LEARNING IN CONTEXT: EXPLORING SHORT- AND LONG-TERM EXPERIENCES SITUATED IN AN INFORMAL LEARNING ENVIRONMENT

by

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(Under the Direction of Janette R. Hill)

ABSTRACT

Context plays an important role in any learning situation. Falk and Dierking's (2000) Contextual Model of Learning (CML) was conceived as a framework through which to look at the complexities of learning through interactions between personal, social, and physical contexts over time.

The purpose of this study was to explore the role of *personal*, *sociocultural*, *and physical contexts* on the short- and long-term perceptions and learning of adult participants in a natural, informal learning environment. This study used a qualitative embedded case study design. Data were collected using a background questionnaire, interviews, and participant observation. Small groups of adult passengers on a whale-watching boat were interviewed immediately before and immediately after a whale-watching trip, and again six months later to determine if the experience as a whole, along with the on-board educational program, had any effects on perceptions and learning. The CML served as a framework for this research, considering personal context (including motivations and expectations; prior knowledge, interests, and beliefs; and choice and control), sociocultural context (interactions with companions and other visitors,

as well as with facilitators), and the physical context (with considerations for comfort, safety, as well as the designed and natural experience).

Findings suggest that these contexts, both separately and together, played an important role in how the participants perceived the experience, and the learning that happened as a result of the experience. Further, the findings indicate that subsequent reinforcing events are critical for learning and elaboration to happen over time. This study contributes to the small but growing literature that focuses on context and adult learners in informal environments over a period of time.

INDEX WORDS: informal learning, free-choice learning, Contextual Model of Learning, situated learning, whale-watching, short-term, long-term, qualitative research

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DEDICATION

To my husband, Dave, and my daughters, Roxanne and Lucille. With love.

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CHAPTER ONE: INTRODUCTION

Introduction

Learning happens everywhere that you find people: at home, at work, in cafeterias, Internet chat rooms, parks, playgrounds, museums, and leisure environments (Coffield, 2000; Eraut, 2000). Human beings will learn "from *any* medium, in school or out, whether they intend to or not, whether it is intended or not that they should learn...providing that the content of the medium leads them to pay attention to it" (Schramm, 1977, p. 267). As such, education should not be thought of as a "time-bound, place-bound process" (Coombs, 1973, p. 288), rather it begins long before a child steps into a classroom, and it continues well after graduating from a formal educational experience. The setting and nature of this education will vary. Some learning experiences will be formal and incremental with specific goals and objectives, but most learning will take place as each life is lived through day-to-day activities and experiences.

One of the hallmarks of education is the demonstration of what has been learned. In formal educational settings, assessment of learning comes in many forms, including tests, written papers, and the completion of projects. The task of assessing learning in informal environments is challenging. In settings such as museums, for example, curators and exhibit designers may have a specific set of learning goals they hope their exhibits will enable. These goals may be entirely different than those of the visitors. Exit testing may be effective in evaluating the immediate learning outcomes in terms of what the designers hoped the visitors would come away with, but does not take into account what the visitors knew beforehand, what they hoped to gain,

nor the long-term effects of the experience as they continue to build and make connections after they leave the museum.

Learning in everyday activities also poses a difficulty in assessment. Learning as we live our lives through everyday activities is so much a part of the human condition that to try and quantify this would be next to impossible. One of the fundamental questions is how to study, analyze, and assess the myriad factors that influence learning in such everyday environments, both during the experience, as well as after the experience as learners continue to build and elaborate on their learning days, weeks, even years later.

With every learning opportunity, be it formal or informal, learners enter the setting with a unique set of characteristics (Leinhardt, Tittle, & Knutson, 2002), bringing with them their own interests, motivations, experiences, and prior knowledge (Falk, 2004). These factors, as well as their social interactions with others and the physical environment itself, influence what individuals take away from the experience. The critical difference between formal and informal education is not so much the environment or setting, but who is in control of the experience and who guides the *intended* learning outcomes, realizing that unintended or incidental outcomes may also happen, and that these outcomes will likely fall outside the goals of the designers and facilitators (i.e. teachers, exhibit designers, interpreters, naturalists) of these environments, be they formal or informal.

In order to explore how learning occurs in informal settings and the many factors that influence the experience as well as the outcomes, we need to have an understanding of the different components that make up informal learning. In the following section, I introduce several definitions of learning, and the contexts of learning that are considered relevant to this study.

Background and Context

Any discussion of informal learning should begin with a look at definitions of the word *learning*, in both formal and informal contexts. In order to demonstrate the debate on learning theories, Dewey (1916/1997) relates two historically opposing interpretations of the meaning of *learning*. The first interpretation views learning as "the sum total of what is known, as that is handed down by books and learned men. It is something external.... Truth exists ready-made somewhere" (Dewey, 1916/1997, p. 334-335). This definition embodies the behaviorist approach to learning, which views knowledge as objective and empirically testable. Behaviorists believe that learning happens incrementally and passively as knowledge is passed from teacher to student. Hein (2004) borrows a passage from Dickens' *Hard Times* (Dickens, 1854/1999) to illustrate this idea.

The speaker, and the schoolmaster, and the third grown person present, all backed a little, and swept with their eyes the inclined plane of little vessels then and there arranged in order, ready to have imperial gallons of facts poured into them until they were full to the brim. (p. 2)

Though *Hard Times* was published over 150 years ago, this scenario is not unlike what is seen in many schools and universities today (Cuban, 1993).

On the opposite extreme, Dewey presents the view that learning is "something which the individual *does*.... It is an active, personally conducted affair" (Dewey, 1916/1997, p. 335). This definition embodies the constructivist philosophy. Constructivists see knowledge as a human construct rather than a true reflection of an objective, external reality (Gredler, 1992). This theory, based on the work of Jean Piaget, favors a hands-on, participative, active approach to learning.

The definition of learning that embraces an active, experiential approach can be expanded to one that equally values personal, social, and cultural aspects, where learning includes:

...shifts in attitudes, values, and beliefs; aesthetic understandings; psychomotor skills, such as discovering how it feels to turn a pot or play an instrument; social/cultural dimensions such as learning about someone in your family; and process skills such as thinking critically and refining one's learning skills, or perhaps even learning more about how to use a museum for lifelong learning. (Falk, Scott, Dierking, Rennie, & Cohen Jones, 2004, p. 172)

It is this interpretation of learning that exemplifies what takes place when people engage in their world and extends far beyond content knowledge, recognizing that engagement and involvement is a necessary and fundamental part of learning. This is true whether people are merely participating in everyday activities such as going to the store or taking their children to the playground; pursuing their personal interests by visiting historical sites or taking a drawing class; or engaging in social activities such as visiting family or going out with friends for lunch. *Learning Environments*

As indicated in the last section, learning is a complex activity that takes place in many types of environments. Three learning environments—formal, nonformal, and informal—will be described in this section to frame the context for this study, as well as some of the types of learning that occur within these settings.

Philip Coombs, through his work with the International Council for Educational Development (Coombs, 1973), defines *formal education* as the "the hierarchically structured, chronologically graded 'educational system', running from primary school through the university and including, in addition to general academic studies, a variety of specialized programmes and

institutions for full-time technical and professional training" (p. 289). Coombs also makes a distinction between two types of learning that happen outside the formal arena: nonformal and informal. *Nonformal education* is "any organized educational activity outside the established formal system—whether operating separately or as an important feature of some broader activity—that is intended to serve identifiable learning clienteles and learning objectives" (p. 289). After-school programs, senior programs, Boy and Girl Scouts, and continuing education classes are examples of such activities. Coombs defines *Informal education* as the:

Lifelong process whereby every individual acquires attitudes, values, skills and knowledge from daily experience and the educative influences and resources in his or her environment—from family and neighbors, from work and play, from the marketplace, the library and the mass media. (p. 289)

Further, it is this type of learning that accounts for the majority of any individual's learning over their lifetime (Coombs, 1985). Unlike nonformal education, informal education is rarely organized or systematic, rather it is learner-driven. If it is organized, it is not externally imposed; rather the learner or learners themselves are the organizers.

Some researchers agree with Coombs' definition of formal education (Carron & Carr-Hill, 1991; Hein, 2004). Where the literature tends to differ is in the terminology used to classify education and learning that is not formal. Hein (2004) prefers to use the term *informal* merely to indicate the absence of a formal curriculum in a particular setting. Falk and Dierking believe that it is too simplistic to define learning in terms of the setting, rather they prefer the term *freechoice learning* to indicate learning that happens because of a conscious decision to learn. The Cognition and Technology Group at Vanderbilt (1992) use the term *natural learning* to identify authentic, contextualized learning, such as that which happens between a parent and child, where

the participants care about the outcome and consider the knowledge gained to be tools that can be used to accomplish a task. Paris (2002) distinguishes between informal and formal learning environments as learning that is based on objects (informal) rather than text (formal). Other researchers just use the blanket term *informal learning* to refer to any learning that happens outside the classroom, whether in a museum, through conversations with friends, or watching television (Melber & Abraham, 1999).

Incidental learning can be a consequence of any of these types of learning experiences. Marsick and Watkins (1990) define incidental learning as "a byproduct of some other activity, such as task accomplishment, interpersonal interaction, sensing the organizational culture, trialand-error experimentation, or even formal learning" (p. 12). This learning is spontaneous, and may be completely unconscious on the part of the learner (Marsick & Watkins, 2001). For example, we might imagine a group of travelers who are visiting a foreign country for the purpose of touring ancient cathedrals, however they may also learn about the social customs of that culture, how to order in a restaurant, and how to navigate through the city. While some in the group may have anticipated these as potential outcomes, for others these learning experiences may not have been expected, or indeed even acknowledged.

For the purpose of this study, I broadly define informal learning as the daily acquisition of skills, knowledge, understanding, perspective, and awareness as an individual lives his or her life and makes meaning of those everyday experiences, interactions, adventures, and even the mundane. This definition combines the many possibilities of informal learning opportunities, and includes learning defined above as non-formal, informal, free-choice and incidental, realizing that all of these types of learning are possible and even probable in the context of this study.

Context and Learning

Context plays an important role in any learning situation. Falk and Dierking's (Falk & Dierking, 2000) Contextual Model of Learning (CML) was conceived as a framework through which to look at the complexities of learning through interactions between personal, sociocultural, and physical contexts over time. Indeed, until recently aspects of each of these contexts have been considered in turn, but rarely was their interplay the subject of researchers' interests.



Figure 1.1. Contextual Model of Learning (CML) Modified from Falk & Dierking (2000)

The personal context considers what the learner brings to the situation, and includes prior interest and knowledge, motivation, goals, expectations, experience, choice and control (Falk & Storksdieck, 2005). Research indicates that interest is a critical factor in learning, and that

individuals with high interest but low prior knowledge have more long-term learning gains than any other group (Falk & Adelman, 2003; Storksdieck, 2006). The importance of interest-based activities has also been demonstrated in school children on field trips; those who were allowed and encouraged to follow their interests while on the field trip were more likely to be motivated to a higher level of performance (Ellenbogen, 2002) and to be able to talk extensively about what they learned afterwards (Griffin, 1999b). The bulk of literature relevant to this research tends to focus specifically on museums, with the learners being primarily family groups, and school children on field trips.

The sociocultural context considers knowledge to be socially and culturally constructed. Unlike most evaluations that focus on individuals instead of groups (Allen, 2002), researchers interested in social interactions focus on natural groups, such as peers groups or (most commonly) family groups. Researchers have found that children who interact with an adult perform significantly better than those who do not; that parents deepen the level of interaction and engagement; and that children experiment more when interacting with parents (Blud, 1990; Crowley & Callanan, 1998). It is important to note that some researchers indicate that although parents help children complete activities, they do not necessarily help them to understand them (Schauble et al., 2002). Research in this area is emerging, but tends to focus on family groups in museums, with the emphasis being on children, and how adults interact with children to help them build understanding.

Research in the sociocultural arena also indicates that outside mediators and facilitators can influence learning experiences and outcomes, and that educational and interpretive programs have more effect on visitors than do signs (Dierking, Burtnyk, Buchner, & Falk, 2004). For example, visitors tend to behave more environmentally responsible after participating in

environmental programs, and those visitors have more environmental intentions than do those who have no environmental education (Dierking et al., 2004; Orams, 1997; Orams & Hill, 1998). However, I could find no research that indicates how these intentions held up over time, and whether they were followed through by behavioral changes.

Research in the physical context considers the surrounding environment. This could include the design of the environment and the intended message, how well the visitors' feel oriented and prepared for the experience, and even physical comfort factors such as temperature and safety. Research indicates that people who feel comfortable and secure in their surroundings, know what to expect, and know what is expected of them, are more likely to be able to focus and construct meaning from their experiences (Dierking, 2002). Children who were oriented to a science center before a visit, for example, outperformed on a post-test those who were not oriented (D. Anderson & Lucas, 1997). Children visiting a nature center who were more familiar with wooded areas were able to spend more time-on-task, were less disorderly, and had less negative comments about venturing off the path than urban children who were unfamiliar with wooded areas (Falk, Martin, & Balling, 1978).

Researchers are now beginning to look across contexts and to understand that learning continues to happen over a period of time after the initial experience (Dierking, 2002; Falk & Storksdieck, 2005; Storksdieck, 2006). While this line of research is being seen more and more often in museums, there is the need to extend a similar line of research into informal education in natural environments, which are arguably more complex due to the fact that they are less predictable and controllable than constructed settings such as museums, but equally at the mercy of individual differences. By taking a more holistic view of the learner and the many factors that influence the learning that happens in these natural environments, we can have a better

understanding of the experience itself, the experience of the learner within that setting, and how the learner continues to elaborate on that experience as time goes by.

Related Research

The bodies of literature that I consider most relevant to my research interests fall into three main categories: museum research (museums broadly defined to include science, nature, and technology centers; zoos; aquaria; botanical gardens; historical homes; and traditional museums of art, history); environmental learning in natural settings; and free-choice learning. At one time these areas might have been considered mutually exclusive, but in recent years the lines between each are beginning to blur, specifically as free-choice learning scholars reach across boundaries to consider free-choice learning in many different types of settings, including museums and natural environments.

Museum research has long focused on learning outcomes directly linked to the content of the exhibit and the goals of the designers (Storksdieck, Ellenbogen, & Heimlich, 2005). Traditionally, the standard method used to investigate this learning has been to do so within the walls of the museum, fixing it both physically and temporally (Storksdieck, 2006). These outcomes, however, do not give consideration for the motivations, interests, and needs of the learners themselves (Storksdieck et al., 2005), nor do they consider the many other factors that can influence an experience in both the short and long-term. In truth, it is difficult to separate the personal, social, and physical aspects that interplay when one embarks on some learning experience. In recent years there has been a shift in focus toward a more holistic view of learning in informal environments, one that realizes that these environments do not:

...aim exclusively or even primarily for improvement on measures of subject matter knowledge but instead tend to emphasize wider goals better captured by terms like

enculturation, development, attitude, and socialization. In a museum, each visitor's "treatment" is unique, because museums afford choice and variability in learning rather

than mastery of a common curriculum. (Schauble, Leinhardt, & Martin, 1997, p. 3) Research is being conducted that is crossing boundaries and looking at the big (or at least bigger) picture, considering a number of factors such as social influences as well as personal characteristics when considering learning outcomes. Increasingly researchers are widening the lens to look not at an instance of learning, but many snapshots of learning as they consider who the learners were before, what they did when there, and how they continued to elaborate on their experiences days, weeks, months, even years later (Falk, 2002; Rennie & Johnston, 2004). The need for a broader lens, particularly in informal contexts, seems even more pressing.

Statement of the Problem

As we explore instances of learning outside of formal education and recognize that learning continues over a lifetime, we are also realizing that learning throughout a lifetime enables each of us to contribute to society not only in the workplace, but also at home and in the community. Indeed, it is this arena of learning—beyond formal education—that makes up the vast majority of learning in which adults engage (Falk & Dierking, 2002). It is also perhaps the least understood. While there is a growing body of research that looks at informal learning in various settings, there exists a need to focus on the learning process holistically, to consider the complexity of the learners, their social interactions, and the environment over a period of time (Falk, 2004).

In the realm of museum research, for example, researchers have observed visitors' conversations (Leinhardt, Crowley, & Knutson, 2002) and social interactions with other members of their group (Schauble, Beane, Coates, Martin, & Sterling, 1996), while others have

discussed the behavioral characteristics of museum goers (Bicknell & Mann, 1993; Hood, 1993; Serrell, 1995) and have interviewed these visitors both as individuals (Feher, 1990) and as groups (Getty Center for Education and the Arts, 1991). Still, the study of learners and the available literature on the subject tends to focus on just a few variables, which fails to recognize the complexity of the learning process in such environments (Falk, 2004).

