my children learn new things. The other items are visitors thinking about other
people and objects: I saw rare/ uncommon/ valuable things; I was able to see the real/ original thing, I was able to imagine other times or places; I spent quality time with my family/ friends/ other people, I was able to see my children learn new things. Component Two focuses on cognitive understanding and of objects and other people. These items may still be very personal but what they share in common is that they are all external to the visitor, including the subjects about which the visitor is learning. In stark contrast to the emotional, internalized experiences that make up Component One, Component Two considers cognitive experiences and stimuli that originate from objects of attention outside of the self.

There are two dualistic relationships between these two dimensions: self-centered vs. external experiences; emotional vs. cognitive experiences. Labels were giving to these dimensions of visit experience to reflect these patterns. Component One is now the Intrinsic/Emotional Experience dimension, and Component Two is called the Extrinsic/Cognitive Experience dimension.

While these components, or dimensions, are clearly different from the four found in the Pekarik, et al (1999) article, there are certain similarities. The new Intrinsic/Emotional dimension is made entirely of items that were Object and Introspective experiences. The new Extrinsic/Cognitive dimension contains all of the items that Pekarik et al found to be Social and Cognitive experiences, and includes Object and Introspective Experiences that relate to external objects, and other times and places.


<table>
<thead>
<tr>
<th>Intrinsic/Emotional Experiences</th>
<th>Extrinsic/Cognitive Experiences</th>
</tr>
</thead>
<tbody>
<tr>
<td>(O) I thought about what it would be like to own such things</td>
<td>(C) The exhibit enriched my understanding</td>
</tr>
<tr>
<td>(O) I was able to continue my professional development</td>
<td>(C) I gained knowledge/ information</td>
</tr>
<tr>
<td>(O) I was moved by beauty</td>
<td>(O) I saw rare/ uncommon/ valuable things</td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>(I) I recalled my travels/ childhood memories/ other experiences</td>
<td>(O) I was able to see the real/ original thing</td>
</tr>
<tr>
<td>(I) I felt a spiritual connection</td>
<td>(I) I was able to imagine other times or places</td>
</tr>
<tr>
<td>(I) I reflected on the meaning of what I was looking at</td>
<td>(S) I spent quality time with my family/ friends/ other people</td>
</tr>
<tr>
<td>(I) I felt a sense of belonging or connectedness</td>
<td>(S) I was able to see my children learn new things</td>
</tr>
</tbody>
</table>

(O = Object Experience; I = Introspective Experience; S = Social Experience; C = Cognitive Experience)

**Interpretation**

The central concept to consider, when interpreting these results, is the dualistic nature of the dimensions as they occurred here. Whereas the authors of the article from which the items come found four categories of museum visit experience (Pekarik, et al, 1999), this research finds that visitors to this presentation at Gibbs Museum are responding to two types of visit experience: Intrinsic/Emotional and Extrinsic/Cognitive. This first type of visit experience affects visitors internally, emotionally; they relate the experience to their own personal universe. It may be concluded that experiences that make visitors reflect more deeply about themselves are the more emotional experiences, or that emotional experiences are more likely to make visitors think about themselves and their experiences.

The second dimension describes both the cognitive experience and the object experience; thinking about others, learning about others. Visitor cognitive learning would then appear to be centered on learning about other things and people, and less about self-discovery.

Here, in two broad strokes, the museum visit experience is reduced to simple binary opposition. The clearest inference from these results is that creating a satisfying museum visit experience requires attention not simply to the extrinsic and cognitive aspects of the
experience, such as providing information or seeing objects. Visit experience also relies on creating emotional and intrinsically thoughtful experiences for visitors. This emotional experience may be the best way to get visitors to consider the relationship of the museum experience to their lives, personally.

This two-dimensional model is also a significant predictor of two very important measures for the museum: the visitor overall satisfaction; and the stated likelihood that the visitor will return. The model also helps identify significant portions (16% and 18.6% respectively) of what creates a satisfying museum visit, and what makes visitors more likely to return. Intrinsic/Emotional Experience does not appear to affect overall visit satisfaction. This may indicate that visitor overall satisfaction at the Gibbs Museum is most tightly tied to the experience visitors have with the objects that they see and the information that they gain during the visit. It may be the case that visitors come with an expectation of a certain type of cognitive learning experience, and a museum filled with objects.

Examining the specific items that make up the dimensions also provides insight into the visitor’s experiences in the Gibbs Museum. The item, *I reflected on the meaning of what I was looking at*, loaded heavily on both dimensions, indicating that meanings gained from the visit experience are both cognitive and emotional. However, the item loaded stronger in the Intrinsic/Emotional dimension and decreased the alphas of both dimensions when moved to the Extrinsic/Cognitive dimension. This indicates that, though the meaning of the experience for visitors is both cognitive and emotional, it is more emotional than cognitive. Similarly, a sense of belonging or connectedness loaded relatively strongly for both dimensions, indicating that, to create a sense of connection between visitors and the interpretive subject, the experience should be at least as much emotional as it is cognitive.
Another item, imagining other times or places loaded much heavier in the Extrinsic/Cognitive Dimension. To have visitors to imagine the times and places being interpreted is an important aspect of interpretation in living history museums. In this case, enabling visitors to imagine those times and places appears to be strongly related to cognitive learning, much more so than emotional impact.

Seeing things and objects (I was able to see the real/original thing, I saw rare/uncommon/valuable things) also had factor loadings that weighed heavily on both dimensions, though more so in the Extrinsic/Cognitive dimension. As the central point of this research was comparing spoken-only interpretation to interactive interpretation, it is important to note that getting to see objects creates more of a cognitive experience than emotional. It would be useful to compare those results with the results of a hands-on item of visit experience. However, the items in this scale do not include the experience of manipulating and interacting with objects. Object interaction may not have been common at the museums at the time when the originally items were outlines, but it is most definitely an integral part of many living history museums. It can be surmised then, that at least this aspect of the visit experience at the Gibbs Museum is not represented in this item list.

As there is a missing aspect of the visit experience, the question arises as to whether this list of items is complete for experiences like those at the Gibbs Museum. The answer is clearly, no. Pekarik, Doering, and Karns (1999) acknowledge as much in their article, saying that they do not consider the list of items complete nor perfected. It also stands to reason that if there are aspects of the Gibbs Museum visit experience not found on this list, then there are also aspects included in this list that are not appropriate to the Gibbs Museum.
There may also be items on this list that are similar to aspects of Gibbs Museum experience, and thus can somewhat stand in for them, but are not, in fact, the same.

Looking at how individual items predict overall satisfaction, only two (The exhibit enriched my understanding; I spent quality time with family/ friends/ other people) were significant predictors at a 0.05 level. At that same level of significance, two items were predictors of likelihood to return (I was moved by beauty; I spent quality time with family/ friends/ other people).

Aside from the implication that social experience in the Gibbs Museum is one of the most important aspects of the experience, it can also be noted that the majority of the items are not significant predictors of these two preeminent museum issues. This is not to say that these non-predictive items are hindrances, but it drives home the point that, in this scale, there are missing items and possibly items that are superfluous.

The differences in aspects of museum visit experience, and how those aspects are organized into dimensions of visit experience, leads to a logical, if rather obvious conclusion: visit experiences are not the same between museums. Though the Smithsonian Museums clearly interpret history, and likely cover many of the same general historical subjects covered by the Gibbs Museum (Native American life, pioneer life), the experience is not the same. The ability to interact with interpretive objects is one example of how the interpretation affects the visit experience. In addition, the visitors themselves may also change the visit experience. Falk and Dierking (1992) make the point that visit experience is intersection of visitor expectation, museum social experience, and the physical museum itself. The demographics of visitors to Smithsonian Museums may be significantly different than to the Gibbs Museum, and this may affect visit experience. Adult visitors to the Gibbs Museum were mostly female, and from the Twin Cities area of Minnesota. Visitor expectations also
affect visit experience, and expectations for the Gibbs Museum experience are likely to be quite different than those of Smithsonian Museums.