As interest in informal learning continues to expand, more research is needed to understand how learning occurs and how best to support learning activities in these environments. Instead of merely considering individual dimensions, the analysis should be multidimensional, where learning is observed over a period of time and considered using a broad definition. Instead of getting a snapshot of who the learner was at the time of the experience, the individual must be viewed with a wider lens in order to capture an understanding of who the learner was before the experience (such as background, prior experience, interest, motivation, knowledge), to know with whom the learner interacts (such as the interactions with companions, strangers, educators, and staff), the role played by the physical environment, and the way(s) in which the learner continues to make connections and build on the experience over time.

Purpose Statement and Research Questions

The purpose of this study was to explore the role of *personal, sociocultural, and physical contexts* on the short- and long-term experiences of adult participants in a natural, informal learning environment. The research questions for this study were:

- How do the personal, sociocultural, and physical contexts influence participants' shortterm and long-term perceptions of the nature of their experience?
- How do the personal, sociocultural, and physical contexts influence participants' perceptions of their short-term and long-term learning?

For the purpose of this study, the personal context included an individual's background, interest/motivation, and prior knowledge; the sociocultural context included exchanges with and influences of educators, companions, and strangers; and the physical context included the designed experience, as well as uncontrollable and dynamic factors of the environment.

Relevance of the Study

Because this study sought to explore perceptions and learning of participants in a natural environment in both the short-term and long-term, it reaches an area of inquiry in informal learning that has not extensively been explored, but is arguably one of the major concerns of informal learning – what happens during and immediately after an experience, and what continues to happen (or fails to continue to happen) in the weeks and months that follow the experience. It is agreed upon by some researchers (D. Anderson & Shimizu, 2006b; Falk & Dierking, 1994; McManus, 1993; Stevenson, 1991; Storksdieck, 2006) that learning is not an instant in time, but a process that happens over a period of time. This study contributes to the small but growing field of inquiry that looks at what happens after learners leave the point of impact (for other studies, see D. Anderson, 2003; Falk & Dierking, 1994; McManus, 1993; Storksdieck, 2006). More specifically, this study explores an area of informal learning that has not been investigated in this manner by looking at the many factors that effect a natural learning experience that has also been infused with a learning curriculum that to some extent visitors were free to participate in, or not participate in, as they engaged in the environment.

The possible beneficiaries of this research include both researchers and designers of informal learning environments, specifically those interested in environmental education in natural settings. They stand to benefit through a greater and expanded understanding of those factors that visitors themselves see as important and meaningful, either because they have

specifically indicated that they had an effect, or because there was longer-term evidence of the effect through recall and remembrances. These insights could prove useful to environmental educators and other designers of free-choice educational settings to understand what types of experiences are seen as salient, important, or memorable to learners.

Definitions of Terms

<u>Learning</u>. A cumulative process that builds from multiple sources, previous knowledge, interactions, and experiences that results in a relatively persistent change in skills, knowledge, understanding, perspective, or awareness over time (Dierking, 1991; Driscoll, 2005; Falk, 2005). <u>Constructivism</u>. A philosophy and epistemology that holds that knowledge is not received, but is actively constructed (Hein, 2004); "individuals construct knowledge as they attempt to make sense of their experiences. They come to an 'acceptable' understanding of truth within a particular context" (Hannafin & Hill, 2002, p. 77).

<u>Formal education</u>. "The hierarchically structured, chronologically graded 'educational system', running from primary school through the university and including, in addition to general academic studies, a variety of specialized programmes and institutions for full-time technical and professional training" (Coombs, 1973, p. 289).

<u>Non-formal learning</u>. Those activities and programs that are organized and have learning objectives, but fall outside the formal learning system (Coombs, 1973).

<u>Informal learning</u>. The lifelong learning of values, skills, and knowledge; it is often "unorganized, unsystematic and even unintentional at times, yet accounts for the great bulk of any person's total lifetime learning" (Coombs, 1973, p. 8)

<u>Free-choice learning</u>. Learning that is "self-directed, voluntary, and guided by an individual's needs and interests," (<u>http://www.ilinet.org/freechoicelearning.html</u>) and happens because an

individual, or group of individuals, has made the decision to engage in some activity with the express purpose of learning.

<u>Incidental learning</u>. Occurs as the result of an experience, though not necessarily part of the design (Storksdieck et al., 2005); it is often characterized as an unconscious by-product of some other activity or experience (Marsick & Watkins, 1990, 2001).

<u>Informal learning environments</u>. Those environments, designed or natural, that afford explorative and experiential opportunities and lack a formal education curriculum (Hein, 2004).

<u>Natural learning environments</u>. Uncontrived, contextual settings where the learner is engaged in an environment that has not been manipulated or controlled. It may or may not have a designed educational component, and attempts to minimize human impact on the setting (Cognition and Technology Group at Vanderbilt, 1992)

<u>Museums</u>. Generic term used to identify cultural institutions such as science, nature, and technology centers; zoos; aquaria; botanical gardens and arboretums; historical homes; living history farms and forts; and traditional museums of art and history.

<u>Short-term</u>. Occurring immediately after or within a few weeks of the conclusion of the experience.

<u>Long-term</u>. Occurring some time after the experience, ranging anywhere from a month to many years. The critical component is not a definitive amount of time but the allowance of some time to pass to allow for further processing, reflection, and meaning-making, realizing that the potential for learning never ends and that this is just a snapshot in the learner's life.

CHAPTER TWO: LITERATURE REVIEW

Introduction

In this chapter, I will review the literature in three main domains—museum learning, environmental learning in natural environments, and free-choice learning—to seek answers to the following questions:

- How do different environments of informal learning intersect and parallel, and in what ways are they unique? How can what we know about learning in one environment inform the other?
- What learning theories are most relevant to informal learning?
- What does the literature say about the role of context, how it has been studied, and what has been found in terms of learning in informal environments?
- How have informal learning researchers typically measured or assessed learning and what have they found about the effectiveness of those measures?

One of the primary resources I turned to was GALILEO, an online repository for over 100 databases through the University System of Georgia. Using GALILEO I searched primarily for peer-reviewed articles from reputable academic journals using a number of databases, including Academic Search Premier, Education Full Text, ERIC, PsycARTICLES, Psychology and Behavioral Science Collection, and PsycINFO. As I have collected articles over the past three years, I have conducted innumerable searches with search terms that include: informal learning, nonformal learning, free-choice learning, incidental learning, environmental education, and ecotourism. I often turned to the reference section of these articles to find other articles of relevance. Often this would lead me back to GALILEO or to GIL, the University of Georgia's online library catalog.

When unable to find articles in GALILEO or in the University library, I often went to the authors' websites to see if the articles were available there. The authors of the articles themselves have often been helpful to me, sending me recommended reading, bibliographies, and even copies of their articles when I have not been able to locate them elsewhere. I have also used the University's Interlibrary Loan to obtain many articles contained in journals that we do not have access to through the University system. Peers and colleagues have been helpful, especially those with whom I have met and conversed through professional conferences. Finally, I have consulted the World-Wide Web using the Google® search engine, including Google® Scholar and Google® Books, on a regular basis.

I will begin the review by revisiting my definition of "informal learning" and defining the learning environments. I will then describe several learning theories that seem most relevant for informal learning. Next, I will explore what the literature has to say about context in informal learning, and will look at how researchers have traditionally measured or assessed learning in informal environments. Finally, I will summarize what the literature tells us, and discuss what has not been addressed.

Defining the Environments

For the purpose of this study, I define informal learning as the daily acquisition of skills, knowledge, understanding, perspective, and awareness as an individual lives his or her life and makes meaning of those everyday experiences, interactions, adventures, and even the mundane.

Kola-Olusanya (2005) summarizes three kinds of learning experiences: *direct*, where the learner is interacting with authentic objects and environments, such as a neighborhood park,

playground, or forest; *indirect*, where the learner is involved in a contrived or regulated experience, such as contact with domesticated animals, or encountering animals or flora in a zoo or botanical that cannot exist without human intervention; and *symbolic*, which are "metaphorical or stylized characterizations" (Kola-Olusanya, 2005, p. 302) where the experience is depicted symbolically such as with television, printed materials, or the Internet. Together, the three learning environments I describe in the following pages could arguably contain elements of all three of these learning experiences.

Museums

The characterization of museums has changed drastically over the past 50 or so years. Arguably the most notable change happened in 1969 when physicist Frank Oppenheimer opened the Exploratorium in San Francisco. Once thought of as dry, dusty buildings (Falk et al., 2004) which held objects to look at but not touch, the Exploratorium changed the image of museums from hands-off to hands-on—and minds-on (Duckworth, Easley, Hawkins, & Henriques, 1990). Oppenheimer's legacy is evident in the hundreds of children's museums, discovery museums, science centers, and interactive rooms all over the country today.

Despite considerable variability in the types of museums, there are some characteristics of museums that tend to remain stable, including a rather short exposure time, and the ability to forge one's own path and move through at one's own pace. Most museum visits last no more than two hours (Falk, 2002), and visitors usually spend less than one minute at each exhibit component they visit, and visit less than half the components of any given exhibit (Hein, 2004). They are more likely to use trial-and-error techniques to figure out interactive exhibits than they are to read the labels, and "museum fatigue," a term commonly used to describe the way that

visitors spend progressively less time engaged with exhibits, tends to set in after about 30 minutes (Hein, 2004).

Stevenson (1991) however found no evidence of museum fatigue in his study of visitors to an interactive science center. In one of the earlier studies of interactive science and technology centers, Stevenson tracked twenty visitors though an interactive exhibit called Launch Pad in the London Science Museum. He found that visitors spent between 40 and 90 minutes in the exhibit, and that there was very little variation in visitor behavior over the length of their time in the exhibit, leading Stevenson to conclude that visitors to this interactive exhibit were more attentive and less inclined to museum fatigue than in traditional museum exhibits.

Another defining characteristic of museums is that visitors, for the most part, move through them at their own pace, forging their own path, attending to exhibits of interest and passing by those they choose not to spend time with:

We expect these institutions to provide a hugely diverse visiting public with entertainment, the freedom to choose their own path, follow their personal interests, do their own inquiry, and create their own meanings. Yet at the same time, we want our museums to be respected educational institutions where people can spend an hour and come away having learned some canonical science. (Allen, 2004, p. S18)

While the exhibit designers often have learning goals in mind, once the exhibits are on the floor it is the choice of the visitors whether or not they will attend to them.

Visitors to museums have been categorized in a number of ways. A classic and often cited taxonomy of visitors to an exhibit in the Smithsonian Museum of Natural History identified four different types of visitors in terms of their behavior in the museum (Wolf & Tymitz, 1978):

- 1. The Commuter, who simply uses the exhibit as a walkway to get to another point of the museum, walking quickly and appearing to pay no attention to the exhibit.
- The Nomad, who is casual, wandering and open to finding something of interest, occasionally stopping but not appearing to find any one particular thing interesting in the hall.
- 3. The Cafeteria Type, who wants to find something interesting and stops frequently, looking to "put something on his or her tray" (p. 11).
- 4. The Very Interested Person, who has some prior interest in the subject matter of the exhibit hall, and moves through the hall slower, more deliberately, and critically.

Other researchers have come up with their own categories (as cited in Hein, 2004), such as students, observers, loungers, and emigrants (Higgins, 1884); and ants, butterflies, grasshoppers, fish (Vernon & Levasseur, 1989). It follows that outcomes from the visit will be different for each of these types of learners, as will their agenda and goals for being there in the first place.

It appears evident from the literature that people visit museums for different reasons, and that visitors use exhibit spaces differently and to their own purpose despite of or in spite of the goals of the designers. Overall, it seems that museum visits tend to be rather short events in peoples' lives. Next, I will explore the area of environmental learning, why people engage in this form of learning, and how it may impact their lives.

Environmental Learning in Natural Environments

The commercial industry of ecotourism and wildlife tourism is a growing part of the global economy (Kimmel, 1999). The level of these programs vary wildly, from little to no interpretation, to highly structured educational agendas (Reynolds & Barithwaite, 2001). There has long been the belief that simply taking people out into nature will move them to adopt more

environmentally responsible behaviors, though this belief has been called into question (Ferreira, 1998; Orams, 1997; Russell, 1994). Still, there has been little research directed at investigating the impact of environmental education on tourists' behaviors.

If we revisit Kola-Olusanya's (2005) taxonomy of learning experiences, those that take place in natural environments would be considered *direct* learning experiences; that is, the learner interacts with authentic objects and environments. Whether we use the term ecotourism, environmental learning, or wildlife tourism, the context refers to uncontrived experiences in natural environments. Still, that does not mean that learners are simply placed in a natural setting and left to their own devices. Indeed, this type of behavior is arguably what is the most damaging aspect of ecotourism; the introduction of humans into what is usually an exotic and often vulnerable environment (Orams & Hill, 1998).

In an attempt to control the damage that humans inflict on such natural settings, a variety of measures have been adopted (Orams & Hill, 1998). Most of these fall into one of three areas: physical responses, which seek to control tourists' behaviors by physically restricting their movements in the natural environment; regulatory responses, which establish rules and regulations for compliance and threaten to punish those who do not comply; and education strategies, which attempt to inform tourists so as to encourage voluntary compliance as appropriate to the environment. Unfortunately, most management responses fall into the physical and regulatory realm (Orams & Hill, 1998).

Research and resources into environmental education have been scarce (Orams & Hill, 1998), but are growing. Unfortunately, the findings across these studies are not consistent. For example, Orams and Hill (Orams, 1997; Orams & Hill, 1998) found that an education program in Australia had considerable impact on the likelihood that visitors would change their behaviors

and become more "green." However, others have found that when behavioral changes do happen, they tend to be short-lived, possibly due to a lack of subsequent experiences that reinforce the behavior after the visit (Ballantyne & Packer, 2005).

Free-choice Learning and Free-choice Learning Environments

Free-choice learning is "self-directed, voluntary, and guided by an individual's needs and interests" (http://www.ilinet.org/freechoicelearning.html). It is learning by choice because an individual, either alone or in a group, has made the conscious decision to engage in some activity with the purpose of learning. Each individual will have different learning goals, and each individual brings different motivations, interests, and prior knowledge to the situation, even if the group as a whole also shares a learning goal (Falk, 2005). Free-choice learning "tends to be non-linear, is personally motivated, and involves considerable choice on the part of the learner as to what to learn, as well as where and when to participate in learning" (Falk & Dierking, 2000, p. xii).

Although for this review free-choice learning is categorized as a different area of research then the prior two categories, that is not to say that they are each mutually exclusive. In fact, both museum learning and environmental education can be thought of as free-choice learning when the conditions are such that the individuals involved are participating because of a choice and desire to learn, and the literature does include research in both of these areas. This is not to say that all learning in the preceding environments is free-choice. Find any student on a field trip moving through an exhibit hall on a strict time schedule with worksheet in hand, being ushered past exhibits of interest because it is not on the agenda, and he or she would likely argue against it being a "free-choice" experience.

There is a growing body of research that focuses specifically on free-choice learning environments. Most notable is the work done by the Institute for Learning Innovation (http://www.ilinet.org/). Their research is not limited to museums, but also includes such institutions as public television stations, libraries, and community-based organizations such as scouts and the YWCA, to name a few. Free-choice learning research focuses more on what the learner gets out of the experience and how they make meaning, rather than the goals intended for the learner by the designer (Ballantyne & Packer, 2005). This is true to the nature of free-choice learning, which maintains that personal characteristics such as prior knowledge, interest, and motivation influence the outcome of any free-choice learning experience (Falk & Adelman, 2003; Falk et al., 2004; Fienberg & Leinhardt, 2002).

Relating These Three Areas to This Research

The setting of interest for this study is a whale watching boat, and looks at the experience of passengers on a 3-4 hour whale watching tour. The parallels between this research setting and the previously described areas of research are many, though no one environment previously described covers the complexity of the research setting in and of itself. As a result, I found it important to consider each of these three areas when turning to the literature to design my own study. As with a visit to a museum, immersion in this environment is fairly limited in terms of time. The average visitor to a museum spends less than two hours; the average trip on the boat is about 3-4 hours. This is in contrast to say a 5-day hike through the outback or a 2-week tour through the Alaskan wild. Some research indicates that there is an optimal length of time (several days) necessary to bring about changes in attitude (Ferreira, 1998), so both museums and the setting of interest in this study challenge that assertion.
A notable difference between museums and the whale watching boat is in the amount of engagement opportunities. A museum is typically full of exhibits, has a larger floor space, and is open to where visitors can come and go when they please. Visitors decide when they are finished, and they can walk out the door after ten minutes, or ten hours (assuming the museum's hours are accommodating). The whale watching boat is unique in the sense that all the passengers must be on board when the boat leaves, and no one can get off until the boat pulls back into the harbor. Further, the boat itself is limited in size and engagement opportunities; there are educators walking around with artifacts and games, there is a galley area where passengers can get snacks, and of course, there are (hopefully) the whales themselves.

Another difference is in the comfort of the visitors. In a museum, visitors can expect that the room will be set to a comfortable temperature, they will be protected from the elements, and the ground beneath their feet will be solid. On the boat, passengers are at the mercy of the temperature, wind, weather conditions, and roughness of the seas. There has been some research to show that comfort is a factor in learning, and these factors lie at the foundation of Maslow's hierarchy of needs (Maslow, 1999).

The whale watching boat also has relevancy to the environmental learning literature. Both of these settings highlight direct learning experiences with an environmental emphasis, contextually situated in natural settings. Excursions into natural environments through wildlife tourism can be as brief as an afternoon (as with a whale watching trip), or as extended as spending an entire season in the rainforest. The other commonality is the environmental message that is always promoted on the whale watching boat, and usually promoted in wildlife tourism (though to varying degrees). In my experience with this particular whale watching company I have never seen them promote their tours specifically as ecotourism, but they do have a number

of similarities with what The International Ecotourism Society (TIES) calls the principals of ecotourism (<u>http://www.ecotourism.org/</u>), specifically:

- Minimize impact
- Build environmental and cultural awareness and respect
- Provide positive experiences for both visitors and hosts
- Provide direct financial benefits for conservation

TIES defines ecotourism as "responsible travel to natural areas that conserves the environment and improves the well-being of local people" (<u>http://www.ecotourism.org/</u>). These principals and this definition are consistent with what the whale watching company advocates with their tours and their onboard education program which promotes the idea that "education is the key to conservation, and that the fate of whales and their environment lies largely in the hands of our passengers."

The free-choice learning literature cuts across all of these settings. Of relevance is the fact that a whale watching excursion is most likely a free-choice learning experience for the passengers. While it could be argued that not everyone who participates in a family or group activity is doing it purely by choice, the fact that the environment itself is a free-choice learning environment, and that most people are likely to be there on their own free will makes it relevant to the study. Of interest is whether the passengers on the boat are there for the purpose of learning, entertainment, social engagement, or some other reason.

Learning Theory and Informal Learning

It would be misleading to imply that there are certain learning theories that are particular only to informal learning. Depending on the nature of the learning opportunity and the perceptions of the learner, learning situations can happen anywhere (Dierking, 1991); the

processes are not the sole domains of either formal or informal learning environments. Therefore, the learning theories that support informal learning are not unique to these settings. With that in mind, there are some theories that support the research of learning in informal settings that are dominant in the recent informal learning literature, namely constructivist and sociocultural theories of learning. It is worthy to note that researchers in this domain have lamented that until recently, theory has not played a significant role in the research of informal learning (D. Anderson, Lucas, & Ginns, 2003; Hooper-Greenhill, 1999; Schauble et al., 1997).

Hein asserts that the nature of any museum exhibit is influenced by the designer's epistemology, and that different types of museums can represent different epistemologies (Hein, 1999, 2004). For example, traditional museums were more orderly and systematic in nature; they often had a specific path to be followed and information was presented in a style reminiscent of traditional educational practice; that is, labels and panels presenting information, and sequential exhibits with a beginning and end (Hein, 2004). Arguably the movement today is towards museums that fall within the realm of discovery learning (in Discovery Museums) and constructivist learning (in Constructivist Museums).

Discovery Museums make the shift from "teaching" to "learning" (Hein, 1999, 2004). Discovery learning embraces the idea that:

Learning is an active process, that learners undergo changes as they learn, that they interact with the material to be learned more fundamentally than only absorbing it, that they somehow change the way their minds work as they learn. Learning includes more than piling facts and concepts into the warehouse of the mind. As people learn, their capacity to learn expands; the shape and volume of the mind's warehouse is transformed by the process of grappling with the new information. (Hein, 2004, p. 30)

Even more traditional museums are increasingly including discovery rooms where visitors can explore, examine, and "experience" materials. Some of these rooms are truly "discovery" in nature, but many of them follow a more constructivist epistemology where the emphasis is on the questioning and exploration, rather than an inevitable conclusion (Hein, 2004).

Constructivist museums allow visitors to forge their own path and have no right or wrong way to use, move through, or interact with the exhibits. These museums give the visitor opportunities to link their new knowledge with prior knowledge and to make connections to what they already know. The focus in on the learner, not the subject matter (Hein, 2004).

Constructivists believe that "knowledge is constructed by learners as they attempt to make sense of their experiences" (Driscoll, 2005, p. 360). When faced with new experiences, learners actively try to relate them to their existing mental structures until they either find one that fits, or reconstruct the existing mental structures to accommodate the new information (von Glasersfeld, 1990). Informed by the works of Dewey, Piaget, Vygotsky, Bruner, and Gardner, constructivist theory holds that the learning process is "interwoven with a variety of…individual and contextual elements" (Neuman, 2004, p. 517). These contextual elements play an important role in constructivist theory; instead of breaking learning down into its component parts, constructivists tend to favor learning in which knowledge and skills are inseparable from the context (Hannafin & Hill, 2002).

Constructivist theory informs research and practice in informal learning environments by allowing the learner to forge an individual path, and by both the learner and the facilitator recognizing that there is no right or wrong way to use the environment (Hein, 1999). In a constructivist museum, for example, visitors choose how to move through and interact with the

exhibits. This type of environment gives the learner the opportunity to link new knowledge with prior knowledge, focusing on the learner rather than the subject matter (Hein, 1999).

Clarke (n.d.) expands on Hein's (2004) framework to include a sociocultural model, which posits that knowledge exists within the culture, and the child makes sense of it through interactions within that culture, with an emphasis on child/adult interactions. The sociocultural museum model shares characteristics of the constructivist museum and indeed the museum itself might look the same; the difference is in the theory behind the model. Sociocultural theory holds social interactions as critical components of the construction of knowledge, putting the focus on the social and cultural context rather than the individual.

Over roughly the past ten years, scholars of informal learning have largely embraced constructivist (D. Anderson et al., 2003; Clarke, n.d.; Falk et al., 2004; Hein, 1999, 2004) and sociocultural (Allen, 2002; Dierking, 2002; Falk, 2004; Falk & Dierking, 2000; Falk & Storksdieck, 2005; Schauble et al., 1997; vom Lehn, Heath, & Hindmarsh, 2002) theories of learning. In fact, these theories act as themes in the following section that looks at how context has guided informal learning research.

Context and Informal Learning

The Merriam-Webster online dictionary defines context as "the interrelated conditions in which something exists or occurs" (http://www.m-w.com/). Context becomes the focus of what Falk and Dierking (2000) call the Contextual Model of Learning (CML) (Dierking, 2002; Falk & Dierking, 2000). More of a framework than a model (Falk & Storksdieck, 2005), the CML was conceived as a way to look at the complexities of learning through interactions between personal, sociocultural, and physical contexts over time. In this section, I will describe the CML, and present research that has examined factors from each of these contexts in isolation. Then I will

turn to the small body of research that attempts to look across two or more of these contexts in order to get a more holistic view of the learning process and its complexities. Finally, I will examine studies that have extended the time frame from a moment in time to a longer-term look at learning in informal environments.

In truth, it is difficult to separate the personal, sociocultural, and physical contexts that interplay when one visits a museum or embarks on some informal learning experience. These categories therefore are somewhat artificial. In putting these studies in certain categories, I attempt to present the focus of the researchers in terms of their research questions and do not mean to suggest that the other contexts do not also come into play.

The Personal Context

Based on constructivist views of learning, the personal context considers what the leaner brings to the experience as a major factor of what they get out of the experience. Of course, this is different for each individual involved, and therefore implies that every individual will have unique experiences and learning outcomes. The personal context includes: motivation and expectations; interest; prior knowledge and experience; and choice and control (Falk & Storksdieck, 2005).

There is a wide range of variability in visitors' prior knowledge, experience, interest, motivations, and expectations when visiting a free-choice learning environment. These factors can influence the nature of the experience as well as the learning outcomes. In a study by Falk and Adelman (2003), visitors to the Baltimore Aquarium were grouped into one of three categories—extensive, moderate, and minimal—based on their conservation-related knowledge and interest. The researchers wanted to see if such grouping "yielded an enhanced view of the impact of an [aquarium] visit compared with overall measures" (Falk & Adelman, 2003, p. 171).

This study involved interviewing adult visitors (N=100) on their way in to the Baltimore Aquarium, and again on their way out. Entry interviews focused on conservation knowledge, interest, and behaviors. Exit interviews focused on visitors' perceptions of the aquarium's overall message, what conservation the visitors associated with the aquarium, and motivation to get involved in future conservation behaviors. The results indicated that interest, not prior knowledge, was the critical factor in conservation learning.

Falk et al. (2004) looked at prior knowledge, interest, agenda, and perceptions of 199 visitors, aged 16 and older, to two different interactive museums. They interviewed participants before their visit about prior interests and knowledge, their history of visitation to the institution, and asked visitors to use Personal Meaning Maps (PMM) to demonstrate their answer to the question, "What comes to mind when you see the word *museum/science center*?" Immediately after their visit, and then again 4-8 months later by phone, visitors were asked to describe their experience, answer specific questions regarding their interactions, and to consider their PMM again and make any changes. The researchers found that visitors' pre-existing conditions strongly influenced the nature and extent of their learning. These findings were echoed by Storksdieck, Falk, & Witgert in a paper presented by Storksdieck at the Annual Meeting of the National Association for Research in Science Teaching (Storksdieck, 2006), who found that the most long-term learning was exhibited from visitors who had high interest but low prior knowledge when they first went to the museum.

Fienberg and Leinhardt (2002) focused on background characteristics and interests (or *visitor identity*) and the nature of visitors' conversations (or *explanatory engagement*). The purpose of their study was to "understand the connections between visitors' identities and the structure and content of their conversations in a museum" (p. 167). They used pre- and post-tour

interviews, and audio-taping of ten groups of visitors, including both adults and children, as they moved through an exhibit on glass in a history center. Conversations were analyzed for both structure (pattern of talk) and content. Participants were rated as high, medium, or low in terms of their connection to glass, relationship to Pittsburgh (the location of the museum), and frequency of museum visits. The researchers found that over half of the conversations consisted of expanding on information offered by the museum, and that there was a distinct relationship between identity and conversations. For example, those with more knowledge and interest tended to give expanded explanations. The nature of the makeup of the groups also impacted explanatory talk; parent-child groups had more explanatory talk, even those without high content knowledge. The researchers concluded that visitors' backgrounds and identities are an important element in what they take away from the experience.

Other researchers have explored how an interest-based curriculum affects the use of museums and the resulting learning outcomes. In a case study of a family who homeschools their two children (ages 12 and 14), Ellenbogen (2002) went to museums with the family, observed at home, in the car, at festivals and leisure activities. For this family, their educational activities were interest-based, and they used many environments as places for learning. Though the mother (who was also the teacher) of the family had specific ideas about what was educational and what were merely hobbies, most of the curriculum was interest-based, which they incorporated into their state-mandated educational time. The importance and benefits of interest-led educational activities has been demonstrated in both museums and in schools (Csikszentmihályi & Hermanson, 1995, 1999; Griffin, 1998); it is believed that intrinsically motivated activities are more likely to push individuals to a higher level of performance (Ellenbogen, 2002).

The way that families act and interact in museums has also influenced school field trip practice. Griffin (1999a) modeled her interest-based field trip curriculum for students after families in museums, focusing on how they move around the environment based on their own interests. Her framework, called School-Museum Integrated Learning Experiences in Science (SMILES), provides conditions for self-directed learning by letting the students pursue their interests and their own line of inquiry first in the classroom, and then in the museum by letting them form groups with an adult leader to facilitate the learner-centered/learner-driven inquiry. Griffin found that students who are allowed to pursue their own lines of inquiry based on their interests were much more likely than their traditional counterparts (who typically have no preparation for the field trip, and follow an imposed line of inquiry) to be able to talk extensively about what they learned, even when they were not directly asked about learning. The students also linked "learning" and "fun."

Researchers exploring personal characteristics have focused on adults, adult-child groups, as well as school children. The research indicates that interest and prior knowledge play a role in the learning that happens during an experience, and that visitors of all ages appreciate the ability to move through a space according to their interests. The literature seems to be lacking in other areas relevant to personal characteristics, however. For example, I found little research relating specifically to the role of motivation in such environments. Csikszentmihályi and Hermanson (1999) discuss conditions for "flow" and visitor motivation in museums, but the article is theoretical and based on their own research in other areas, not specifically on research in museums.

The Sociocultural Context

The sociocultural context is grounded in a paradigm that views knowledge as socially and culturally constructed, thus reality is not a truth but a social invention. Sociocultural theory is based on the concept that "human activities take place in cultural contexts, are mediated by language and other symbol systems, and can best be understood when investigated in their historical development" (John-Steiner & Mahn, 1996, p. 191). Originating in Vygotsky's work, sociocultural theory emphasizes the role of culture and society in children's development and values process over product (Schauble et al., 1997). Through interactions within the culture, children learn. This learning takes shape in a number of ways, but it is mediated through cultural and psychological tools that help us to make sense of the world around us (Lemke, 2001; Robbins, 2002).

Social interactions in the informal learning literature can be broadly divided into two categories. By far the most studied category has to do with those social interactions within communities of learners, whether they are between school groups, peer groups, or most commonly, family groups. For example, Blud (1990) looked at learning through social interactions within adult-child dyads. She interviewed 24 dyads at each of three exhibits at a science museum in London. All exhibits had to do with the operation of gear wheels: one was static, one a push-button exhibit, and one was fully interactive. Half of the dyads at each exhibit were asked to discuss (social condition), then answer questions. The other half were asked to examine on their own (individual condition), then answer questions. She found that performance was not significantly better at the interactive exhibit than at the static exhibit across the groups, but that children in the social condition at the interactive exhibit did perform significantly better

than those children in the individual condition at the same exhibit. This difference was not evident with the other non-interactive exhibits.

Crowley and Callanan (1998) were also interested in parent-child interactions. They compared one group of children (N=41) who visited an interactive exhibit by themselves, and another group of children (N=49) who visited with a parent. They found that children who visited with a parent were twice as likely to use the exhibit as intended by the designers, and stayed at the exhibit longer and explored it in more detail, sometimes even repeating actions. Children in the group who visited without a parent often spent less than one minute at the exhibit. The researchers concluded that the parents deepened the children's level of engagement, and that those children had a broader experience than those who visited without their parents.

In a study by Schauble et al, (2002) however, they found that though parents did much to help their children *complete* experiments, they did little to help them *understand* them. Schauble and her colleagues worked with 20 parent-child dyads (children between 8-12 years of age) at a 6-foot model of The Creek, which is a larger exhibit found in the Children's Museum of Indianapolis. The dyads worked together for 45 minutes manipulating boats and the creek itself in order to find out what effects boat speed. The dyads were to take notes, documenting their experiments. The researchers found that the parents made most of the conclusions and did most of the "head work," while the children did most of the physical work (manipulating the boats and the creek). Further, the parents seemed to think that their conclusions were self-evident and required no further explanation or discussion with their children. The results indicated that the adults made considerable progress at developing a model to explain the system, but the children did not make any progress. The researchers concluded that the parents did not understand that

their children were not grasping the higher concepts, and did not provide assistance because they did not realize it was needed.

The other category of social interactions found in the informal literature is between visitors and outside mediators, be they interpreters, explainers, field guides, teachers, or other facilitators (Dierking, 2002). Unlike in museums where it is usually easy to move through with no outside mediation, environmental programs typically incorporate some level of facilitation by naturalists or interpreters, albeit to varying degrees. Likewise, the fruitfulness of these interactions varies.

Orams and Hill (Orams, 1997; Orams & Hill, 1998) explored the impact of an education program enacted at Tangalooma Resort, which lies on Moreton Island in Australia. The surrounding bay is home to approximately 400 bottlenose dolphins and 120 Indo-Pacific humpback dolphins. Before the enactment of the education program, the resort tried to keep visitors' from inappropriately feeding the dolphins by posting a set of rules and having two staff members present to try to ensure compliance. Fifty-three feeding sessions were observed under this condition. The following year, an education program was set up with two main features to educate the visitors. First, they established the Dolphin Education Centre; this facility was staffed by the principal researcher and volunteers and had a number of resources available to visitors, such as a library, posters, displays, and a small theater. Visitors who wanted to feed the dolphins had to visit the center in order to obtain tokens that they could exchange for fish for feeding the dolphins. The second feature of the program was a public address system where the principal researcher could talk with the dolphin feeders, answer questions, educate tourists about dolphin behavior and biology, and encourage the visitors to be more environmentally responsible. They found that non-compliant behaviors were significantly reduced as a result of

the program, and that visitors had more intentions to follow up with environmentally responsible behavior after the visit than their counterparts who had no interactions with the naturalists or volunteers (Orams, 1997; Orams & Hill, 1998).