**Implications for Future Research**

It should come as no surprise that visit experience can vary significantly between museums, but there are important issues that arise that require extensive further research.

If museum visit experience is not the same between museums, then scales developed in one are not necessarily going to be effective in another. In this case, without a factor analysis, the items may have been accepted as universal aspects of four dimensions of museum visit experience. The two new dimensions that arose did have good construct validity, good reliability, and covered well over half of the item variance. However, there is still almost half of the visit experience that remains unexplained. Further research in this area should concentrate on developing and comparing items and dimensions of visit experience satisfaction between different kinds of museums. It may be that an aquarium that focuses heavily on hands-on exhibits and creating strong social experiences will have a similar museum visit experience to a local historical museum with a similar interpretive focus. It may also be the case that two small, local historic museums, one that favors visitor interactions with objects and one that focuses on spoken and written interpretation only, provide very different museum visit experiences. Such research would help to clarify how museums create certain kinds of experiences for visitors, and how museums can change their interpretive practices to offer different or more varied experiences for visitors. Additionally, as a measurement tool for evaluating museum visit experiences, a scale whose items and dimensions are fine-tuned for specific museums types would be invaluable. Certainly, one
all-encompassing scale would capture everything in one giant net, but scales specific to
certain museum experiences would be more efficient to develop, implement and modify as
needed.

Scales that measure visit experience may not conform to the normal typology of
museums, as noted above. There may not be a “zoo scale” or “modern art scale” of
museum visit experiences. The objects of interest in those museums may not be what drives
the visit experiences most. In the instance of this research, a scale found to be effective at a
history museum (and many other kinds of museums) was changed dramatically when applied
at a living history museum. If this is the case, then it may be useful to categorize museums
not only by the effect of the objects in their care, but also to consider categorizing museums
based on the visit experience that they create. It can be imagined that there are experiences
that are hands-on and emotional, or experiences that are hands-off and aesthetic, or
experiences that are cognitive and social. As is demonstrated in this research, drastic
changes in the dimensions of visit experience do not even require changes in the scale items.
It can be supposed that changes in the items may also provide similarly strong changes in the
dimensions of visit experience.

Conclusion

The scale developed by Pekarik, et al (1999) proved reliable for them because the
items on which the scale was based came directly from the visitor experience at those
museums. However, in porting this scale from their location to a different setting, whole
new dimensions of visit experience were uncovered, using the same items. The two new
dimensions that were developed were statistically reliable and valid, indicating that there are
some underlying similarities in visit experience. These new dimensions arrange the aspects of museum visit experience into two kinds of experience: Intrinsic/Emotional and Extrinsic/Cognitive. These items in these dimensions account for 53% of the item variance, and the two-dimension model is a reasonably good predictor of both overall satisfaction and likelihood to return to the museum. However, only three of the individual items predict overall satisfaction and likelihood to return (and only one of those three significantly predicts both), indicating that these dimensions may rely too heavily on just a few significant items. There may be items of the visit experience that are missing from the list, some items which may not be relevant to this setting, and some items which may be similar but not truly the same.

Much research is needed across the many museum types to better understand how visit experience differs across museums. The items developed by Pekarik, Doering, & Karns (1999) provide a strong start, and would benefit from testing at many different locations. It would be useful to be able to fine-tune the items and dimensions that make up visit experience at specific museums. This would create a better understanding of the experiences that museums are currently providing, and help museums adapt to provide other kinds of visit experience, or enhance existing ones.

There are many types of institutions that can be considered under the very large umbrella of, ‘museum’. They share the same care for objects (and living things), they all are interested in the development of new ways of understanding the world, and the dissemination of that knowledge for the greater public interest. However, the experiences that visitors have while in those museums may vary dramatically between museum types. If, as has been shown here, instruments developed to measure visit experience in one museum
are not directly applicable to another, it may also be useful to develop a typology that
considers museums based on the experiences they provide, in addition to the objects they
house. If visitor experience satisfaction is a goal, then a better understanding is needed of
the aspects of visit experiences internal to and between museums.
CHAPTER FIVE
THE EFFECTS OF AN INTERACTIVE PRESENTATION ON VISIT EXPERIENCE SATISFACTION IN A LIVING HISTORY MUSEUM

Introduction

Interactive experiences have become almost ubiquitous in museums (Spock, 2004). However, interactive exhibits in museums are sometimes considered as pertaining only to science and technology museums (Pekarik, 2004). There is very little published research on interactives in living-history or cultural/historic museum settings, even though interaction between visitors, interpreters, and reproduction objects is crucially important for the interpretive process (Funch, 2006, Jackson, 2000).

A difficulty in understanding interactive exhibits and experiences in museums lies in the ability to measure outcomes. While learning outcomes are important (Falk & Dierking, 2000), measuring aspects of visit experience satisfaction can encompass multiple kinds of experiences that arise from interaction (Pekarik, Doering & Karns, 1999). From this information it should be possible to know if reported visit experience satisfaction increases as the interactivity of museum interpretation is increased.

This exploratory research details the outcomes of a quasi-experiment that took place at the Gibbs Museum of Pioneer and Dakotah life, in Falcon Heights, Minnesota in the summer of 2007. This experiment aimed at measuring differences between two versions (treatments) of an interpretive presentation: a spoken treatment and an interactive treatment. The presentation itself was specially created for this research, and integrated as a special summer presentation for museum visitors. The treatments presented the same information, in the same location, by the same presenter, with the only difference being visitor and
interpreter interaction with the interpretive objects. In the spoken version, the interpretive objects were present but were not utilized, and were only for show. In the interactive version, the objects were touched, handled and manipulated by both visitors and the presenter. Adult visitors were asked to fill out a two-page questionnaire at the end of the presentation. The differences between the two treatments were measured on a museum visit experience satisfaction scale (Pekarik, Doering & Karns, 1999).

Literature review

The term interactive denotes a sensory engagement between the visitor and something or someone else. Interactive exhibits or presentations specifically involve at least physical interaction between visitors and objects in a museum setting (Adams, Luke & Moussouri, 2004). There must be feedback to the visitor from the object (or interpreter) in the form of information, be it verbal, tactile, or cognitive. The word itself denotes the creation of action occurring between two actors.

Interactive exhibits have been shown to increase audience diversity, time spent in the exhibit, attracting power, and, importantly, visitor understanding of connections between themes (Davidson, Heald & Hein, 1991). Moscardo’s (1996) Mindfulness Model of Interpretation predicts that, since variety and control contribute most to mindfulness, interactive, participatory, multi-sensory exhibits will be most likely to create mindfulness in visitors.

The benefits of interactives can be framed in terms of their positive effect on learning in museums (Falk, Scott, Dierking, Rennie, & Cohen-Jones, 2004). Overall learning
experiences at museums are positive because of the multi-sensory experiences offered (Falk & Dierking, 1992). The tangibility of interacting with objects, “is a powerful device for sense-making, and thus, understanding” (p. 114). Falk, et al (2004) found that there are four major categories of learning from interactives, which bear a resemblance to Pekarik, Doering and Karns’ 1999 work: knowledge and skills; perspective and awareness; motivations and interests; and social learning.

Creating successful interactive exhibits is not simple, however. Allen and Gutwill (2004) warn against, “five common pitfalls” (p. 199): unintended outcomes; aspects of the exhibit (or visitors) interfering with one another; hands-on to the point that visitors can disrupt the intended outcome; the intended message or theme is obscured by the interaction; and secondary themes become more interesting than the primary theme. Other downsides and difficulties to having interactive exhibits, such as increased cost of design and maintenance, lack of appeal to certain visitors, and visitor-perceived loss of museum quality and reliability when the exhibit does not function properly.

Interactives should be seen as tools that can do specific jobs which can help move the museum along towards its interpretive and experiential goals. “Physical interactivity […] is not a simple and universal prescription for effective learning.” (Allen, 2004, p. 30) Exhibit designers and interpreters must know the purpose of the interactions, the details of how to design the interactive, and must include a strong social element (Adams, Luke & Moussouri, 2004). Like other kinds of museum interpretation, an interactive is just a means to an end, and it must work with, not against, visitor interest and agendas (2004). How effective an interpretive exhibit or presentation is depends not just on the objects or
information in question, but also on the interactions created between the visitor, the exhibit, and the interpreter (Light, 1995; Shettel, 2005).