Despite some indications that learners can benefit from facilitation by others more knowledgeable than themselves, one group that seems to repeatedly miss this opportunity is students on school field trips. There has been a considerable amount of research that suggests that although teachers speak of the importance of linking field trips to the curriculum, rarely does this actually seem to happen in practice (Ellenbogen & Stevens, 2005; Griffin, 1998; Griffin & Syminton, 1997). Students frequently face unnecessary challenges and missed opportunities when going on field trips. Many students arrive at a museum unprepared for the experience, having had no curricular preparation for the excursion, and regard it primarily as a day off (Cox-Petersen & Pfaffinger, 1998; Griffin & Syminton, 1997). Some students arrive with questions and expectations, having prepared extensively for the field trip (Cox-Petersen & Melber, 2001), but unfortunately for these students, the teachers and museum educators often have had no communication about the direction of the curriculum or the possible nature of the students' questions (Griffin, 1998). Therefore, the museum educators miss out on opportunities to customize the students' visit, and the students may feel frustrated and unsatisfied because the experience did not answer their questions.

Researchers interested in the sociocultural context tend to focus on interactions within natural groups, such as peers groups or family groups. Researchers have found that children who interact with an adult perform significantly better than those who do not, that parents deepen the level of interaction and engagement, that children experiment more when interacting with parents (Blud, 1990; Crowley & Callanan, 1998), but that although parents help children

complete activities, they do not necessarily help them to understand them (Schauble et al., 2002). Research in this area is emerging, but tends to focus on family groups in museums, with the emphasis being on children, and how adults interact with children to help build understanding. Less prevalent in the literature are studies that focus specifically on adults, rather than on how adults facilitate learning in children.

Research in the sociocultural arena also indicates that outside mediators and facilitators can have an impact on learning experiences and outcomes: educational and interpretive programs have more effect on visitors than do signs (Dierking et al., 2004); visitors tend to behave more environmentally responsible after a program; and visitors have more environmental intentions than do those who have no environmental education (Dierking et al., 2004; Orams, 1997; Orams & Hill, 1998). However, I could find no research that indicates how these intentions held up over time, and whether they were followed through by behavioral changes.

The Physical Context

The Physical Context includes orientation and advance organizers, design, and reinforcing events and experiences outside the museum. In order to learn, it is important to feel comfortable in your surroundings (Falk & Dierking, 2000). This can include physical comfort, such as temperature, or in the case of a whale watching boat, the feeling of safety and stability. Advance organizers are also important; when people know what to expect and have some context for their learning, they are more likely to be able to construct meaning from their experience. The design of the physical environment certainly affects visitor experience and learning, though not always in the way the designers intended. On a whale watching boat, the unpredictability of the environment, both in terms of weather conditions as well as the whales themselves, would influence the experience. Finally, and perhaps most importantly, events that reinforce the

experience weeks, months, even years later can serve to support and strengthen learning and understanding as we continue to build on prior knowledge and experience.

Several studies have considered the importance of advance preparation and orientation. Falk, Martin, and Balling (1978) looked at school children visiting Smithsonian's Chesapeake Bay Center for Environmental Studies. They found that the groups of children who were more familiar with wooded areas were better able to attend to the activities and spent more time on task than those children from urban areas who were unfamiliar with wooded areas. The unfamiliar group made more negative comments when the facilitator lead the group off the path, and were noted to be "rowdy, teasing, and not attentive to the task much of the time" (Falk et al., 1978, p. 132). Anderson and Lucas (1997) found that children who were given a 40-minute orientation about the background and layout of a science center three days before their visit performed significantly better on a post-test than the students who did not.

Rennie and McClafferty (1995) reviewed the literature and suggested the following guidelines in terms of preparing students for field trips:

- Before the trip, the teacher should visit the destination and plan pre-, on-site, and post-visit activities around the trip. Students should be oriented to the physical setting, the schedule for the day, objectives, and should be involved in the planning of the trip.
- During the trip, unfamiliar students should have time to orient themselves and settle down. They should be able to work together in groups if tasks are involved. Some unstructured time should be scheduled in.
- The authors claim the literature is lacking in this area, but that common sense says to reflect, present, report, and plan to investigate unanswered questions.

These guidelines are consistent with what research suggests, namely that students need to be prepared and oriented to the environment rather than being dropped down into a "learning" situation, only to be plucked up again two hours later with no meaningful connections to be made. The idea of psychological comfort folds into the idea of orientation; it is not uncommon for people to feel uncomfortable in new, unfamiliar, or unpredictable settings (Hein, 2004).

The physical context also includes the *physical* comfort of the learner (Hein, 2004); are the floors soft? Are there bathroom facilities close by? Does the environment meet the human need for stimulation without over-stimulating (Olds, 1990)? In the pilot study to this research, I found that visitors who were on the boat on one particularly rough day were much more likely to mention the weather and the conditions of the boat than those who were on the boat during calmer days. For example, one older woman said she was very aware of the railings positioned all around the boat that passengers clung to as they moved around the decks. Others mentioned how they were glad they did not get seasick, and even associated the weather with some of the behaviors of the whales.

The design of exhibits also comes in to play in the physical context. Of interest in the recent literature is object-centered learning in museums. Rowe (2002) wonders, is the goal of a museum "the transmission of accurate information about art, history or science, or is it to engage visitors in a way that validates their own knowledge, creates return visitors, or makes them critical consumers of other social texts?" (Rowe, 2002, p. 20) Is the primary goal to transmit knowledge, or to facilitate meaning-making? There are two almost conflicting functions of objects in museums (Rowe, 2002). The first is the *intended* use of the object. Usually there are signs that tell visitors what the museum wants you to know about, and how you are intended to interact with that exhibit. Using it in any other way is counter to the design of the exhibit. On the

other hand, the other function of objects in a museum is for the visitors to use them to make their own meaning and draw their own conclusions based on both the individual's and the group's interest, motivation, and prior knowledge, where the object becomes a thinking device through which the visitors generate meaning (Rowe, 2002). This is a good illustration of the difference between discovery learning (intended use) and constructivist learning, and how the design and intent of the museum and its objects do not necessarily correlate to how it will be used by its visitors.

One study took what might be considered to be standard objects found in an art museum and developed an exhibit called *Question*, designed to "challenge habitual ways of looking at, thinking about, and engaging with art objects" (Silver, 2005, p. 3). The paper describes the exhibit, which was designed around 20 questions such as "can we really understand art from cultures and time periods other than our own?" and "Is there such a thing as bad art?" The researchers talked to visitors on their way in about their expectations, and again on their way out. Interviews were based on visitor expectations, emotions, whether their behavior in the exhibit was similar to how they typically behave in an art museum, and if the exhibit had changed their views of art museums. Emotional reactions were both strongly positive and strongly negative. Those visitors who described themselves as frequent museum visitors did not believe the exhibit would change the way they thought about art museums because they already approached them inquisitively; those who described themselves as less knowledgeable about art often said they would approach art differently.

Interactive exhibits are becoming increasingly popular in museums, though there have been few studies that really explore the use of interactives and how they might support learning (Falk et al., 2004). The research that speaks to interactivity suggests that we do learn from interactives,

and in fact that people differentially choose to engage with different types of interactives (Falk et al., 2004; Hayes, n.d.; McCrory, 2002; Storksdieck, 2006). Most of these studies have looked at content knowledge, facts, and concepts, with one making a case for a more broad definition of learning:

...for example: learning as shifts in attitudes, values, and beliefs; aesthetic understandings; psychomotor skills, such as discovering how it feels to turn a pot or play an instrument; social/cultural dimensions such as learning about someone in your family; and process skills such as thinking critically and refining one's learning skills, or perhaps even learning more about how to use a museum for lifelong learning. (Falk et al., 2004, p. 172)

What's more, most of the previous research in this area looked at short-term learning outcomes. Testing visitors on their way out of a museum only finds out what they have remembered, not what they have learned (Falk et al., 2004). Reinforcing agents continue to assault us with new information days, weeks, months, even years after our initial visit that serve to help us build new understandings upon previous foundations. This aspect of the physical environment is difficult to assess, and requires a longer-term follow-up with participants.

Research in the physical context considers the surrounding environment. This could include the design of the environment and the intended message, how well visitors feel oriented and prepared for the experience, and even physical comfort factors such as temperature and safety. Research indicates that people who feel comfortable and secure in their surroundings, know what to expect, and know what is expected of them are more likely to be able to focus and construct meaning from their experiences (Dierking, 2002). Arguably, the reinforcing events that happen after an experience are as critical to learning as those that happen within the initial experience (Falk & Dierking, 2000). This area has been sporadically explored, but more research

is needed to gain a better understanding of how people continue to learn and make meaning as they are confronted with subsequent reinforcing events and experiences.

Looking Across Contexts

There have been a few recent studies that attempt to take a more holistic view of learning by looking across contexts. Stainton (2002) was interested in what connections visitors made in an art museum, and whether the visitors "got" the curator's intent. She looked at both personal (prior experience and knowledge of art in general, Africa, and museums) and sociocultural aspects of the art museum "to see how visitors are in dialogue with museums" (Stainton, 2002, p. 215). She conducted pre-and post-interviews with 26 visitors, and audiotaped one or two members of each group as they toured the exhibit. The two main messages of the show were aesthetic and anthropological. Most of the talk was about the exhibit content, though a consistent amount was about orientation. Visitors were making connections with new knowledge. Rarely was there talk that was off-subject (i.e. personal). Visitors found the visit to be both informative and personally meaningful, whether or not their take-away was consistent with the goals of the designers.

In an attempt to illustrate how the CML could be used as a framework to understand the role of context in learning, Dierking (2002) used the remembrances of a seven-year-old Irish schoolgirl who toured the Glens of Antrim in Northern Ireland two weeks prior to writing about her experience. Dierking outlines what she identifies as ten factors that are "particularly fundamental to experiences with and from objects" (Dierking, 2002, p. 7). They are: motivation and expectations; interest; prior knowledge and experience; choice and control; within-group sociocultural mediation; facilitated mediation by others; advance preparation; setting; design;

and subsequent reinforcing events and experiences. Dierking then applies these ten factors to the written narrative of the 7-year-old, giving examples from the narration to illustrate how these factors influenced her learning in that experience. Dierking concludes that "instead of asking, 'What did Sarah learn as a consequence of visiting Glens of Antrim Forest Park?,' we should be asking 'How did this experience contribute to what Sarah knows, believes, feels, or is capable of doing?'" (Dierking, 2002, p. 13).

In what they describe as the first full study to use the CML, Falk and Storksdieck (2005) were interested in how specific independent variables individually contribute to learning outcomes when not studied in isolation. They used pre- and post-tour interviews (with closed and open-ended questions, self-report, and test items) and observation. Each interview started with personal meaning maps, then open-ended questions, and finally multiple-choice questions. The same was repeated for the post-interview. The dependent variable was changes in visitors' understanding of life science. Twenty-four independent measures reflected eleven factors having to do with personal, sociocultural, and physical contexts. The researchers were looking at science learning that resulted from visiting one exhibit, World of Life. The researchers used three different measures of learning with each participant. One in three visitors improved their multiple-choice scores, about half showed improvement on the open-ended questions, and "large majorities" showed improved understanding through their personal meaning maps. All eleven variables showed small significant correlations to changes in science learning, with prior knowledge being the more important factor. The more visitors knew before, the less they learned from the experience. The converse was also true: the less they knew before, the more they learned from the experience. This study did not report any kind of long-term follow-up with the participants.

Extending the Time Frame

Traditionally, the standard method used to investigate learning in museums has been to do so within the walls of the museum, fixing it both physically and temporally (Storksdieck, 2006). More studies are incorporating a longer-term follow-up, contacting visitors months after the visit, and in a few cases, up to a decade or longer (D. Anderson, 2003; D. Anderson & Shimizu, 2006a, 2006b; Falk & Dierking, 1994). Proponents of long-term follow-ups believe that learning is ongoing as we continue to make connections, reflect, integrate, and experience life. It is not an instant in time, but a slow process of building and understanding. Therefore, investigating the effects of an informal learning experience must be an on-going process and not a one-time "measurement" (Rennie & Johnston, 2004).

Stevenson (1991) tracked visitors through a museum, interviewed them immediately after their visit, sent questionnaires a few weeks later, and then conducted in-depth interviews with the group six months later. He was interested in looking at the kinds of memories visitors were forming in the longer term. He found that participants had vivid recall of much of their visit, remembered details of what they did, as well as how they thought and felt. Most of their "thinking was concerned with 'effects' rather than 'explanations' or 'understandings', although quite often visitors related their experiences to what they knew already or had seen on television" (p. 530). Most memories were episodic (autobiographical, and experiential) in the short-term, but in the long-term there was some evidence that participants were forming semantic memories, which result from some kind of cognitive processing.

In what McManus (1993) characterized as a "longer-term" study, she sent 136 letters to recent visitors of *Gallery 33, A Meeting Ground of Cultures* in the Birmingham Museum and Art Gallery in the United Kingdom. Twenty-eight visitors responded to her very open-ended request

that they write about their memories of their visit to Gallery 33. The average duration from time of visit to response was 7 months, with the span being 2-10 months. The majority (N=19) of the responses came from children, most of whom had visited on field trips. The rest (N=9) were adults between 21-50 years of age. McManus found their memories fell into to four main categories:

1) [51 percent] objects or things (i.e. masks, interactive videos);

2) [23 percent] episodes or experiences (i.e. trying on masks, meeting friends in the museum);

3) [15 percent] feelings experienced or judgments made at the time of the visit (i.e. feelings about the design of the gallery, memories of enjoyment);

4) [10 percent] Summary memories based on past memories (i.e. memories that were generated as a result of reflecting on older memories, such as plans to come again, or "executive summary" memories where the visitor has shown some process of intellectual

judgment or rationalization about the nature and/or message of the exhibit). Falk and Dierking (1994) found some similar categories of memories, though distribution within those categories was different. They interviewed 128 participants about their memories of field trips taken during their early primary school years (grades one to three). Ages of the participants ranged from 9 years old to graduating college seniors. The researchers found that the overwhelming majority of participants were able to recall early field trips, and thought of them as positive social experiences. Further, many related experiences from their field trips as catalysts for pursuing certain academic subjects. Most of the participants said they had thought about the field trip since, and almost three-quarters said they thought about it frequently. They

found that there was evidence of subject-matter recollections in three-quarters of all reflections, though the researchers do not characterize the nature of those memories.

Relating to long-term memories from field trips, Knapp (2000) administered a survey with four open-ended questions one month and 18 months after elementary school students (N=25) went on 3-hour field trip to nearby forest and nature preserve. In what seems to contrast Falk and Dierking's (1994) findings, Knapp found that students' memories were general and non-specific. For example, students would say they remembered "learning about leaves," but specific aspects of what they learned were not elaborated on. This was true of both the 1-month and 18-month follow-ups. Students did however have a positive reaction to the experience in both follow-ups and expressed interest in learning more.

In the study by Falk et al. (2004) that was described earlier in this paper where they considered prior knowledge, interest, agenda, and perceptions of visitors to two different interactive museums, the researchers found that when interviewed immediately after their visit, visitors overwhelmingly reported changes in knowledge and skills as the primary learning outcome from the experience; to a lesser extent, changes in perspective and awareness; and by a small number of visitors, changes in interest and motivation. In the long-term however (four to eight months later), the changes described by visitors were predominantly in perspective and awareness outcomes. Few mentioned skills and knowledge or interest and motivation in the long-term, however social learning was commonly cited as a long-term learning outcome. This again reinforces the idea that we cannot generalize on long-term impact by looking at short-term outcomes.