Interactive exhibits have been considered almost exclusively the realm of science and technology museums (Pekarik, 2004), and most research has occurred in those settings. Though little research has been done into interactivity in living history museums, there are a few notable exceptions. Jackson (2000) discusses the use of participatory theatre as a type of interactive interpretation. Theatre in Education is a roving group that puts on first-person living history presentations, all over the country. Their use of visitor participation creates many opportunities for serendipity, and involves visitors in the debates and decision-making, and therefore the interpretation itself.

Funch (2006) describes an ‘immersive interpretation’ where the visitor, intimately, intensely, and realistically becomes part of a first-person interpretation scheme that re-creates the hardships of being a refugee. “[The level of detail] makes the situation seem horrifyingly realistic. The soldiers, portrayed by professional actors, are dressed in uniforms, carry guns, and confront the visitors in the most direct way” (p. 205). Certainly this experience is not for the interpretive faint of heart, and the museum must believe there is good cause for putting visitors through such a performance. However, the strong emotions and intensity of the experience made an impact. “People interviewed were able to describe in detail what happened to them, and even three or four months later they were able to remember details to an unusual extent.” (p. 210) Visitors also reported very high levels of empathy with the interpretive subject.
Museums are becoming more and more about physical, emotional, and intellectual interactions between visitors, ideas, objects and interpreters, “where neither persons nor things take precedence” (Hein, 2007, p. 77). This interaction is more prevalent at museums than most other educational or cultural institutions (2007). It is not the museums role, necessarily, to fill visitors with information and facts because museums are notoriously slow sources of information, and inefficient compared with places like schools and libraries (Leinhardt & Crowley, 2002). It is the experience of interacting (to whatever degree) with real, authentic objects that gives museums an edge. When visitors can be in contact (even visually) with authentic objects, it makes history more vivid and real. However, visitors must also be considered essential actors in creating the visit experience; without visitors to interact with the objects and interpretation, the authenticity and power of the objects would not exist (Leinhardt & Crowley, 2002).

**Methodology**

Research into interactives has mostly looked at effects on learning (Broad & Weiler, 1998; Falk, et al, 2004). The outcomes of interactives have also been examined for their effects on exhibit accessibility (Davidson, Heald, & Hein, 1991), on the pocketbook of the museum (West, 2004), on the visitor social experience (Adams, Luke & Moussouri, 2004), and on emotional impact, awareness and recall (Funch, 2006). For this research, a measure of the museum visit was sought that would be quite broad in how it looks at visit experience. A scale created by Pekarik, Doering, and Karns (1999) was slightly adapted to this end. The
scale examines very specific items and dimensions that make up museum visit experience satisfaction. Created by asking visitors about the details of their museum visits, the scale contains 14 items which the researchers were then able to factor into four discrete dimensions: Object Experience; Cognitive Experience; Introspective Experience; and Social Experience. The researchers indicated that this scale was tested with a large sample at multiple types of Smithsonian Museums, and proved reliable. The diversity of items, dimensions and Smithsonian Museums in which the scale was tested, lend strong face validity for covering a wide variety of potential museum and presentation experiences.

Table 10: Items and dimensions of museum visit experience satisfaction.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object Experiences</td>
<td>Seeing &quot;the real thing&quot;</td>
</tr>
<tr>
<td></td>
<td>Seeing rare/uncommon/valuable things</td>
</tr>
<tr>
<td></td>
<td>Being moved by beauty</td>
</tr>
<tr>
<td></td>
<td>Thinking what it would be like to own such things</td>
</tr>
<tr>
<td></td>
<td>Continuing my professional development</td>
</tr>
<tr>
<td>Cognitive Experiences</td>
<td>Gaining information or knowledge</td>
</tr>
<tr>
<td></td>
<td>Enriching my understanding</td>
</tr>
<tr>
<td>Introspective Experiences</td>
<td>Imagining other times or places</td>
</tr>
<tr>
<td></td>
<td>Reflecting on the meaning of what I was looking at</td>
</tr>
<tr>
<td></td>
<td>Recalling my travels/childhood experiences/other memories</td>
</tr>
<tr>
<td></td>
<td>Feeling a spiritual connection</td>
</tr>
<tr>
<td></td>
<td>Feeling a sense of belonging or connectedness</td>
</tr>
<tr>
<td>Social Experiences</td>
<td>Spending time with friends/family/other people</td>
</tr>
<tr>
<td></td>
<td>Seeing my children learning new things</td>
</tr>
</tbody>
</table>

Adapted from Pekarik, Doering & Karns, 1999.

This research was conducted at the Gibbs Museum of Pioneer and Dakotah Life over a period of 30 days during the summer of 2007. I had been an employee there in 2005-06, and the management agreed to let me use space in the museum to conduct the research.
Demographics [Appendix F] and initial findings were shared with museum staff. The Gibbs Museum, part of the Ramsey County Historical Society, is located between the Twin Cities of St. Paul and Minneapolis, Minnesota; a relatively urban area. However, the museum is on a nine-acre plot, and it is mostly an open-air museum. The site interprets two main areas of 19th century life in what is now Ramsey County: pioneer life and Dakotah life (the Native American people in central and southern Minnesota at the time). Because the Dakotah area of the museum was my primary responsibility while I worked there, the interpretive presentation was designed to fit in that area of the museum. The learning curve for was less than a pioneer presentation would have been, and the space in the Dakotah area was more suitable and available.

The eventual title for the presentation was, “Corn of the Dakotah.” Since the primary goal of the presentation was to be able to create both a spoken-only and an interactive version, there were a few criteria that influenced the choice of presentation topics. The objects involved must be re-creations, and since the project was initially self-funded the costs had to be low. If the reproduction artifacts were not already available on-site, I had to make them myself. Corn of the Dakotah related how the Dakotah harvested, stored, processed, ate, germinated and planted their corn, and this information was presented in the form of a yearly cycle. [The text that I developed as the factual and conceptual basis for the presentation is Appendix B, below.] I was the only interpreter conducting this presentation, to minimize the number of confounding variables.

In one version (treatment) of the presentation, I gave a purely spoken interpretation, with the reproduction artifacts (such as a wooden mortar and pestle, a leather seed pouch, and grasses and string for making seed germination bundles) visible to the audience. Neither
the visitors nor I physically manipulated the objects. In the other version, the information I
told visitors was the same, as were the objects, the setting, and approximately the amount of
time the presentation took (20-25 minutes). The only thing that changed was that all visitors
were encouraged to use the objects as they were meant to be used. Visitors pounded corn,
helped make seed germination bundles, and were encouraged to handle all the objects. The
presentation itself was created using the best-practice methods and suggestions from the
field of interpretation, such as Ham’s (1992) thematic interpretation, Beck and Cable’s (2002)
Fifteen Guiding Principles of Interpretation, and Brochu and Merriman’s 2002, *Personal
Interpretation*.

The presentation was offered at regular times, four times a day, six days a week, for
thirty days, excluding Mondays when the museum was not open. (For effects of interactive
presentations on the interpreter, see Chapter Six.) Only one treatment was presented per
day, and treatments were randomized across those thirty days. Visitors were informed when
they entered the museum that the presentation was an option for them and were encouraged
to go. Visitors were not told that it was an experiment, nor that there were two versions of
the presentation. At the beginning of the presentation they were simply informed that this
was part of my Master’s Thesis research, and that there was an anonymous questionnaire
that adults (over 18) could fill out at the end of the presentation. Visitors had to fill out the
questionnaire immediately afterwards, and could not take it and give it back later, but were
offered cold bottled water as an incentive.

The questionnaire [Appendix C] had 31 questions and took between five and ten
minutes to complete, with most visitors needing no more than five to seven minutes.
Question 1 asked visitors how much they were able to interact with the interpreter, the
objects on display, and other visitors. Question 2 asked how important it is for visitors to be able to interact with those same three. Questions 3-16 were the items, adapted slightly for readability, and visitors were asked to rate how much the exhibit provided them with the experience in question, with one being not at all and seven being very much. Demographics were also collected, as were ratings of overall satisfaction, likelihood to return, reason for visiting (list adapted from Prentice, Guerin, & McGugan, 1998), and four open-ended questions (see Chapter Three).

**Results**

All quantitative data was encoded in the fall of 2007 for analysis in SPSS statistical software. Sample size was 302 total, with 171 from the interactive presentation and 131 from the spoken presentation. The participation (return) rate was 82%. Analysis of demographics showed no significant difference in demographic make up of respondents between treatment types. According to the results of questions 1 and 2 (*During the presentation, how much were you able to interact with: the presenter; the objects on display; other visitors? How important is it for you, when you visit a museum, to be able to interact with: the presenter; the objects on display; other visitors?*), visitors were significant more likely to respond that they were able to interact with both the objects on display and other visitors. Visitors who received the interactive treatment were significantly more likely to report that it was important for them to interact with both the objects and other visitors. This indicates that visitors are not necessarily expecting to interact with museum objects or other visitors, but when they can, they feel it is an important part of the experience. No significant difference was found in
how much visitors were able to, or how important it was for visitors to interact with the presenter.

In the Pekarik, Doering & Karns article, the authors found four discrete dimensions of visit experience. However, the factor analysis of the items in this research turned up different dimensions. In this case there were found to be two dimensions with an Eigenvalue above a significance of 1. These two new dimensions explained 53% of the item variance, and each had Cronbach’s Alphas greater than .8, indicating a high degree of reliability for these new dimensions. A Pearson’s test showed a positive correlation between the dimensions, indicating good construct validity. A discussion of these new dimensions of museum visit experience can be found in Chapter Four. These two dimensions were named Extrinsic/Object Experience and Intrinsic/Emotional Experience. As these new dimensions had good reliability and construct validity, the analysis of this quasi-experiment was measured based on the fourteen items in two new dimensions.

When ANOVAs were run on the effect of the treatments on the two dimensions of experience satisfaction, no significant differences were found at a 0.05 level. Visitors in both treatments were likely to rate these dimensions equally.

*Table 11: ANOVA of treatments by dimension.*

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intrinsic/Emotional Experience</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>.266</td>
<td>1</td>
<td>.266</td>
<td>.171</td>
<td>.679</td>
</tr>
<tr>
<td>Within Groups</td>
<td>464.927</td>
<td>299</td>
<td>1.555</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>465.194</td>
<td>300</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Extrinsic/Cognitive Experience</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>.999</td>
<td>1</td>
<td>.999</td>
<td>2.196</td>
<td>.139</td>
</tr>
<tr>
<td>Within Groups</td>
<td>136.089</td>
<td>299</td>
<td>.455</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
However, there were two items of experience satisfaction that were positively affected by the interactive treatment (at a significance of .05): ‘I gained knowledge and information’; and ‘I was able to see my children learn new things.’ Both items are from the Extrinsic/Object Experience dimension. As well, (at a moderately significant level of 0.10) visitors in the interactive treatment were more likely to rate the item, ‘the exhibit enriched my understanding’ higher than those in the spoken presentation.

Table 12: Significant differences between treatments by item.

<table>
<thead>
<tr>
<th>Item</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I gained knowledge/ information</td>
<td>4.039</td>
<td>.045</td>
</tr>
<tr>
<td>I was able to see my children learn new things</td>
<td>4.049</td>
<td>.045</td>
</tr>
<tr>
<td>The exhibit enriched my understanding</td>
<td>3.472</td>
<td>.063</td>
</tr>
<tr>
<td>I spent quality time with my family/ friends/ other people</td>
<td>2.017</td>
<td>.157</td>
</tr>
<tr>
<td>I was able to imagine other times or places</td>
<td>1.220</td>
<td>.270</td>
</tr>
<tr>
<td>I felt a spiritual connection</td>
<td>.885</td>
<td>.348</td>
</tr>
<tr>
<td>I was able to see the real/ original thing</td>
<td>.595</td>
<td>.441</td>
</tr>
<tr>
<td>I reflected on the meaning of what I was looking at</td>
<td>.517</td>
<td>.473</td>
</tr>
<tr>
<td>I was moved by beauty</td>
<td>.360</td>
<td>.549</td>
</tr>
<tr>
<td>I thought about what it would be like to own such things</td>
<td>.255</td>
<td>.614</td>
</tr>
<tr>
<td>I saw rare/ uncommon/ valuable things</td>
<td>.128</td>
<td>.721</td>
</tr>
<tr>
<td>I was able to continue my professional development</td>
<td>.069</td>
<td>.792</td>
</tr>
<tr>
<td>I recalled my travels/ childhood memories/ other experiences</td>
<td>.040</td>
<td>.842</td>
</tr>
<tr>
<td>I felt a sense of belonging or connectedness</td>
<td>.038</td>
<td>.845</td>
</tr>
</tbody>
</table>

The interactive treatment was also not shown to have a significant effect on either overall satisfaction or visitors’ reported likelihood to return. Nor was there a significant difference between treatments based on any of the demographics collected.
Discussion and Suggestions for Future Research

The major finding is that there was no statistically significant difference in the means of the two treatments when measured against the two dimensions of experience satisfaction. This finding, in the context of a historic and living history museum, can be interpreted in several ways. It may simply be that interactive presentations do not have a significant effect on museum visit experience satisfaction when compared to spoken presentations. This would indicate that interactives, which can be more expensive and more time consuming to develop and implement, are simply not worth the effort, when a similar level of visit experience satisfaction can be produced through verbal presentation styles. However, this contrasts sharply with the prevailing literature (Davidson, Heald & Hein, 1991; Falk, et al, 2004; Falk & Dierking, 1992; Moscardo, 1996). A look at limitations of this study reveals potential reasons for this lack of difference, and suggests valuable lessons for designing future research into museum interactives.

Though there was no significant difference between treatments based on the overall dimensions, there were several items that did see a change between the spoken and interactive treatments. Respondents in the interactive presentation were significantly more likely to state that they gained knowledge and information, and moderately more likely to report that the interactive presentation enriched their understanding. Respondents in the interactive presentation were also significantly more likely to report that they saw their children learn new things. This last item is important because all respondents were adults. Demographics show that the majority of adults brought children with them. It was observed, during the presentation [see Chapter Six] that adults were much more reticent to participate in the presentation’s hands-on activities than children were, especially when they
had to stand up or move much. To get adults to participate required significant effort on the part of the presenter. As Falk and Dierking (1992) note, many adults come to museums for their children, not necessarily because of their own interest. This may indicate that a way to measure adults and children’s visit experience satisfaction needs to be developed to fully understand the visit experience both have while in the museum. The experience satisfaction of one is tied to the other.

Other aspects of the scale may be responsible for this lack of difference between treatments. The dramatic change in the dimensions of visit experience indicates that a scale developed in one museum setting may not be directly applicable to another. Visit experience may be different between museums. For this reason, this scale may not have been able to detect differences between the spoken and interactive presentations. There may be extraneous items in this scale, and there is at least one aspect of the Gibbs Museum experience missing from the item list: there are no items on the scale that address physical interaction with objects.

Only two items were shown to be significantly and positively affected by the interactive treatment, and one item, moderately. Specifically, the interactive presentation made it more likely for visitors to say they saw their children learning, and that they gained knowledge, information and understanding. It was a positive effect, but these individual items were not enough to influence the entire scale of visit experience satisfaction. It may be the case that interactive presentations and exhibits have only specific, specialized effects on overall visit experience satisfaction.