In what might be one of the longest long-term studies to date, Anderson (2003) conducted face-to-face interviews with individuals who had visited World Expos in 1986 (Vancouver,

Canada) and 1988 (Brisbane, Australia) 15-17 years after the event. Memories of social context dominated the participants' recollections, most frequently pertaining to conversations and social experiences, such as eating together, talking in lines, etc. The visitors' social identity at the time of the visit had a deep influence on their memories, leading Anderson to conclude, "who you are largely determines what you are able to see and perceive, and what you ultimately recall after the experience" (D. Anderson, 2003, p. 417). Anderson defined different sociocultural identities of the participants, including Young Mother Culture, Young Child Culture, and Adolescent Culture, among others. These cultures defined the participants' memories. For example, those who were members of the Young Mothers' culture at the time of their visit were able to describe in detail memories of the family group. Rarely did they have any memories of exhibits or displays. This was true actually of all the groups, where less than twenty percent were able to describe the displays in any detail, even with in-depth probing. Frequency of visits or duration seemed to have no bearing.

It is difficult to say how much time is necessary before a study can be considered longterm. One never knows when an event in life will trigger a memory or elaboration. It might happen a month after the event, a decade after the event, or even longer. Still, widening the lens to consider the experience as merely one part of a lifetime of learning can help us shift our focus to longer-term outcomes that relate more to a life-long learning agenda.

Researchers are now beginning to look across contexts and to understand that learning continues to happen over a period of time after the initial experience (Dierking, 2002; Falk & Storksdieck, 2005; Storksdieck, 2006). While this line of research is being seen more and more often in museums, there is the need to extend a similar line of research into informal education in

natural environments, which are arguably more complex due to the fact that they are less predictable than contrived settings such as museums, but equally at the mercy of individual differences. By taking a more holistic view of the learner and the many factors that influence the learning that happens in these natural environments, we can have a better understanding of the experience itself, the experience of the learner within that setting, and how the learner continues to elaborate on that experience as time goes by.

Summary of Context and Informal Learning Literature

Much of the research in terms of the personal context has involved the role of interest, prior knowledge, and background characteristics. Several studies have indicated that high levels of interest play a critical role in learning outcomes, especially when those with high interest have low prior knowledge; in other words, those with low prior knowledge probably have the most to gain from the limited amount of information offered in any given museum exhibit, but interest seems to play a critical role in this potential.

Research in the area of sociocultural interactions has focused for the most part in two main categories: interactions between communities of learners (i.e. school groups, peer groups, or most commonly, family groups), and interactions between visitors and outside mediators (i.e. museum educators, teachers, field guides, interpreters). Within communities of learners, researchers found that when visitors were allowed and encouraged to interact with each other, they tended to spend more time at each exhibit, to try to use the exhibit in different ways, and outperformed those who did not interact with others. However, with adult-child dyads, these interactions did not always necessarily lead to learning; children might complete the experiments without actually understanding them.

Research into the interactions between visitors and outside mediators appears to indicate that the facilitators can have an impact on both the learning and behaviors of visitors, especially when the facilitators are engaged with the learners and give them concrete ways to change their behaviors. One group in this area that seems to miss out on some great learning potentials are students on field trips, who often experience these excursions as a day off rather than an integrated part of their curriculum.

Many studies have spoken to the importance of advance preparation and orientation before encountering a novel experience or setting; failure to do so can result in discomfort, or a period of time where learners are unable to attend to the experience because they are trying to orient themselves to a novel situation. Further, the design of the exhibit itself has an impact on what the learners take away, as well as how the learners approach the learning situation.

Recently researchers have started to look across contexts to take a more holistic view of these potentially rich learning experiences. Even more importantly, researchers are beginning to widen the lens through which they view the experience to a more long-term approach, taking snapshots of the learner before, during, immediately after, and long-term (or "longer-term"). Just how long after the experience qualifies as "long-term" is open to debate; any follow-up after an experience would be just a snap-shot of the learner at that time, realizing that the potential for learning never ends.

While researchers are starting to take a more holistic view of learning, both in terms of contexts and time frame, more research is needed in this area. At this time, most of the studies in informal learning continue to be one-dimensional and look at a moment in time, though that trend is certainly starting to shift, particularly in the area of museum learning. This was not seen

to be the case in learning research in natural settings or in the environmental education literature. This study contributes to this area of research.

Indicators of Learning

In this section I will discuss how informal learning researchers have measured or assessed learning and what they have found about the effectiveness of those measures. Over the years, researchers have come up with innumerable ways to measure impact, from Anderson's famous noseprints on the glass research (1968) to measuring wear patterns on the floor in front of certain exhibit components (Webb, Campbell, Schwartz, & Sechrest, 1966). In recent years, measures have reflected a number of different epistemologies as well as goals. Some are interested in short-term outcomes; others are interested in long-term impact. Some are interested in what content and skills visitors gain from an experience, others are interested in how visitors make meaning from experiences. As such, researchers have used many different kinds of methods to try to get at this data. These methods can be placed into two categories (based on Hein, 2004): observation methods and language-based methods, each of which allow for the consideration of traditional as well as alternate outcomes.

Observation Methods

Tracking and timing studies have been the backbone of museum research and visitor studies for decades (Hein, 2004). Tracking studies involve spatially tracking visitors though the exhibits, noting their paths and where they stop. Timing studies can include the amount of time spent in each exhibit, at each exhibit component, as well as what activities visitors are engaged in and for how long. Often timing and tracking are used together. Pioneered by Robinson and Melton in the 1930's (Hein, 2004), this research indicates that visitors follow specific paths through exhibits; they spend a relatively short amount of time in front of each exhibit

component; they stop at only a fraction of the exhibits; and after about 15-20 minutes, they start spending even less time at each exhibit and stop at fewer exhibits as museum fatigue sets in (Hein, 2004).

Another form of tracking is naturalistic observation. With this method, groups are usually followed for the length of their entire visit in order to see what happens when a family, school group, and other visitors experience some informal learning environment (Hein, 2004). What researchers have concluded is that the average length of time spent in a museum is two hours, though only about 30-60 minutes of that time is spent with the exhibits; the rest of the time involves orienting, eating, shopping, and bathroom visits.

Language-based Methods

Hein (2004) claims that language-based methods take "advantage of the amazing human property of speech—either talking with people about their activity or asking them to write about it" (p. 101). A variety of language-based methods have been used to consider indicators of learning, and these seem to vary in scope to reflect the researcher or evaluator's epistemologies. Multiple-choice tests are one traditional way to "test" how much the visitor has learned. Often used with pre- and post-visit tests, the researchers seek to learn how the visitors' content knowledge has changed as a result of the experience (Hein, 2004). These types of tests however can undermine the richness of a museum visit, and research has indicated that short-term learning outcomes are not good predictors of long-term impact (Falk et al., 2004; Stevenson, 1991; Storksdieck, 2006).

More and more, researchers are looking to the words of the visitors themselves, whether they are verbal or written. Falk and his colleagues (Falk et al., 2004; Falk & Storksdieck, 2005) have used personal meaning mapping (PMM) to help participants describe their conceptions.

Derived from concept maps, participants are asked to brainstorm about a certain topic before their visit, and are then asked to revisit their PMM afterwards to see if there is anything they would like to add or change.

Today timing and tracking techniques are often used in conjunction with other methods, such as recording visitors' conversations as they move through the exhibit. This method was used by several members of the Museum Learning Collaborative (MLC) (Allen, 2002; Fienberg & Leinhardt, 2002; Stainton, 2002) as detailed in their book, Learning Conversations in Museums (Leinhardt, Crowley et al., 2002). In each of these methodologies, visitors or groups of visitors were audio-recorded as they moved through the exhibit while observers shadowed the participants, making note of where they were and how much time they spent at each exhibit component. Thus the researchers were able to capture in "real time" visitors' conversations (Allen, 2002), putting the "social act of conversation" (Leinhardt & Crowley, 1998, p. 16) at the fore, and using timing and tracking as a way to essentially relive the experience of the visitor as they moved through and talked about their experience.

Another written form of language reflection being used is journal entries and reflections. One researcher (Ferreira, 1998) asked participants on three, five-day hikes to keep daily diaries where they were to record what they liked and disliked each day on the trail. Another study asked participants to visit museums and then write up a diary account of three to five pages after each visit (Leinhardt, Tittle et al., 2002). They were also encouraged to include relevant artifacts from their visit. Instead of focusing on conversations, these methods puts the private thoughts and inner conversations at the forefront of analysis (Leinhardt, Tittle et al., 2002).

When discussing long-term studies, memories and reflection are often the only means we have to access long-term impact. According to Hein (1999), "memory may be a better indicator

of cognitive change than short-term recall of what must necessarily be rather superficial information" (p. 129). Anderson (2003) found that 15-17 years after the event, visitors still had vivid memories of some aspects of their experience, though those memories tended to have more to do with the participant's identities at the time of the experience than actual memories relating to content or design. Research in this area is insubstantial but growing; the conclusions drawn so far vary in terms of what types of memories visitors have and how they elaborate on those meanings, however all of the research seems to indicate that these are memorable experiences and a valuable way to access long-term effects (D. Anderson, 2003; Falk & Dierking, 1994; Knapp, 2000; McManus, 1993; Stevenson, 1991; Wolins, Jensen, & Ulzheimer, 1992) *Summary of Measures of Learning*

Timing and tracking studies have indicated that visitors spend a rather short amount of time in museums; stop at a fraction of the exhibits, and that the amount of exhibits visited and time spent on each decreases the longer visitors are in the museum. More recently, time and tracking methods are being combined with language-based methods, which range in methodology from multiple-choice exit exams to diary entries to listening in on visitor conversations. These methods reflect the intent of the researchers; some wish to know the immediate impact of an exhibit on a visitor's knowledge, others might want to know the inner conversations and private thoughts of visitors, and still others might be interested in the social act of conversation. Some are interested in short-term learning, which others might be interested in the role of memories long after an experience. As such, the means that researchers have used to measure learning directly relates to what they wish to learn about the experience.

Conclusion

I began this review by indicating that I would use the existing literature to answer the following questions:

- How do different environments for informal learning intersect and parallel, and in what ways are they unique? How can what we know about learning in one environment inform the other?
- What learning theories are most relevant to informal learning?
- What does the literature say about the role of context, how it has been studied, and what has been found in terms of learning in informal environments?
- How have informal learning researchers typically measured or assessed learning and what have they found about the effectiveness of those measures?

As this review has demonstrated, there are three areas of informal learning research that inform this review: museum research, environmental learning in natural environments, and freechoice learning. Each of these areas contributes to the body of knowledge necessary to gain a more complete understanding of the proposed research. The learning theories emphasized in these bodies of literature tend to fall into the categories of constructivist and sociocultural theories of learning. These theories, in turn, inform the Contextual Model of Learning, used by Falk and Dierking (2000) as a framework to understand the complexities of learning in terms of context.

Informal learning is a complicated phenomenon both in terms of what effects learning in any given situation, how learning continues to evolve over time, and how to assess that learning. Falk explains that:

A good learning study should provide an appropriate mix of close-ups and panoramas, it should capture sufficient detail to explain the processes that the individual is engaged in, while at the same time capturing longitudinal aspects—flashbacks and fast-forwards—that allow the learning experience to be situated within a larger context in order to make sense of why and what learning occurred. (Falk, 2004, p. S90)

This indicates the need to look at the big picture, to not look at a given experience as an instance of learning. Rather, we need to look at who the learners were before, what they did during their experience, and what continues to happen as a result of their experience days, weeks, months, even years later (Falk, 2002; Rennie & Johnston, 2004).

We are beginning to have an understanding of the importance of the personal, sociocultural, and the physical contexts, and realizing that the effects of a learning experience can continue to be felt and expanded upon long after the initial experience. What we are only beginning to explore however is how these three contexts relate, interact, and influence one another. As research in informal learning has just begun to take a more holistic approach towards learning in museums, the literature is lacking in a similar approach in terms of learning in natural environments, such as the site used in this research. This study could provide a valuable contribution to the literature in terms of environmental education and free-choice learning, taking a holistic view of the learner and the learning situation in both the immediate and long-term.

CHAPTER THREE: METHODOLOGY

Introduction

The purpose of this study was to explore the role of *personal, sociocultural, and physical contexts* on the short- and long-term experiences of adult participants in a natural, informal learning environment. Given the exploratory nature of the study, a qualitative research design was used. According to Bogdan and Biklen (2003), qualitative research is defined by five features, all of which were consistent with the goals of this study:

- Naturalistic inquiry. Qualitative studies take place through observation and immersion in the setting of interest. This study was concerned with learning in context and took place in a natural setting.
- 2. Descriptive data. Qualitative research is descriptive; it uses words instead of numbers. In this study I used interviews and participant observation as sources of data.
- 3. Concern with process. Qualitative researchers are interested in how things came to be (process) rather than just being interested in the end result (product). While this study examines short- and long-term learning outcomes, it is the process of how the learners arrived at these outcomes, and the contextual factors that influenced these outcomes that are of primary interest.
- 4. Inductive analysis. Qualitative researchers do not seek to validate hypotheses; rather the theory is grounded in the data and tends to emerge after time has been spent in the field and with the participants. In this study I sought answers to open-ended questions, and not to prove or disprove a particular theory.

5. Meaning making. Qualitative researchers are interested in learning their participant's perspectives and how they make sense of their experiences. These goals are consistent with the purpose of this study.

These five features were in accordance with the goals of the study, as is Denzin's (2001) description of how qualitative research seeks to understand real-world situations in depth and in detail:

It goes beyond mere fact and surface appearances. It presents detail, context, emotion, and the webs of social relationships that join persons to one another. It enacts what it describes. Thick description evokes emotionality and self-feelings. It inserts history into experience. It establishes the significance of an experience or sequence of events for the person or persons in question. In thick description the voices, feelings, actions, and meanings of interacting individuals are heard, made visible. (p. 100)

As the researcher, I immersed myself in an authentic setting in order to understand how my participants' personal characteristics, their interactions with others, and the physical environment itself influenced how they interpreted and made meaning of their experience. Using a qualitative research methodology was appropriate for this study because it provided the opportunity to explore this phenomenon in-depth.

Research Design

A fundamental belief of qualitative research is that individuals construct reality as they interact with the world (Merriam, 2002). This idea is central to what Merriam calls *basic interpretive qualitative research*, and is grounded in constructivist philosophy. Such researchers are interested in the meaning that people make of a situation or phenomenon: "(1) how people

interpret their experiences, (2) how they construct their worlds, and (3) what meaning they attribute to their experiences" (Merriam, 2002, p. 39).

Basic interpretive qualitative research is informed by phenomenology and symbolic interactionism (Merriam, 2002). Merriam (2002) explains that "from phenomenology comes the idea that people interpret everyday experiences from the perspective of the meaning that it has for them" (p. 37). The foundational question of phenomenology is, "What is the meaning, structure, and essence of the lived experience of this phenomenon for this person or group of people?" (Patton, 2002, p. 104). The goal of the researcher is to understand the essence of a human experience, as described by the participants themselves (Creswell, 2003).

Symbolic interactionism is concerned with an individual's interpretation of meaning as an individual interacts with society, making the *self* a social construction (Merriam, 2002). The foundational question of symbolic interactionism is, "What common set of symbols and understandings has emerged to give meaning to people's interactions?" (Patton, 2002, p. 112). This approach places an emphasis on in-context interpretation of social interactions (Merriam, 2002; Patton, 2002).

The interpretive approach was appropriate for this study because its foundations are in keeping with the theories that framed my research, namely a sociocultural theory of learning, which is based on the concept that "human activities take place in cultural contexts, are mediated by language and other symbol systems, and can best be understood when investigated in their historical development" (John-Steiner & Mahn, 1996, p. 191). This theory complements the approaches that inform interpretive research and focus on the construction of knowledge in the three contexts that guide this study: personal, sociocultural, and physical.

While an interpretive approach was used, this study also borrows elements of what Yin calls an embedded case study (Yin, 2002). In an embedded case study, there are multiple units of analysis. In this case of this research, the results from Phase 1 are presented in two parts: the groups themselves are one unit, and cross-case analysis is the second unit. Likewise in Phase 2, the individuals interviewed are one unit, and the cross-case analysis is the second unit. The purpose of using multiple units of analysis for this study is to present the uniqueness of each case, particularly those themes present within the smaller case units that still warrant discussion, but would not be represented when looking for themes across case.

Description of Pilot Research Project

The research study presented here was built from a pilot study that began in the summer of 2005 in Gloucester, Massachusetts. The purpose of the pilot study was to explore short-term and long-term changes in learning, attitudes, and beliefs as a result of a free-choice learning experience on a whale watching excursion off the coast of New England.

The research questions posed in the pilot study were:

1. What motivates people to go on a whale watching trip? What types of goals do they have for their visit?

2. What are both the short-term (immediate) long-term (3-6 months later) learning outcomes of the trip?

3. In what ways do visitors continue to elaborate on their experiences, and how does their learning transfer to their everyday lives?