As well, there may have not been enough difference between the two treatments; the interactive presentation may not have been interactive enough. The presentation was
designed as a quasi-experiment, which meant minimizing variables so that the only
difference would be whether visitors could interact or not. This may have constrained
interactivity to the point where the presentation was not as interactive as it would have been,
were it designed to stand alone. Similarly, visitors could voluntarily participate in the
interactive presentation, but adults were more reticent to participate, especially when there
were many children interested in using the objects. The interactive presentation may not
have done enough to encourage visitors to interact with the objects, especially the adults.
One solution would be to develop an interactive version of a presentation that does not ask
participants to interact with the objects, but instead assigns age-specific tasks in a setting
designed around enhancing interactivity, not around modifying a spoken presentation.

Though the Pekarik, Doering & Karns (1999) article does discuss the use of the scale
to measure specific exhibitions, these are not the same as individual exhibits or
presentations. The scale was developed to measure museum visit experience satisfaction,
not exhibit experience satisfaction. As has been shown here, the scale is effective in
accounting for significant amounts of visitor overall satisfaction, as well as their stated
likelihood to return. However, the scale was applied to one exhibit only for this research.
The items may be too broad and too general to measure effects of individual exhibits, or the
individual presentation is not large enough a factor in the overall visit experience to register
on this scale, with these dimensions. The scale may, in fact, have measured more than just
the parts of the experience that can be found in one presentation. This would prevent the
lesser effects of the individual presentation from being clearly recognized amidst the effects
of the overall visit experience.
It may also be that the failure of the interactive treatment to have significant effects on the dimensions of visit experience satisfaction results from a combination of the preceding possibilities. Ideally, then, the next step would be to design another quasi-experiment with an even stronger interactive treatment, using a measurement scale appropriate for individual presentations in living history museums. This could have much different results. However, there are three hurdles to this approach that would require further research.

First, the researcher must somehow ensure that very disparate treatments are actually comparable. Even if the basic script for both treatments remains the same, it may be possible that comparing purely spoken presentations to highly immersive, interactive ones is not commensurable. It might be like comparing apples to pineapples: similar in name but drastically different in many ways.

Second, there needs to be a better understanding of the roles that individual exhibits and presentations play as part of the overall museum visit experience. It may turn out that this scale is not appropriate for measuring the outcomes of single exhibits.

Third, it would be necessary to study how items and dimensions that make up visit experience satisfaction differ between types of museums. As may be the case in this research, the differences may be significant enough that scales developed for one environment may not be appropriate in another.

Conclusion

For certain aspects of museum visit experience satisfaction, such as visitors seeing their children learn new things, and increasing reported gain of knowledge and
understanding, we can reasonably say that the interactive treatment made a positive
difference in this case. This is not to say that in all situations interactive presentations will or
will not have these effects, or others. This research tested only one presentation in one kind
of museum. What we can say is that interactive presentations appear to have a positive
effect on certain aspects of adult visit experience satisfaction in this living history museum,
including seeing their children learn new things, knowledge and information gained, and
moderately, increasing visitor understanding. These are important, but do not indicate that
interactivity affects the broader dimensions of visit experience satisfaction.

We may not, however, have a full understanding of the specific items that make up
(or do not make up) the visit experience at living history museums (see Chapter Four). To
be able to fully measure the effects of interactive presentations, or any other kinds of
exhibits, we need to develop a better understanding of the kinds of experiences visitors have
at living history museums, their relative importance, and how aspects of experience differ
among different kinds of visitors. Especially important would be research with young
visitors, a large important segment of the museum population that has not been addressed
with this scale.

Interactive interpretation holds promise for increasing visit experience satisfaction
and potentially repeat visitation. If we are to fine-tune visitor experience to ensure that
different kinds of exhibits and presentations are delivering the appropriate aspects of the
visit experience spectrum, we need to better know how visit experience satisfaction
functions between exhibits, inside the individual museum, and differs among types of
museums. This quasi-experiment gives some indication that interactives can have a positive
effect on visit experience, but exactly how, how much, and why is not certain. To better
measure the outcomes of interactives in living history museums, more research is required into how visit experiences differs between museum types, and how exhibits contribute to overall visit experience.
CHAPTER SIX

FIELD NOTES AND OBSERVATIONS FROM THE CREATION OF AN INTERACTIVE PRESENTATION AT A LIVING HISTORY MUSEUM

Introduction

During the summer of 2007 a special presentation was offered to visitors at the Gibbs Museum of Pioneer and Dakotah Life, in Falcon Heights, Minnesota. The interpreter-led presentation was entitled, “Corn of the Dakotah,” and explored the relationship between the Dakotah-speaking peoples of the early 19th century and the corn that they grew and consumed. The presentation lasted twenty minutes and occurred four times a day, every day the museum was open, for thirty days. Adult visitors were asked to fill out a five-minute questionnaire at the end of the presentation.

What visitors were not told is that they were seeing only one version of the presentation. Two versions were developed as part of my Master’s Thesis research, and formed the basis of a quasi-experiment to test the difference between a ‘spoken-only’ presentation and an ‘interactive’ presentation. The two versions were essentially the same, except in the interactive version visitors were encouraged to use the objects. In the spoken version visitors could only look at the objects. A questionnaire measured the differences in visit experience satisfaction (see Pekarik et al, 1999).

During the thirty days the research was conducted I was also able to collect field notes and observational data that led to a number of interesting lessons regarding the difficulty, the efficacy, and benefits of developing and implementing interactive interpretation for visitors. This article presents two major lessons learned from this research.
1. Encouraging visitor participation

1.1 Adults won’t compete with kids

Children were much more likely to be interested at the prospect of hands-on interaction than adults; though when kids were interested, usually adults were too, by proxy. Once at the presentation, it was sometimes an effort to get adult visitors to participate during the interactive version. Children (younger than teenagers) gladly got up and used the objects in question, which should not come as a surprise (Falk & Dierking, 1992). However, only adults could fill out the questionnaire. I had to work hard to make sure adults were participating. Adults may, in part, be socially conditioned not to touch things in museums (1992), but during these interactive presentations, adults always waited for kids to go first, and moved right out of the way if there was a child waiting. It seems that the adults did not want to take away an opportunity from a child. A solution could be to create age-exclusive presentations, or more reasonably, design age- and gender-specific tasks as part of interactive cultural presentations.

1.2 Make the presentation space appropriate

The layout of the presentation space (visitors sat on benches facing me, shaded by trees) turned out to be a great format for the spoken version, but during the interactive version adult visitors seemed reluctant to get up from their seats to participate. A less formal space, perhaps inside a replica structure might have been more conducive to participation. Incorporating age-specific interactives would likely also better inform the design of the presentation space.

1.3 The right ratio of interactive objects to visitors
The ratio of objects to visitors varied wildly between presentations because audience size was uncontrolled. Some presentations had two visitors, some had thirty. With larger groups, there were often not enough interactive objects. Offering a limited number of tickets to each presentation might increase desirability, as well as maintain the number of visitors at the presentation at a relatively optimal amount.

1.4 Effectiveness based on group size

Up to ten visitors seemed optimal for encouraging interactive participation. Less than five visitors was fine for interactives, but these small groups presented difficulties for the spoken version. When group size is very small there seems to be an expectation among visitors that they should receive a more personal presentation, and get to use or at least touch the reproduction objects. For these reasons, expected group size should also inform the choice of how interactive a presentation should be.

1.5 Younger visitors can encourage adult participation

Getting adults to participate was easiest and most effective through their children. With small children I always requested an adult assist them. Adults also could pay better attention and interact when their children were thoroughly engaged with the presentation. When adults don’t have to worry about what their kids are doing (adults come to museums for their kids, anyway (Falk & Dierking, 1992)), they are free to engage with the interpreter and the presentation. For this reason, with groups that had several small children, I spoke so that the children could understand. As long as I also made an effort to engage the adults, they accepted what I was doing and why. It seemed that, if the information in the presentation was interesting, relevant and novel, how it was presented wasn’t as important.
2: Impacts on the interpreter

2.1 Depth of interpreter experience

I enjoyed my time much more during interactive presentations. If I could do only the spoken for a few days in a row (one version per day, days were randomized), I found myself longing for the depth of interaction between myself and the audience that manipulating the objects allowed. Not handling the objects during the spoken-only version was also quite a challenge for me. I had to constantly remind myself not to, even though I instinctively reached out to handle the objects. It felt awkward not to. On some of the spoken presentation days, I felt like I wasn’t giving visitors a complete presentation, even though I was giving it my all.

2.2 Interpreter burn-out

Burn-out from repetition began somewhere around the end of the third week, but the impact of the burn-out was more severe for the spoken-only version. The interactive version provided me a greater range of sensory stimuli, and has the ability to create valuable moments of novelty and serendipity (Jackson, 2000) which can positively affect both the visitor and interpreter.

Conclusion

Certainly there were upsides to doing a purely spoken interpretation: easier and cheaper to develop; easier setup and clean up; simpler to enact and repeat; and generally takes less time to present. However, in many cases, the overall benefit of interactives, especially where families with children are involved, seems to make it worth the extra time and effort, not only for visitors but for the interpreter as well.
CHAPTER SEVEN
CONCLUSIONS

Limitations of the Research

As this research only sampled from one museum, the results here, though they may be interesting or useful for other similar institutions in conducting their own research, can not be considered generalizable to them.

Though this research did collect its target sample numbers (250-300), the population for the study is only adult museum visitors to the Gibbs Museum. The Gibbs Museum has a major portion of its visitation as school groups and families with children under 18 years old. As this research did not administer a questionnaire to visitors under 18 nor to any school groups, there is a major part of the museum population which is not accounted for in this study. This younger part of the museum visit population may have significant different experiences than the adult visitor, and therefore represents a gap in the understanding of museum visit experience for all visitors. At the very least, children affect the experience of adults, and vice versa. To understand visit experience of one requires an understanding of the visit experience of the other.

The experiment itself, as it lacked a control group (to which no treatment was applied), and because participants in the group were not randomized (visitors chose to come to the presentation and all adult visitors were asked to fill out a questionnaire) cannot be considered a true experiment. However, this caveat does not detract from the reliability or validity of the experiment.
Recommendations for Future Research

While these are not limitations inherent in the creation of this research, there were certain issues that arose in the application of the research that are relevant to its outcomes and to informing future research in this area.

Most outstanding is the change in dimensions from the original four in the Perkarik, Doering & Karns (1999) article, to the two found in this research. What would be most useful to understanding museum visit experiences, as well as differences in experience between museums, would be to apply an empirical research formula, similar to the Pekarik, et al. article, to many different kinds of museums. A comparison of both the aspects (items) and the dimensions of museum visit experience across many kinds of museums would create a better understanding of the experiences available at different museums. This could also help explain which kinds of museums and exhibits create certain experiences, and why.

Another way to better understand museum experience would be to understand how the key elements, or actors, in a museum work together to create that experience. Do individual actors create certain aspects of the visit experience, and together create a full complement of museum visit experience aspects? Or do individual actors each create a percent of all the aspects of museum experience, and together the actors create 100% of the experience? One way to explore these questions would be to test individual exhibits, presentations or tours, with a scale created for that type of museum, to see how each exhibit contributes to the overall visit experience. It would seem reasonable that if certain exhibits only provide certain aspects of the visit experience, then the former question would be the case. If each exhibit provides many or all of the aspects of the experience, then the latter
question would be more correct. Based on the research conducted for this thesis, it may be hypothesized that individual exhibits only provide certain aspects of visit experience.

Both visitor responses to the four open-ended questions and the new dimensions of might also benefit from a re-coding based on communication models and theories such as the Elaboration Likelihood Model (ELM). This model was designed to consider how people adopt opinions or change their minds as a response to persuasive communication through two potential channels: a central route which involves reason and cognition; and a peripheral route which involves creating emotional associations with a subject (Petty, Kasmer, Haughtvedt & Cacioppo, 1987). The central route is considered to have a stronger, longer lasting effect, while the peripheral route is considered less strong and less permanent in its effects (1987). The similarities between these two routes and the Extrinsic/Object and Intrinsic/Emotional Experience dimensions deserve greater analytic attention.

Future research would also be useful in understanding why and when visitors want to participate in interactive exhibits at living history museums. Testing and comparison of outcomes from interpretive designs, such as age-specific tasks, could provide answers as to what causes visitors to participate, or not.

Understanding interaction and experiences in museums must also include the effects on, and the roles that children play. They represent a large portion of the visitation, and therefore scales must be designed that take into account children’s expectations, their actions and how they respond to certain kinds of exhibits as well as aspects of museum visit experience.

Finally, a re-test of the efficacy of interactive presentations compared to spoken presentations is warranted. However, appropriate measurement scales would need to be in
place. To create those appropriate scales, a better understanding of the roles of exhibits, children, adults and interactivity in museums would be very needed. A re-test of this experiment would hopefully have the following characteristics: a very clear and dramatic difference in the interactivity between treatments; a design that ensures the participation of adults and children; a scale of exhibit or presentation experience as part of the overall visit experience; and an understanding of the role of the presentation as affecting and affected by overall experience.

Conclusion

The purpose of the research in this thesis was to shed new light on the interactions between humans and objects in a living history museum, and how those interactions affect visit experience. In doing so, three main research questions were examined: Does visitor interaction with interpretive, museum objects increase visit experience satisfaction; Is a scale that measures visit experience satisfaction well, in one museum setting, applicable and transferable to another type of museum; What can visitors tell us about how they understand, empathize with, and learn about other cultures in a living history museum?

The ontological framework of Actor-Network Theory gives a reason for studying these interactions. Reality itself, including cultures and societies, is an effect of the interactions of heterogeneous actors, including humans and objects (Law, 1992). For this reason, the interpretation of those past networks must be concerned with how the actors and their interactions are substituted, represented and interpreted. The visitor experience is then also an effect of interactions between represented actor-networks and current ones.
The visitor agenda and interests are as important as the interpretation of the objects in creating this experience (Falk & Dierking, 2000).

To know the success and efficacy of an interactive visitor experience requires a way to accurately measure that experience. This research was an attempt to measure that experience. At the center of the research was the creation of a presentation and its two treatments: one interactive and one spoken-only. It was hypothesized that the interactive presentation would have a statistically significant, positive effect on visit experience, greater than the spoken-only presentation. To measure visit experience, a museum visit experience satisfaction scale (Pekarik, et al, 1999) was adapted, and from this scale came another major research question: was this scale actually applicable and valid in this setting? Would this scale, developed at Smithsonian Institutions actually reflect the aspects of visit experience at a small, living history museum? The answer was possibly not. The failure of the 14 items of the scale to factor into the same kinds of dimensions as in the original setting indicates that visitors are having different experiences in the Gibbs Museum than in Smithsonian Institution museums. This difference in experience may be because of the setting of the museum and types of interpretation. It may be because visitors have different expectations of the visit experience, or because there is altogether a different kind of visitor to the Gibbs museum. Likely, the difference in experience is an effect of many causes, including those listed and likely others that are hidden.

A tool that measures the outcomes of the visit experience must accurately reflect the experiences that occur in the museum, as well as the experiences that are expected to occur. Measuring the visit experience requires an understanding of how the experience is created and what affects the outcomes. The question is, is visit experience so different between
museums that each location requires a novel measurement scale for visit experience? More likely, there are similarities in museum visit experience between museums, but what is the basis for these similarities? Most museums are classified by the kinds of objects that are displayed in them (Falk & Dierking, 1992) or by their target audiences (children’s museums) and not necessarily by the experiences that occur within them. It could prove very useful to compare aspects of visit experience between many kinds of similar and dissimilar museums. This could show not only how and which museums have similar visit experiences but also what it is that museums are doing to create certain types of experiences.