This pilot study began as a project for a class in which I was enrolled during the summer of 2005 called, *Discovery Retreat: Learning and Teaching in the Context of Whales*. This eightday intensive course, informally referred to as *the Whale Class*, "promotes environmentalism
through the practice of contextual teaching and learning among teachers and their students" (The University of Georgia, 2005). Under the direction of Dr. John Schell, each summer a group of educators traveled to Gloucester, Massachusetts where they participated in morning class sessions that focused on themes such as situated cognition, reflective practice, constructivism, environmental science, and communities of practice. In the afternoon, the students became educators on-board a commercial whale watching boat, owned and operated by Captain Nick's Whale Watch (pseudonym).

The participants in the pilot study were adult passengers on a whale watching boat. Captain Nick's offered an informal but comprehensive on-board educational program integrated into the whale watch activities that promoted the idea that education is the key to conservation, and provided hands-on learning tools for both adults and children to learn about the whales, the ocean environment, and some of the problems faced by the whales due to fishing and environmental factors.

Before the experience, passengers were interviewed (alone or in small groups) about why they came on the trip, their goals and expectations, prior knowledge, and any previous whale watching experiences. On the trip back to the harbor, the same passengers were again interviewed to find out what they thought of the experience (in terms of expectations and surprises), what they thought they learned, and if the experience evoked any feelings. Ten passengers were interviewed over the course of one week.

These same passengers were individually contacted by phone six months after their trip to explore any long-term impacts that resulted from the whale watch experience. The interviews included questions about their conversations with others about their experience, interactions with

others, books read or documentaries watched, as well as attitude changes, behavioral changes or intentions.

Analysis of the data was guided by Ruona's (2005) method, which involves using Microsoft Word to organize all of the data into a table, allowing the researcher to break the data into meaningful and discrete segments, to tag and code data, and then to sort the data in a variety of ways. Repeated review and constant comparison of the data are integral components of this data analysis method. In total, 54 codes were generated and ten themes were derived from the analysis (see Appendix A).

Analysis of the pilot study data indicated that before the whale watching began, participants' expectations were largely tied to their previous whale watching experiences, or the experiences of others with whom they had spoken. Most of the veterans expressed that they wanted a trip that at least equaled a previous successful trip, or wanted to see something new. One couple who had been on dozens of trips in the past had a different view; "I try to come out with the expectation of a great boat ride, and then if I see anything that's just a bonus, and I haven't been skunked yet." Sometimes passengers had very specific hopes, such as "I hope they go under the boat. I've heard of them doing that but I've never seen it," or "I want to see some breaching." Others were content just to "see one in person. It will be a great and strange pleasure." Several visitors mentioned highlights of previous trips and their expectations and hopes based on those trips. Memories of previous trips included breaching, whales going under the boat, bad weather, uneventful trips, and trips shared with friends or families.

Interest before the trip was varied, from one participant saying "I have enough interest, somewhat;" to a mother/daughter who termed it a yearly pilgrimage; to a couple who had already been on five or six that season. Passengers said their interest came from a variety of sources,

from an elderly woman who read Moby Dick as a teenager, to a participant who watched Jacques Cousteau with her father when she was a child.

Results of the study indicated that short-term learning (immediately following the experience) focused largely on gains in content knowledge and the value of the lived experience, and recognition of the emotional impact of the experience. When asked what they felt like they learned from the experience, participants related specific details they had learned during the trip, such as social and feeding behaviors of whales, the different kinds of whales they saw, and how seeing them in person was a unique experience. This was a common sentiment echoed by many of the passengers. When relating it to documentaries, one passenger said, "they edit those films down to just the spectacular moments, but I've never gotten that excited before. There is something to be said for feeling the spray, hearing the blow. It sounded like a horse exhaling."

When asked how this trip and seeing the whales made them feel, the passengers shared a number of feelings and emotions in the affective realm, saying it was therapeutic, calming, exciting, intense and renewing, and that they felt joy, wonder, awe, satisfaction, happiness, and serenity. Less common were disappointment and feeling spoiled from previous trips.

Results of the pilot study indicated that long-term learning fell into the categories of emotional impact, increased attention, and changed perceptions. During a follow-up interview, one passenger pointed out that for her, there was more of an "emotional resonating rather than an intellectual resonating." Passengers explaining the emotional impact often used the same descriptors in the long-term follow-up as they did immediately after the trip; time did not seem to dampen at least the memory of their affective reaction to the trip.

Immediately after the trip, many of the passengers had expressed the interest to learn more about something they had learned about during the trip. While none of the passengers I

spoke with six months following the experience specifically sought out information, they did admit to paying more attention to environmental issues, particularly those that related to the ocean; "things that I don't think I wondered about before I find myself wondering about now." This sentiment was echoed by another passenger:

I think my ears perk up more when I'm watching the news, or reading the newspaper or picking up any kind of science magazine or something I think I do tend to pay a lot more attention to anything that has to do with the ocean and the marine life now where I might have glossed over it before, now I find myself really curious.

Another passenger said she had been interested in whales and the ocean environment ever since her trip, and that her perceptions had changed also:

Those crazy people who go out and um, you know block naval vessels and fishing vessels don't seem quite so extreme anymore. I don't think I'm going to be jumping onto a boat myself, but I feel like I'm a lot more sympathetic to them now.

Modifications Based On Pilot Study

The current study extends the research from the pilot study, being attentive to the contextual factors so as to explore their role on the learning experience of adults in this informal learning environment. As a result of the pilot study, I modified the design in the following ways.

- In the pilot study I failed to collect information that I later felt was important to have a better understanding of my participants and some of the personal characteristics they brought to the situation (e.g., educational level, age, gender, prior experience and interest). Therefore, I added a participant information form, which I asked each participant to fill out after signing the consent form.
- 2. Due to my concern that the "dock talk" had influenced the passengers' expectations

during the pilot study, I changed the timing of the preliminary interview to happen before the passengers boarded the boat, or at least before they heard the "dock talk" by the naturalist.

- 3. During the pilot study I did not try to audio-record participants for fear that the sound quality would be poor due to the wind and engine noise. With this study, I did audiorecord the interviews in addition to taking interview notes, using a variety of microphones depending on the noise levels and conditions.
- 4. It became apparent to me during analysis of the pilot study data that the physical characteristics of each trip were unique and played a role in the passengers' experiences. Such physical characteristics included the weather conditions, roughness of the water, amount of whale activity and their proximity to the boat, variety of whales seen, as well as other unforeseen factors. To better account for these conditions, I added a data table that I filled out daily to account for the unique characteristics of each trip.
- 5. I added a variety of questions to my interview protocol that reflected some of the findings from the pilot study so that I could probe more into specific areas. Additions/changes included:
 - a. Pre-trip interview: Asked about expectations and prior experience
 - b. Post-trip interview: Asked about interactions with others while on the boat (passengers, educators), expectations, plans for further action.
 - c. Phase 2 (long-term) interview: Asked about any changes in behaviors, attitudes, attention.

Site and Participant Selection

Research Site

The study took place on a commercial whale watching boat north of Boston, Massachusetts. The boat held up to 250 passengers, was 115 feet long, and had an upper and lower deck for viewing. The lower deck had a large, heated indoor cabin/galley with seating for 85 where they served food and beverages. Each excursion lasted approximately 3-4 hours, and each trip included between 100 and 250 passengers (see Appendix B for photographs).

In addition to the captain, there was a naturalist on-board who narrated the trip over a public-address (PA) system. The naturalist was positioned on the bow of the top deck and, with the help of several interns, spotted and pointed out whale sightings to the passengers. The naturalist supplemented the sightings by answering questions, and offering just-in-time information about the ocean environment, whale behaviors, and specific information about each individual whale that had been sighted.

The whale watch had an integrated informal educational program that provided hands-on learning tools to assist children and adults in learning about the whales, the ocean environment, problems faced by the whales and others in the food chain, and what could be done to help reduce or prevent these problems. There were three interns on-board each trip to facilitate the education program. The interns were high school and college students, and recent college graduates with an interest in environmental education, marine biology, psychology, or environmental science.

The internship program gave the interns experience in both education and science. During the twenty to sixty minute trip out and back in to the harbor, the interns acted as on-board educators and provided hands-on learning tools for both children and adults. For example,

passengers could hold a whale tooth or baleen in their hands, listen to whale songs, look at a 3D model of Stellwagen Bank, or play a game matching fluke (tail) markings. Once the actual whale watching began, the interns joined the naturalist to collect information on whale behaviors and identification.

During this particular week, there was also a group of educators from The University of Georgia onboard. These students were associated with a course called *Discovery Retreat: Learning and Teaching in the Context of Whales.* In fact, this is the course that originally brought me to this site the previous year when I conducted the pilot study previously described. Just as I had done the previous year, the students of this class became onboard educators and participated in the informal education program by visiting with the passengers, sharing information and artifacts, and answering questions. Because the passengers did not distinguish any difference between the interns and educators, and because both groups served a similar role on the boat in terms of their interactions with the passengers, the interns and educators will collectively be referred to as *educators* hereafter.

Participant Selection

The focus of data collection was eleven adult passengers onboard a whale watching boat based out of Gloucester, Massachusetts during the summer of 2006. Several logistical factors influenced my selection of participants. First, because I was interested in speaking with adult passengers, I only approached passengers who were in adult-only groups Second, I wanted to limit group size to no more than three, both because I was concerned that the interview would take too long with more than three participants given the time constraints, and because I know from experience than transcribing more than three voices from an audio recording can be difficult, and wanted to be sure that I could attribute each voice to its proper owner. Third,

because some of my questions involved social interactions, I chose to speak with groups rather than individuals.

Given these constraints, it was rare that I had to make a choice between which group to approach. For the most part, I chose the first qualifying group that presented themselves at the dock, ready to board. With only one exception, every group that I approached agreed to participate. The group that refused had a member who expressed discomfort in being audio recorded.

Data Collection Methods and Procedures

Interviews

Data were collected primarily through interviews. The interviews took place in two phases. Phase 1 consisted of two interviews, both of which occurred on the day of the trip. The first interview often started on the dock before boarding, and concluded aboard the boat, before leaving the harbor. The second interview was conducted on the return trip. Each interview lasted between ten and thirty minutes. The timeline in Table 3.1 is an example of a typical afternoon trip.

Time	Passengers	Researcher
1:00 PM	Passengers began to line up on the dock to board the boat	I solicited passengers to participate in the study, began the informed consent
		procedure, and began the pre-tour
		interview.
1:15	Passengers boarded the boat	First interview continued and concluded.

Table 3.1. Timeline For Typical Afternoon Trip

Time	Passengers	Researcher
1:30	Naturalist gave "dock talk" to acquaint passengers with rules of boat and overview of the types of things they might see.	
1:40	Boat left the harbor	
1:55	Passengers moved about the boat, got food or drinks from the galley, sat on the outside decks, napped, socialized, interacted with educators and/or other passengers.	
2:35 – 4:15	Whales were spotted. Boat slowed or stopped while passengers watched the whales.	
4:15 – 4:45	Passengers moved about the boat, got food or drinks from the galley, sat on the outside decks, napped, socialized, interacted with educators and/or other passengers.	I approached the same participants, conducted the post-tour interviews, and again asked permission for a possible follow-up in the future.
4:45	Boat pulled into harbor	
5:00	Tour concluded	

 TABLE 3.1 Timeline for Typical Afternoon Trip (continued)

After agreeing to the on-site interview and signing the participant consent form (Appendix C), participants were asked if they would be willing to speak with me again "at a later time" if I had any follow-up questions. All participants agreed and were asked to check the appropriate box on the demographic form (Appendix D) and to supply contact information. Upon examination, I realized after the first day of data collection that one member of the group I interviewed that day had checked the box indicating they would *not* be willing to talk with me again. I decided not to include their data in the analysis because of this fact. Subsequently, I checked the demographic form before each interview to confirm that the written intentions agreed with their verbal agreement. Table 3.2 presents the participants this study in their respective groups, including both Phase 1 and Phase 2. Pseudonyms are used for all participants.

4		
Participants	Phase 1	Phase 2
Group 1	Sheryl	Sheryl
	Patsy	
	Mary	
Group 2	Rita	Rita
	Max	Max
Group 3	Bryan	Caron
	Caron	
Group 4	Susan	
	Jay	
Group 5	Walt	Walt
	Kat	

Table 3.2. Participants In Phase 1 and Phase 2 Interviews

The second interview phase took place approximately six months after their trip. Before conducting Phase 2 follow-up interviews with my participants, I conducted a "practice" interview with a friend who had been on one of the whale watches that summer. I had two main reasons for doing this. First, I wanted to check the interview protocol to ensure that the questions were clear and in a logical order. Second, I wanted experience with the protocol so I would be more comfortable during the actual interviews. As a result of this practice interview, I modified the wording of a few questions, added a few more, and changed the overall order to ensure a more logical flow.

Six months after the trip, I contacted all eleven of the participants by email to ask if they would be willing to talk with me one more time. Rita responded within an hour of my initial email and we arranged times for me to call both she and Max when they would not be in the house together. Walt and Sheryl each responded within a few days of my initial email, each agreeing to participate. After a follow-up email, I heard back from Caron, who agreed to an interview, but said that her husband, Bryan, was too busy to do so. Mary and Patsy both responded after my second email and a phone message and agreed to an interview but requested that I email their questions for them to fill out when they had time, rather than a phone interview.

I emailed them the questions, but never heard back from either of them despite repeated email prompts and a phone message. Three participants, Susan, Jay, and Kat, never responded to any of my email requests or phone messages.

In the end, five participants agreed to a phone interview and these were conducted in January and February of 2007. These interviews were recorded with the participants' consent (see Appendix E for interview protocol) and transcribed verbatim.

Naturalistic Observation

The hallmark of naturalistic observation is that it takes place in the field, situated in the natural setting of interest. The purpose of observations is to describe the setting, the activities taking place, and the people participating in those activities (Patton, 2002). Patton describes several advantages of direct observation. The researcher can get a better understanding of the context by being there; "firsthand experience with a setting and the people in the setting allows an inquirer to be open, discovery oriented, and inductive" (Patton, 2002, p. 262), which also lets the researcher rely less on prior conceptions. Another important aspect is that the researcher has the chance to discover things that the participants did not see as important, did not notice, or did not want to talk about in interviews.

During and after each trip I took field notes regarding information about the day, including weather conditions, whale sightings/activities, participant information, and miscellaneous notes and comments. These notes I either wrote on a chart or recorded on my digital recorder. After each trip I compiled these notes into a chart such as the one in Table 3.3.

Table 3.3. *Daily Conditions*

Date: 7/11/2006	Time: 1:30-5	Naturalist on board: Vivian
Weather Conditions:	Temperature:	Waves:
Choppy/rough on the way out and while	Cooler on the	Large swells, very rocky when
watching. Pouring rain on the way in,	water.	broadside the waves. Difficult to
rolling waves, hurricane-force winds.		move around the deck.

Sightings/Activity:

I was convinced this was going to be a lousy day. It was rough and windy, and we never seem to see any feeding behaviors when it is rough. We went quite a ways out, stopped once or twice on the way to watch a few humpbacks logging, and ended up upon a mother and calf. The mother was tail flapping (her tail WAY out of the water, slapping the water over and over again), and the baby was flapping her pectoral fins, first one just slapping, then she'd lie on her back and flap them both. It just seemed like she was playing. Then she started breaching. She'd do a little flapping, then go down and come up in a full breach. She must have done this at least 6-8 times, flapping, breaching. It was really great. Speculating that they were either communicating with each other, or maybe the calf was just playing around while her mother fed.

Participants: Mary, Patsy, Sheryl

These women were great. All in their late 30's or early/mid 40's, they were on their way to pick up the kids of Mary who were at camp in Maine. Had been friends for a long time, mentioning their camp nicknames. Varied widely in their interest and knowledge in whales, but all genuinely seemed to be enjoying the experience together. They were the first ones on the boat, and staked their spot on the very front seat of the bow of the boat. They each brought big tote bags full of stuff - cameras, crackers, misc. They mentioned their fear of seasickness a few times and all were wearing patches. They stayed at the bow, sometimes sitting and sometimes up against the front rails. They were very attentive when the educators came around, asked lots of questions, and kept talking to them for quite a while, not just asking questions about whales, but also asking the educators about themselves. On the way back to the harbor when everyone else went in because of the wind and impending bad weather, they stayed out until the captain asked them to go in because of the huge storm ahead. They ended up finding a small area by the heads where they could be outside, watching the storm with a little shelter overhead. They seemed to have loved the adventure of the storm, citing it several times as one of the fun things about the trip. Because of the weather, I asked them to stay behind after the trip, which they did. We chatted in the galley cabin while the crew cleaned up

Other Comments/Notes: Left early because of massive storm over Gloucester. Captain went about 25 minutes out of his way to go around the storm, then had to wait a while at the harbor entrance because visibility was so bad. We could see the wall of the storm as we approached, and everyone was asked to go inside the cabin and they closed the port side door. I stood in the starboard door and watched. A fascinating day! We had hurricane-strength wind. Waves were really high, very exciting as we waited through the storm in the pouring rain. Golf ball size hail in Gloucester and Salem, and a funnel cloud was seen nearby.