Human/object interactions and the experiences that they create are essential parts not only of museum visit experience, but how our culture, our societies and our realities are created, sustained and changed. When museums collect, care for and interpret those objects for visitors, it must be recognized that those objects have an effect on the visitors. They are not just empty vessels to be filled with social meaning (Latour, 2005). By virtue of their physical properties, they act upon and affect human existence. This process of interaction between many heterogeneous actors must be recognized not only as having affected the object in its original environment, but also that the object is part of, and affects the actor-network of the museum.
Appendix A

Participant informational form

Information Concerning Participation in a Research Study
Clemson University

Interaction in Museums and Visitor Experience Satisfaction

Description of the research and your participation
You are invited to participate in a research study conducted by John Fino and Dr. Ken Backman of Clemson University and the Gibbs Museum of Pioneer and Dakota Life. The purpose of this research is to understand how visitors react to museum exhibits, as well as aid the museum in better understand its visitors and their interests. Your participation involves filling out a questionnaire, which should take about 4 minutes.

Risks and discomforts
There are no known risks associated with this research.

Protection of confidentiality
This questionnaire is entirely anonymous. We are not collecting any personal information like as names, addresses or phone numbers that could be used to associate you with your questionnaire. When you finish the questionnaire, you can fill out a raffle slip to be entered to win a year-long, family museum membership or a gift certificate to Amazon.com. This information is entirely separate from the questionnaire and will not be used at any time in this study.

Potential benefits
Filling out this questionnaire will help us to improve museum service to you and all our visitors. We would like to make your museum experiences as interesting and enjoyable as possible.

Voluntary participation
Your participation in this research study is voluntary. You may choose not to participate and you may withdraw your consent to participate at any time. You will not be penalized in any way should you decide not to participate or to withdraw from this study.

Contact information
If you have any questions or concerns about this study or if any problems arise, please contact Dr. Ken Backman, at Clemson University at (864) 656-2204. If you have any questions or concerns about your rights as a research participant, please contact the Clemson University Office of Research Compliance at (864) 656-6460.
Appendix B

Information Used in Interpretive Presentation

This exhibit will discuss the relationships the Dakotah had with their corn that helped make the transition from spring to summer harvesting successful.

We will discuss the storage of corn, how the stored corn from the previous year was cared for to ensure a proper harvest, and how this stored corn could be processed for food.

The Relationships:

The Dakotah women had a relationship to the plants and animals around them, including the corn they planted. You can't just stick some corn in the ground whenever and expect to get more corn sometime later. Corn has many specific needs to make it produce more corn, and the women had to understand those needs well. If the Dakotah women had effective relationships with the corn, the earth, the weather and wild animals, this would help insure a good harvest to ensure a good harvest.

However, having a good harvest doesn't mean there will be food year-round when the harvest is done. The Dakotah relationships with their corn extended beyond just planting and harvesting. The women had to knowing how the corn needed to be stored, ground, and then prepared for planting extremely important to ensure a successful, yearly cycle of corn.

The period of the yearly cycle:

The time of year we're concerned with in this presentation is from the first moon (Magaokata wi, or Watopapi wi– the moon when the geese lay eggs, or the moon where the rivers are navigable) of spring (Wetu) until the corn harvest moon (Wasuton wi) of Summer
(Mdoketu), about April until August on our calendar. (There are 29.5 days to a lunar cycle.)

This can be a period of much movement, as the Dakotah lived in tents during the winter, following the deer and hunting muskrat.

**Storing the corn:**

From the previous corn harvest moon, the Dakotah women have dried and saved the extra corn, and placed it in pits, probably stored in bark barrels, in the ground. Other Native American groups had other ways of storing corn and other seeds and foods like dried meat for the winter, but it seems that during the 1800's the Dakotah were using bark barrels.

The Dakotah would store their corn in tight bark barrels, buried in the ground.

(Here present the small barrel and corn in ground.) Other tribes built similar storage pits out of different materials, some pits deep enough to need a ladder to enter down into them.

(Remove some dried corn.) Another excellent way to store corn is in pouches made of leather, rawhide or the bladders or stomach of large animals. Then, one person would be responsible for the safe keeping of the corn and carrying it when it was time to move the tipis. These pouches were usually for taking care of the seed corn.

This stored corn was important for two important reasons.

**Reasons for storing corn:**

First reason: To eat

As the long winter season worn on, the earth provided less and less food for both the Dakota and the other animals who needed to eat. There would be very few edible plants to collect until the plants matured during the springtime. It was common for both the Dakotah and the animals they hunted to become a little leaner as the winter wore on. Some
winters were very severe, and there could be starvation. Other winters were milder and more comfortable for everyone.

Over the long winter period and during the early spring hunting there were fewer animals to hunt, and the animals were leaner. Deer and muskrats were common animals for the Dakotah to hunt, but muskrats are not as large as deer and so did not provide as much meat. Occasionally a buffalo might be killed in the winter, but weren’t as easily found.

The stored corn was extremely important as an extra food source to help the Dakotah through the winter and spring, and even into the summertime, before the summer harvest of corn.

Processing the corn: Eating raw, whole, dried corn isn’t the most enjoyable thing. It’s hard, it’s dry, and it’s raw. Dakotah women, who were responsible for knowing how to properly store the corn, also had to be very good at making the corn tasty to eat. The dried corn was pounded into meal and added to stews, to make gummy corn, which is like pemmican: mashed boiled corn mixed with dried meat, dried berries.

Kinds of corn: There were four kinds of corn the Dakotah grew, (names in Dakotah?) known today as Flint, Dent, Flour and Sweetcorn. Dent and Flint corn were the hardest and lasted the longest (even good for planting up to a decade later!), with kernels a little like popcorn. Flour was the quickest to grind, best for soups and stews, but didn’t last as long as the other two kinds (maybe a year or two). Sweetcorn was the quickest growing though, and sweetest, as you can tell from the name. It made for good eating both green as well as ripe, and for making gummy corn.

Tools for grinding corn: The tools used by the Dakota to grind corn were most likely the mortar and pestle, like many of the groups of Native Americas who lived in the
forest areas to the east and south. Corn in many other places on the continent was ground using a stone mano and metate, and the Ojibwa to the north may have used these (describe the manos and metates). But probably the Dakotah preferred to use a mortar and pestle made of wood or stone to pound their corn into flours and mashes. Mortars pestles, especially the smaller stone ones would be used to grind up medicinal plants into fine powders and pastes. These mortars and pestles came in many sizes, some small and portable that were easy to carry around when moving a lot, some large that were good for summertime and pounding a lot of corn. What are the benefits and downsides to using one material or another? Why not only wood or only stone? (Fish for a few answers.) Stone is harder and makes grinding easier, and finer meal, but stone is heavy (less portable), harder to make very large (for grinding lots of corn at once) and little bits of stone can chip off which can make eating painful and wear down your teeth over time. Wood is lighter, easier to shape to how you want your mortar and pestle, and it can be made very large without being impossible to move. Being very large means you can use a lot more force with the pestle, can do more corn at a time, it will go faster, and will grind the corn more easily. However, wood is much softer, it takes longer to pound (when small), and you cannot actually grind the corn with it, which limits how fine the corn can get.

Second Reason: Seed

But not all the corn would be eaten. The other extremely important reason for storing corn from the previous year is to be able to plant the next year. The very best kernels were sorted out and saved for planting to ensure that there would be seeds to plant in the late spring. When it came time for planting the corn (they knew it was time because the corn planting moon is also the moon when the first wild strawberries come out), the
Dakotah women wanted to make sure the plants had the best start possible, so they would sprout the corn using hay (tall grasses), water, and sunshine. (Have a few sprouted corn on hand. Do a bundle of corn to sprout as soon as you get to Gibbs.) They would lay out a layer of hay, put the corn on top, sprinkle the corn with warm water, and then another lay of hay, bind it up and leave it in a safe, sunny place for warmth. They sometimes wrapped the hay/corn bundle it in leather pouches to keep the warmth in. The sun and the moisture will allow the corn to sprout. While waiting for the corn to sprout, the women would prepare their gardens for planting. After 7 to 14 days, the fields were readied and the corn would be sprouted. Any unspouted corn was not going to grow, and so you wouldn’t plant it. Corn was planted in small mounds (as you saw at the Dakotah garden) and four plants were planted in each mound.