Artifacts

Artifacts are one way to capture elements of the physical environment. The whale watching boat had educational resources throughout the cabin area available for passengers. The nature of these resources varied and included information about individual species of whales, recycling efforts, ocean litter, and geological formations (see Appendix F for examples). These resources were available for the passengers to peruse at their leisure. Another source of artifacts came from the hands-on educational tools. Unlike the aforementioned resources, the educators facilitated the use of these tools. Together, these educational tools made up an important part of the informal education that was offered onboard the boat.

Photographs were another form of artifact I used to capture the essence of the physical environment. This includes pictures of the boat and the participants, the whales themselves to show the particulars of the whale watch (how many and what kinds of whales we saw on that particular trip, how close they were to the boat, behaviors, etc.), weather conditions (sunny, rainy, rough or calm water), and other aspects of the environment.

Summary of Data Collection Procedures and Schedule

In order to gain a more complete understanding of the visitor experience, I collected three types of data for this research: interviews, observations, and artifacts. The interviews provided the majority of data represented in the findings. The initial phase of interviews took place on the whale watching boat during the week of July 8, 2006. During this phase, small groups of participants were solicited from passengers on each trip. Willing groups were interviewed two times: once before the actual whale sightings (beginning on the dock and continuing before leaving the harbor), and once immediately following the watch either on the ride back in to the harbor, or after docking. During the rest of the trip, I observed the participants and their

interactions and behaviors while on the boat, both during the whale watch and during down time. Further, I collected samples and photos of the educational artifacts around the boat that were available for passengers. The second round of individual interviews (Phase 2) took place by phone approximately six months after the initial set of interviews. Figure 3.1 shows the timeline of data collection for this study.





Figure 3.1. Data Collection Timeline of Phase 1 and Phase 2 Interviews

Data Analysis

Data collection and data analysis occur simultaneously in qualitative research (Merriam,

1998):

Analysis begins with the first interview, the first observation, the first document read. Emerging insights, hunches, and tentative hypotheses direct the next phase of data

collection, which in turn leads to the refinement or reformulation of questions, and so on.

(p. 151)

Data collection for this study occurred in two phases (see Figure 3.1 for overview). Phase 1 involved pre-trip and post-trip interviews. Phase 2 involved follow-up interviews that took place six months later by phone.

Preliminary data analysis was ongoing during the first phase of collection and involved the following steps (Merriam, 1998):

- 1. Interviews were transcribed either the night of the interview, or the next morning before the next whale watch.
- 2. Research questions were modified and revised in light of the previous interviews.
- As I transcribed the interviews, I made note of my initial thoughts about the collected data, including "reflections, tentative themes, hunches, ideas, and things to pursue" (p. 161), and I took note of any changes or modifications to my approach that I wanted to make before the interviews began the following day.
- 4. After each day of data collection (interviews and observations), I repeated the same process of reflection described above and compared the sets of data. This comparison informed the next round of data collection, and so the cycle continued.

Once the first round of data was collected, I began the second phase of data analysis using open coding (Ezzy, 2002) and the constant comparison method (Strauss & Corbin, 1990), using HyperRESEARCH[™], a qualitative data analysis software package, to manage the data.

Bogden and Biklen (2003) suggest taking a long, hard look at the data, twice, and then making notes about categories and codes. Strauss and Corbin (1990) describe this first step as *conceptualizing*; during this step the data are broken down into codes that are "discrete incidents, ideas, events, and acts [that]...are then given a name that represents or stands for these" (p. 105). These discrete incidents can be paragraphs, sentences, or even a single word. The codes should convey the meaning or imagery of the incidents, ideas, events, and acts that they represent. This initial process of open coding is the first step in organizing the data and developing the analysis (Charmaz, 2002).

Constant comparison analysis was developed by Glaser and Strauss (1967) for use in grounded theory research but is commonly used by researchers who are not seeking to build theory (Merriam, 1998). Using constant comparison analysis, data is coded within each data set. Throughout the coding of that data set (for example, an interview), the researcher compares new segments of data to segments already coded. When new data is found with similar properties or common characteristics, it is assigned the same code. Next, themes and concepts are compared across data sets, resulting in a set of overall themes that characterize the phenomenon of interest (Merriam, 2002).

Initially I began with codes I had generated from the pilot study (Appendix A), and these codes were modified and refined as analysis proceeded. Using HyperRESEARCH[™] to code the data, I read the interviews and identified meaningful segments. These segments were phrases, sentences, paragraphs, or longer passages that exemplified a code or theme. Each meaningful segment was coded, with some segments having more than one code. For example, this excerpt from Patsy's interview was assigned the codes, "Pers-learning," "Facil-education," and "Env-lived experience:"

I learned about the baleen, which I didn't learn about in Alaska as much. I saw the bubble net feeding in Alaska, but I didn't know how the baleen actually felt, and I saw the layers of the like, fingernail stuff that everyone talked about but I didn't understand how I went together, and now that I saw it, one layer after another and the little fingers hanging out, so I understand it now, how it works.

See Appendix G for an example of coded data.

HyperRESEARCH[™] allows you to describe each code or theme. This makes it easier to distinguish between the nuances of each code when handling large amounts of data and a long list of codes. For example, I described the aforementioned codes the following way:

- 1. *Pers-learning*: Personal Context. Discussion of things that were learned on the trip, with no real attribution to others (facilitated) rather, by experience.
- 2. *Facil-education*: Sociocultural Context. Discussion of the learning objects with facilitated education (delivered to the passenger).
- 3. *Env-lived experience*: Physical Context. Value of lived experience and being there in the natural setting (might be juxtaposed with comparisons of TV, aquariums, etc.).

Each of these codes represents a different view of what I found to be important in this passage, and in fact, together these particular codes cut across all three contexts of interest in this study: personal, sociocultural, and physical. See Appendix H for a full list of codes and their descriptors.

Once the interviews were coded, I used HyperRESEARCH[™] to sort and categorize the passages according to the codes. This resulted in a list of passages from each interview, sorted by codes. For each group, I then looked for themes and categories within the codes. At times, this resulted in the combination of several codes, or alternatively, breaking one code into smaller and more discrete subsections of a code.

In the final stage of data analysis, I merged all five group cases into a single file to begin the process of analyzing the data across the cases. Again, I sorted according to code, and looked for themes and categories within and across the codes. Appendix I is an excerpt from this report. It contains the code, Env - value of lived experience and all of the source data from that code across the five group cases.

During the second, follow-up round of interviews (Phase 2), I transcribed each interview shortly after conducting it, and before the next interview. As with the first round of interviews, I followed a similar plan of preliminary analysis as I conducted each interview, and modified the interview protocol to incorporate questions that had been generated either during the interview or during the preliminary analysis. Once all of the follow-up interviews had been transcribed, I began the secondary phase of analysis on this round of data. I began with the coding scheme from Phase 1, modifying it as necessary, generating codes from the data, and using constant comparison to develop case analysis and cross-case analysis, as I did with the first round of interviews.

Reporting the Findings

Validity and Reliability

Validity speaks to the trustworthiness and credibility of the findings (Creswell, 2003), which is of major importance in any research study (Merriam, 2002). There were a number of ways that I attempted to address the issue of validity in this study. First, I used multiple methods of data sources, including interviews, artifacts, and participant observations in an attempt to triangulate the data (Bogdan & Biklen, 2003; Merriam, 1998; Patton, 2002). Second, I have made an effort to provide rich descriptions in order to help the reader get a sense of the experience (Creswell, 2003). Third, I have addressed my own personal biases and theoretical orientation in a following section.

While validity speaks to the degree to which the findings match what is really going on, reliability pertains to "others' concurring that given the data collected, the results make sense—they are consistent and dependable" (Merriam, 2002, p. 27). In quantitative research, this often refers to the instrument; in qualitative research, the researcher is the primary instrument of data

collection and analysis. Merriam (2002) suggests strategies that researchers can use to help ensure reliability. The two have already been discussed under validity: triangulation and clarifying bias. Another strategy is an audit trail, allowing independent readers to see how I came to my results by detailing how I collected data, how I coded and analyzed the data, and how I made decisions throughout the process.

Limitations of the Study

While I attempted to conduct this research with a wide cross-section of people, it is important to consider the existence of an inherent bias in terms of the type of people who tend to go on such excursions; whale watching trips are expensive (\$25-40 per trip) and require travel for most people.

Another limitation is that I was only immersed in the field for a short period of time (one week). During this time I went on six trips. Such a short time frame might limit the variability of experience that would be more apparent over the course of the season. For example, different whales might be more active during different times of season, and engaging in different behaviors. That being said, we did experience great variability in experiences from trip to trip, in both the weather and whale sightings.

This leads to the third consideration. Though not necessarily a limitation, it is important to realize that there is great variability with each whale watching trip, and each trip yields different reactions from the passengers, often mediated by expectations; how many whales are seen; at what distance they are seen; how calm, rough, windy, hot, or cold the weather is; and even how many trips the passengers had been on previously.

Researcher's Role and Theoretical Orientation

As the primary researcher for this project, I was immersed in the same environment and experience as my participants. I went with them on their trip, and I personally conducted all of the interviews and observations. Further, I was the one to analyze the data and draw conclusions from that data. As such, it is necessary for me to explain the theoretical lens through which I viewed this experience, and with which I analyzed the data.

I situate this research in sociocultural theory. Sociocultural theory is grounded in a paradigm that views knowledge as socially and culturally constructed, thus reality is not necessarily a truth, but a social invention. Originating in Vygotsky's work, sociocultural theory emphasizes the role of culture and society in development (Schauble et al., 1997). Through interactions within the culture, people learn. This learning takes shape in a number of ways, but it is mediated through cultural and psychological tools that help us to make sense of the world around us (Lemke, 2001; Robbins, 2002), and through spontaneous concepts, which arise from everyday life, from watching, participating, and interacting with others (John-Steiner & Mahn, 1996).

When applied to learning in informal environments, sociocultural theory can guide research and practice in a number of ways (Schauble et al., 1997). First, by recognizing the variability (and commonality) of the learner and their learning—from their prior experiences, knowledge, and interests, to the ways that they navigate through the experience. Second, by focusing on the process of learning rather than the product. Third, by recognizing that learning and change are developmental in both the short-term and the long-term (Schauble et al., 1997). In order to study and understand learning and meaning-making, we need to examine the interplay

between these factors and the role they have in the meaning-making process of individuals as they act in their social context.

Ethical Considerations

Qualitative interviews should be thought of as interventions (Patton, 2002). The interviewers are asking their participants to lay open their lives and share their thoughts, feelings, experiences, and impressions. Sometimes this process can have a profound impact on participants. As such, it is necessary for the qualitative researcher to take these risks into consideration and take precautions to protect the participants against unnecessary stress and discomfort. To this end, the research described in this study was reviewed and approved by the University of Georgia's Institutional Review Board (Appendix J). Further, Patton (2002) presents a checklist of ethical issues that researchers should consider when designing their research, and when collecting and analyzing data. Table 3.4 presents Patton's checklist of ethical issues in the context of this study.

Issue	How Addressed
Explaining purpose	When I approached potential participants, I
	began by introducing myself and
	explaining that I was interested in how
	people learn in informal environments.
	This was also briefly described on the
	participant consent form. I answered any
	other questions the participants had about
	the purpose of the study.
Promises and reciprocity: The researcher	I made it clear to participants that there
must make clear to the participants what	were no incentives offered for participating
they stand to gain from participating, and	in the study.
promises should not be made lightly.	
Risk assessment: Researchers must explain	There were no risks associated with
in what ways participation might put their	participating in this study. This was
participants at risk.	verbally explained, and was also stated in
	the consent form.

Table 3.4. Ethical Issues Addressed In This Study

Issue	How Addressed
Confidentiality: Confidentiality must be	The identity of the participants will not be
honored if promised.	known by anyone but the researcher.
	Participants are referred to by pseudonyms
	in all reports, and transcripts hold their
	pseudonyms only. I have stored the audio
	recordings on a disc in my locked home,
	and will destroy the disc five years after the
	study's completion.
Informed consent: Obtaining informed	The University of Georgia's Institutional
consent is a process, not just a form.	Review Board (IRB) approved this form
	(Appendix J). The informed consent form
	contained the title and purpose of the study,
	any benefits the participant stood to gain,
	procedures, potential stresses or
	discomforts, risks, matters of
	confidentiality, and contact information.
	All aspects of the form were explained
	verbally before the participant signed the
	form.

Table 3.4. Ethical Issues Addressed In This Study (continued)

Note. Adapted from "Qualitative research and evaluation methods" (3rd ed.), by M. Q. Patton, Thousand Oaks, CA: Sage.

Research Assumptions and Beliefs

All researchers bring with them certain assumptions and beliefs. Mine come from what I believe are three different areas: the methodology itself, a pilot study I conducted in the summer of 2005, and my own personal background.

Methodology. My own epistemology leads me to believe that knowledge is something that is constructed through our daily engagement in the world around us, and that truth is likewise a social construct. This epistemology influences the types of questions I tend to ask in my research, which then leads me to qualitative research methodologies.

Qualitative research seeks to study issues in depth and in detail (Patton, 2002). The questions I looked to answer with this research were essentially *how* questions. Questions such as these are well suited to studies using qualitative inquiry, which take place in natural settings,

actively involves participants, is emergent and interpretive, and views social phenomena holistically (Creswell, 2003).

There are certain biases inherent in qualitative research where the researcher serves as the primary instrument for data collection and analysis (Merriam, 2002). "Our personal histories, gender, social class, ethnicity, characteristics, beliefs, and biases influence every stage of the process. All of this has an impact on what we hear, observe, and deem as important" (Ruona, 2005, p. 235). With the researcher as instrument, all areas of data collection can be affected. Whether interviewing participants, choosing what artifacts to collect, or deciding who to watch and what to record in field notes, the bias of the researcher is bound to have an influence. Subjectivity statements and memos are used to make these biases as transparent as possible to both the reader and the researcher (Ruona, 2005).

Pilot study. The proposed study seeks to extend research that began summer 2005 with a pilot study in Gloucester, Massachusetts. I spoke with passengers on a whale watching boat (alone or in small groups) three times: once before the trip, once after the trip, and again six months later. My prior experience with interviewing the passengers, as well as the actual experience of being on a whale watching boat, has probably led to certain biases and expectations on my part based on these prior experiences. For example, I assume that the passengers will gain content knowledge from the experience, but this may not persist over time. I expect that a variety of factors will influence the informal learning experiences of adults in such settings, including: personal factors, such as background, prior experience, interest, motivation, knowledge; social factors, such as the interactions passengers had with their companions, strangers, educators, and staff; and the physical environment, such as comfort on the boat, amount of whale activity, and the weather.

Background and beliefs. As a child, I made frequent visits to the Smithsonian Museums in Washington, D.C. where I spent hours wandering through exhibits, revisiting my favorites year after year, and delighting in new discoveries. I cannot count how many times I gazed up at the giant elephant in the rotunda of the Natural History Museum; studied the dresses of the First Ladies and delighted in viewing Archie Bunker's chair in the American History Museum; or touched—with my very own hands!—a moon rock in the Air and Space Museum. These visits had a profound effect on me. Today, I take my own daughter to museums, parks, science centers, bookstores, and libraries. We see it as an opportunity to experience something new and novel, interesting and fun; the chance to get out together and *do*. As such, I feel that informal learning environments are valuable places for learning, and that the excitement and opportunities for exploration that they offer can lead to life-changing experiences.

Summary

In this chapter, I described the methods and methodology that guided this study. The research site was a whale watching boat north of Boston, Massachusetts. Participants were eleven passengers on the boat over the course of a one-week period in early July 2006. My primary method of data collection was interviews, supplemented by participant observations and document analysis. Data was collected in two phases. Phase 1 consisted of pre- and post-tour face-to-face group interviews. Phase 2 consisted of follow-up phone interviews with five of the participants six months after the initial set of interviews. Data was analyzed using the constant comparison method. To help ensure validity and reliability, I used a number of methods including triangulation; thick, rich description; clarifying my own biases; and leaving an audit trail.