Conclusion:

Dakotah women competed to see who had the best corn field. A pest-free, healthy garden that produced lots of good corn was proof to everyone that the woman understood the needs of the corn, and developed excellent relationships to deal with the earth, the sky and the animals that would affect her garden. A good harvest, with lots of dried corn left over for the winter, would certainly go a long way to raising her standing in the community.

If the woman had been intelligent, responsible and resourceful, she would have had stored the corn properly to keep it safe, picked the best kernels that would produce the best plants, and cleared the field well and kept it clear of other, unwanted plants. The final step, before the first hill was planted, was to raise her hoe to the sky and ask the Great Spirit to bless her field and give her a good growing season. Then in the first hill she would plant four kernels, one in each cardinal direction, North, South, East and West. This asks the
Great Spirit for good summer rain and sunshine. Having worked very hard to do all these things properly, with some good fortune from the Great Spirit in the form of good weather, she would have a good crop that year, and enough food for the long winter and spring to come.

Sources: Buffalo Bird Woman, 1994; Gibbs Farm Museum, 1997; McLaughlin, 1999; Minnesota Geological Survey, 2004; Pond, 1986; Prindle, 1994; Red Elk (personal communication, June 2007.)
Appendix C

Questionnaire

The Effects of Human/Object Interaction on Museum Visit Experience Satisfaction

By

The Gibbs Museum of Pioneer and Dakotah Life and
The Department of Parks, Recreation and Tourism Management
The Effects of Human/Object Interaction on Museum Visit Experience Satisfaction

Based on the presentation you just saw, please answer the following questions to the best of your ability. Using a scale of 1 to 7 where 1 is “not at all” and 7 is “very much.” (Please circle only one number.)

1. During the presentation, how much were you able to interact with:
   - The presenter
   - The objects on display
   - Other visitors

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

2. How important for you is it, when you visit a museum, that you can interact with:
   - The presenter
   - The objects on display
   - Other visitors

<table>
<thead>
<tr>
<th>Not at all Important</th>
<th>Very Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Please tell us about your experience with the exhibit, “Corn of the Dakotah.” On a scale of 1 to 7 where 1 is “not at all” and 7 is “very much,” how well did the exhibit provide you with the following experiences? (Please circle only one number per item.)

During the exhibit “Corn of the Dakotah”:
   - I recalled my travels/childhood memories/other experiences
   - The exhibit enriched my understanding
   - I felt a sense of belonging or connectedness
   - I was able to see my children learn new things
   - I gained knowledge/information
   - I saw rare/uncommon/valuable things
   - I reflected on the meaning of what I was looking at
   - I was able to imagine other times or places
   - I thought about what it would be like to own such things
   - I felt a spiritual connection
   - I was moved by beauty
   - I spent quality time with my family/friends/other people
   - I was able to continue my professional development
   - I was able to see the original: real thing

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
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</tbody>
</table>

17. How many people in your group today are under 18 years old? (Please check one.)
   - 0
   - 2
   - 3
   - 4
   - 5+

18. How would you best describe the group you are with today? (Please check one.)
   - Individuals
   - Couple
   - Group of friends
   - Family
   - Other (please specify)

19. Where did you come from to visit the museum today?
   - Twin Cities metro area
   - Minnesota (outside the Twin Cities)
   - Other US State
   - International (please specify state or nation)

   b. Your home zip code is: ________________________________

20. Please indicate your age:
   - Male
   - Female

21. Please indicate your gender:

22. What is your current level of formal education?
   - High school degree or GED
   - Associate Degree
   - Undergraduate Degree
   - Graduate Degree
23. What was your primary source for finding out about the Gibbs Museum? *(Please check one item)*

- [ ] Friend/ family
- [ ] Drove by
- [ ] Internet
- [ ] Guidebook
- [ ] Flyer
- [ ] Library pass
- [ ] Other (please specify)

24. What is your primary reason for visiting the museum today? *(Please check only one item)*

- [ ] Family outing
- [ ] On vacation
- [ ] To learn
- [ ] Accompanying someone else
- [ ] To bring visitors to the museum
- [ ] Interested in Minnesota Pioneer history
- [ ] Interested in Native American history
- [ ] Change of pace/ see something new

25. Did you come here today with a MELSA Library Museum Pass?  
- [ ] Yes
- [ ] No

26. On a scale of 1 to 10 where 1 is “not at all satisfied” and 10 is “completely satisfied” please rate your overall satisfaction with your visit today. *(Please circle only one number)*

<table>
<thead>
<tr>
<th>Not at all Satisfied</th>
<th>Completely Satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
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</tbody>
</table>

27. On a scale of 1 to 10, where 1 is “not at all” and 10 is “definitely”, how likely are you to return to the Gibbs museum in the near future?

<table>
<thead>
<tr>
<th>Not at All</th>
<th>Definitely</th>
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<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
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</table>

28. Please help us improve our services to you, our visitor. What can we do to make you more likely to visit the Gibbs Museum again?

________________________________________________________________________________________

One of our main goals at the Gibbs Museum is to enable visitors to understand what life was like for the Dakotah.

29. During your visit today, what most helped you to think about life from a Dakotah point of view? Why do you think it was effective?

________________________________________________________________________________________

________________________________________________________________________________________

30. If you could change, take away, or add anything (or many things) to the museum to help our visitors to understand the Dakotah, what would it (they) be? Why?

________________________________________________________________________________________

________________________________________________________________________________________

31. If you could ask a Dakotah from the year 1820 anything about his or her life, what would you most like to know?

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

Thank you for taking the time to participate in this survey!
Appendix D

Categories and themes from questions #28-31

**Question #28** “Please help us to improve our services to you, our visitor. What can we do to make you more likely to visit the Gibbs Museum again?”

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<tr>
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<td>(36)</td>
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<td>More interpretive signs, tours, guides (7)</td>
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<td>More/other animals (3)</td>
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<td>Interaction</td>
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<td>More hands-on (10)</td>
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<td>(15)</td>
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<td>Better/more/continued interaction between guides and visitors (5)</td>
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<td>Continue with/ have more child-friendly exhibits/presentations etc. (10)</td>
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<td>Visibility / Communication</td>
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<td>Food (1)</td>
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Question #29: During your visit today, what most helped you think about life from a Dakotah point of view? Why do you think it was effective?

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<td>Presenter/guide (45)</td>
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<td>I was asked questions (4)</td>
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Question #30: If you could change, add or take away anything to help visitors better understand the life of the Dakotah, what would it be?

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Authenticity (11)  
Non-personal interpretation (4)  
Displays/ signs (4)
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<td>? (5)</td>
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**Question #31:** “If you could ask a Dakotah from the year 1820 anything about his or her life, what would you most like to know?”

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<td>How to make (other things)</td>
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Appendix E

Regression coefficients and correlations for the two new dimensions

Dependent Variable: Please rate your overall satisfaction with your visit today.

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Dependent Variable: How likely are you to return to the Gibbs museum in the near future?

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Correlations

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<tr>
<td>Sum of Squares and Cross-products</td>
<td>135.933</td>
<td>137.089</td>
</tr>
<tr>
<td>Covariance</td>
<td>.453</td>
<td>.457</td>
</tr>
<tr>
<td>N</td>
<td>301</td>
<td>301</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
Appendix F

Demographics of the sample

Question #17: How many people in your group today are under 18 years old?

Question #18: How would you be describe the group you are with today?
Question #19: Where did you come from to visit the museum today?

[Bar chart showing the percentage of visitors from different locations.]

Question #20: Please indicate your age.

[Histogram showing the frequency distribution of ages with a peak at age 70.]

(The highest peak represents about 5% of the total sample.)
Question #22: What is your current level of formal education?

![Bar chart showing the distribution of formal education levels.](image)

Question #23: What was your primary source for finding out about the Gibbs Museum?

![Bar chart showing the distribution of primary sources.](image)
Question #24: What is your primary reason for visiting the museum today?

Question #26: Overall satisfaction (Scale of 1-10)
Question #27: Likelihood to return (Scale of 1-10)
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