CHAPTER FOUR: FINDINGS

Introduction

The purpose of this study was to explore the role of *personal, sociocultural, and physical contexts* on the short- and long-term experiences of adult participants in a natural, informal learning environment. In this chapter, I report the findings of this study as they emerged from an analysis of an individual survey and a series of interviews that took place (a) immediately before (pre-trip), (b) immediately following (post-trip), and (c) six-months after a whale watching trip. The first two interviews (immediately before and immediately following) were group interviews and will collectively be referred to as Phase 1. The five participant groups each contained two or three people. The long-term interviews that took place individually by phone with five of the participants approximately six months after the whale watch will be referred to as Phase 2.

The results are presented in three sections. In the first section, I present profiles of the individuals and the results of analysis of their group interviews. In the second section, I present the findings of the cross-case analysis from the Phase 1 interviews. In the final section, I present the findings from the Phase 2 interviews with five of the participants approximately six months after the trip. The cross-case findings in each section are framed by the personal, sociocultural, and physical contexts.

Participant Profiles and With-in Group Analysis

An embedded case approach was used to provide a more complete view of the participants and to demonstrate the unique qualities of each group. (Yin, 2002) I begin this section with profiles of each group, discussing themes that emerged from the Phase 1 interviews

(pre- and post-trip) within each case. These composites were generated from a variety of sources to create a picture of the participants, including participant information forms, interview transcripts, and field notes. It should be noted that while similar headings are used when applicable, there are often subheadings that are unique to only one or two of the cases, particularly with the post-trip interviews. Table 4.1 offers an overview of the participants in terms of prior experience, prior knowledge, and interest.

, ,	Prior Experience (# of trips)	Interest	Knowledge
Jay	1	Somewhat	Somewhat
Susan	2	Very	Somewhat
Sheryl	5	Very	Very
Patsy	7-day whale watching cruise	Very	Not very
Mary	1	Somewhat	Not very
Bryan	"many"	Somewhat	Somewhat
Caron	"a lot"	Somewhat	Somewhat
Rita	1	Very	Not very
Max	0	Very	Somewhat
Walt	100+	Very	Very
Kat	100+	Very	Very

Table 4.1 Overview of Prior Experience, Interest, and Knowledge By Participant

Mary, Sheryl, and Patsy

Mary, Sheryl, and Patsy were leading the line on the dock waiting to board the boat when I approached them about participating in the study. They agreed, contingent upon the condition that the interview would not keep them from boarding the boat first and securing their desired seats at the bow of the boat. They began to fill out the consent form and information sheet on the dock, and finished after boarding the boat. The preliminary interview took place on the bow of the boat as other passengers were loading. The post-trip interview took place in the galley after the boat had docked.

Mary was 36-45 years old, had a college education, and was a stay-at-home mother with four children ranging in age from 4-10 years old. She participated in one previous whale watching trip, and rated herself as somewhat interested in whales, but not very knowledgeable.

Sheryl was 46-55 years old and had an advanced college degree. She taught 6th grade, and described herself as the science specialist for her grade. She participated in five previous whale watching trips and rated herself as very interested and very knowledgeable about whales. Sheryl spoke up the most, tended to be the first to answer my questions, and often gave answers longer than those of her companions.

Patsy was 46-55 years old and a college graduate. She described her occupation as a "weekend house mother for retarded women" and rated herself as very interested, but not very knowledgeable about whales. Patsy told me that she is very interested in photography but is not very good. Earlier that summer Patsy went on a seven-day National Geographic photography expedition in Alaska and photographed whales.

Pre-trip Interview

Goals and expectations. When asked about their goals and expectations before the trip, all three participants spoke of what they hoped to see. Patsy talked exclusively about getting good photographs as her only goal for the trip; "I just want to take pictures. That's my thing." Mary, equally succinct, stated that she was just here "passing time. Killing time." She then qualified it by saying, "No really, of course I'm interested," but failed to elaborate.

Sheryl spoke more than the others about her expectations. She said she wanted to see whales and she hoped that Patsy would get a great photograph of a "breaching humpback right next to the boat...for our Christmas presents." Sheryl went on to talk about how she always learned something from the researchers on the boat, and expected this trip to be no different. She mentioned the company's alliance with a noted whale researcher, and then reiterated her desire to "see some whales."

Interest. Each of the participants had varying levels of interest in whales, often citing prior experiences as an influence on their current interest: Mary from a previous whale watching trip, Patsy from her photography expedition in Alaska, and Sheryl from the curriculum she used with her sixth-grade students.

Though Mary stated several times that she was just along to pass the time, she did say that she was interested. "I did this once and I thought it was neat, I thought it was fun, and I'd like to bring my kids sometime." Patsy again stated her interest was in taking photographs. In fact, in our interview before the trip, she talked about little other than taking photographs. Sheryl, in contrast, talked openly about how she became interested in whales and how she continued to pursue her interest in whales through a number of avenues:

I first got involved in them because at the school that I work at we show a program called the Voyage of the Mimi. And the very first year that we showed that the Mimi was here at Gloucester. And so I came here because of that the first time, and then after that I just drug people along because of that. So then I just started studying whales because I was teaching about it in my sixth grade classroom. Took a class at the College of the Atlantic, with Steve Katona who just happened to be one of the consultants on the Mimi so mine really started because of a program we use at school.

Post-trip Interview

Goals and expectations. After the trip concluded, all three agreed that the trip exceeded their expectations. As Sheryl explained:

I'd say it exceeded because I've never gotten to see the breaching up close before. I expected to see humpback whales and I expected to observe behaviors, I didn't expect to see that whole show while we were out there. And NOAA tagging a whale while we were out there, that was pretty cool, too.... So that was kind of fun to see the vessel out there and see that in action. So I would say it exceeded mine.

Patsy elaborated on her expectations based on reports of what passengers had seen on trips over the past few days:

The breaching was wonderful. I thought that was perfect....hearing the boat had seen things in days previous I didn't know [we would] see it again this very next day, so I was expecting to be disappointed.

Education. Mary, Patsy, and Sheryl talked extensively about the onboard education, in particular mentioning the interns and the visiting educators. As Mary shared:

I actually thought the staff was really good here, and very informative... and that was just great, and they made such an effort, and also all the people that were coming around and doing the education. That's a really nice part of the whole experience. So that was good. Sheryl elaborated further by explaining, "and they didn't wait for you to come to them. They came to you. They want you to learn something while you're out here."

They discussed that they were impressed with the environmental message of the organization. Mary offered:

I was impressed in the efforts to raise people's awareness about being sensitive to marine life and be responsible about that. ,,, I was impressed that they made the comment with regard to [the town] releasing the balloons, and that being less than ideal, I thought that was kind of like almost courageous 'cause that's a business here in town and to say that, I thought oh, well good for you. I was impressed by that, too.

The others agreed with Mary's sentiment, and wondered if the balloons we had seen on the water that day were from the balloon release to which Mary referred.

Another aspect of education mentioned by the group was the hands-on nature of the learning. When the educators came around, they usually carried some sort of artifact that the passengers could hold. This could be anything from actual baleen or a tooth from a whale, to maps of the ocean floor, rubber sand eels, or a CD player with whale songs.

Patsy described how seeing and holding a plate of baleen in her hands helped her to understand something she knew about, but had not fully understood until she held it in her hands, and then saw it in the open mouth of a feeding humpback. To further attest to the value of the lived experience when learning, Sheryl shared her thoughts about how she felt like she had not necessarily learned new information, but had a different understanding based on the experience:

Since I've been studying [whales] for a while and teaching kids and things, I wouldn't say I learned anything particularly new today except for one of the maps they had when they came around, it was a satellite photo with the impressions that show, you can see under the water because you can see how the waves change over the water, that was the first time I'd seen that. I mean I'd heard of them but I hadn't seen one of those passed around. I thought that was nice.

Mary explained that to her, seeing and hearing the ocean made it a multi-sensory experience, "and I think as a result you take more from it."

As the participants discussed their learning, they praised the educators, and explained how the artifacts and learning tools complemented the lived experience to help give them a more complete understanding of what they were seeing.

Behavioral changes. When asked if they would do anything differently as a result of the trip, each of the women had something to say. Patsy volunteered that Mary wanted to bring her children on a trip, and Mary added that her own children's "next project for school will be whales, not dolphins." Sheryl lamented that she would not be able to go on the special trip planned for the following week where the noted scientist with whom the boat was connected would act as the naturalist for a trip on a special dinner excursion.

Mary added that "as a result of this there is something very specific that I will not do. I will not release balloons in the air. I didn't really think about that before."

As mentioned earlier, Patsy stated repeatedly during the pre-trip interview that she was there to get photos. After the trip, she declared "the next time I go out, I'm not bringing the camera, because I really just want to see it." This change was dramatic because Patsy was pushing aside her previously-stated goals, and in fact her entire reason for coming (taking pictures), deciding instead to focus on the experience.

Overall impressions. Mary, Patsy, and Sheryl agreed that the trip was "excellent." Sheryl explained why:

I've been out several times and this is the first time I've been really close to breaching whales, so that was pretty exciting to me.... I did feel like our captain was being a little more selective about how close he got to the whales and what direction he approached

them from and things like that. So I would agree with you, it was an excellent day and we could have seen maybe more whales or more variety of whales but I was really happy because I saw some behaviors I've never seen before.

While they did mention the whales and the behaviors they saw, particularly talking about the breaching, what came up over and over again was the storm. Mary told me, "The weather enhanced the experience."

Sheryl agreed that it was a "marvelous part of the experience." At one point during the post-trip interview, Mary got a phone call from her husband checking on them because he had "been watching on radar the perfect storm off the coast of Gloucester. They said it was hurricane force winds." After the phone call, the women talked more about the experience and the intensity of the storm. By the end of the interview, they had progressed from calling it "hurricane force winds" to complementing the Captain and the boat for bringing "us through a hurricane." *Summary*

Mary, Sheryl, and Patsy indicated that they began the trip with varying levels of experience, interest, and knowledge about whales. For example, Sheryl described herself as very interested, while Mary proclaimed that she was "just killing time." Despite these contrasts, the women reported that the trip was excellent and exceeded their expectations, mainly due to the onboard education; their interactions with the educators; the hands-on learning tools that complemented the lived experience; and the excitement and adventure of the storm, the intensity of which seemed to grow in their descriptions as the interview progressed. They further indicated an increased awareness of whales and their ocean environment, which was expressed through a willingness to learn more, both by coming back and by focusing class lessons, and further manifested by deciding never again to release balloons into the air.

Max and Rita

I approached Max and Rita where they were sitting outside on the bow of the boat, on benches against the galley. They told me that they were there celebrating their second wedding anniversary. They lived in Massachusetts about 40 minutes away. Max was 26-35 years old and had recently finished a doctoral degree in chemical engineering. This was his first whale watching trip, and he rated himself as somewhat knowledgeable and very interested in whales.

Rita was also 26-35 years old, and a college graduate. She had been on one previous whale watching trip when she was twelve, though admitted that she remembered very little of it other than that it was a good time with her family. She rated herself as very interested, but not very knowledgeable about whales.

Pre-trip Interview

Goals and expectations. During the pre-trip interview, both Max and Rita gave very succinct answers to my questions. For example, when asked what their goals were, they both said they had none. In terms of expectations Max, having never been on a whale watching trip before, said that he did not know what to expect and just hoped to see some whales. Rita was more confidant that we would see whales since "they saw some yesterday," and she assured Max that it was "virtually guaranteed." At this point, neither participant demonstrated that they had anything else to share with me in terms of goals or expectations.

Post-trip Interview

Value of lived experience. Max and Rita both talked about the value of the lived experience versus other media outlets such as television documentaries or lectures. Max explained how he had heard about a certain whale behavior, but did not appreciate it until he actually saw it:

I've seen documentaries about marine animal behavior and they talk about the bubble nets, and how they'll trap fish like that and I've never seen that actually take place but that was really cool to watch them actually create the nets there and then scoop up all the fish or the eels.

Rita explained why this lived experience was more salient as a result of seeing it in person: It's one thing to see it on television or see photos, and even listen to other people. It's another thing when you see it in person and actually get to be there and be as close as you can, you know, sort of humanly get was really just neat to see them just being whales.

Education. In addition to learning through the lived experience, as described in the previous theme, Max and Rita both talked about how the naturalist's narration supplemented the lived experience to enhance their learning, as explained by Rita:

I found it just a lot easier to sort of focus my attention based on what [the naturalist] was saying, and just, instead of just watching them observing, she gave just enough sort of technical background to it that you felt somewhat more engaged in the whole process of watching. But it wasn't just watching, it was really sort of actively engaged in doing it, which was nice. I thought it was great. I think it would have been a very different

experience not to have had a naturalist sort of just sharing information.

When asked about their interactions with the interns and on-board educators, Max and Rita said that they saw them, but did not interact with them. Nor did they seek out information from other sources on the boat, such as those found in the galley area.

Social watching. While talking about the whale activity after the trip, I asked Max and Rita if they saw any behaviors that surprised them, to which Rita replied with a laugh, "Whale behavior or human behavior? Because I saw some shocking human behavior." I asked her to talk

to me about that, and she began to describe several different elements of human behavior that she had observed during the trip, beginning with a description of the private boats that were also out on the water that day who were, according to the captain and naturalist, behaving irresponsibly and in some cases illegally by approaching the whales and not cutting their engines:

Well the human behavior, it was just interesting to see how the whale watching vessels, you know how the company-owned vessels had a sort of much more respectful approach to it. Where it was really like, we're gonna sit and let them come to us, but the smaller individual people you know, when it's just a family out, it was very much like, oh, this is our ocean and we're gonna watch them.

She continued by talking about the behavior of other passengers on the boat, in particular one woman who she said was being loud and negative in her comments, shouting at the whales, "do it again, do it again," which Rita said was something that you might think in your head, but should not be "shouted out loud for an hour straight, it does get a little tiresome." Max did not comment on his view of these behaviors.

While they said that they saw the educators moving around the boat, talking with passengers and showing them different learning tools and artifacts, they said that they did not interact with any other passengers or staff during their trip, and were never approached by the interns.

Summary

Max and Rita discussed how the lived experience of seeing the whales in person helped them to better understand and appreciate the whales and their behaviors. Max relayed one example of a behavior he had learned about in a documentary, but that seeing it in person gave the experience new meaning. This was supplemented by the on-board education, specifically the

narration of the naturalist. While their discussion of the whale watch was positive, Rita expressed her frustration with others around her, including a passenger whom she felt was behaving rudely, as well as some of the pleasure boaters.

Jay and Susan

Jay and Susan were on the dock waiting to board the boat when I approached them. They both readily agreed to participate. The actual interview was conducted on the top deck of the boat, where they stayed for the duration of the trip.

Jay was 36-45 years old and had a high school education. He had been on one whale watching trip two years earlier with Susan. He described himself as somewhat interested, and somewhat knowledgeable about whales.

Susan, also high school educated, was between 26-35 years of age. She had been on two previous whale watching trips, and described herself as very interested, but only somewhat knowledgeable about whales.

They found seats on the port side of the upper deck and did not move from those spots for the duration of the trip. Even when whales were being spotted on the other side of the boat and all the other passengers were running from one side to the other, Jay and Susan stayed where they were with their cameras poised.

Pre-trip Interview

Goals and expectations. During the pre-trip interview, Susan and Jay gave very succinct answers to my interview questions. In fact, their answer to my questions about both goals and expectations was simply that they hoped to see some whales. Susan added that they hoped not to get seasick this time, as they had on their one previous whale watching trip, and they hoped "to
get some good pictures." This was the extent of what they shared with me in terms of goals and expectations before the trip.

Post-trip Intervew

Education. Although they did not share this with me during the pre-trip interview, both Susan and Jay agreed afterwards that their main reason for going out on the boat that day was education and that they expected to learn something. They shared with me their thoughts about how knowledgeable the educators were and how the learning tools enhanced their experience and understanding at a level that they would not have achieved had there been only narration with no hands-on learning tools.

Susan agreed that the education added to the experience, explaining, "if you didn't know something...they're very good at answering questions like, where the whales are, how big they are, what type of whales they are, so it's very helpful."

Value of lived experience. Jay and Susan discussed the value of the lived experience and seeing whales in their natural habitat, as compared to seeing other animals in a zoo. Jay explained:

You can go see pretty much any animal you want at a zoo or aquarium, but a whale, it's big, this beats a zoo I'd say...it's just more impressive, it really is. I mean, in a zoo, yeah, you have cool animals but they're all in cages, but out here, this is where they live. This is where it is. This is the only place you can really see them. I think that's a lot more impressive than anything.

They both agreed that they learned better in the natural setting, in part because of the hands-on nature of the education on the boat, which Susan said was more interesting because "you're actually seeing the whales and how it works."

Jay told me that as a result of the experience, "I think I'll have more of an interest, not only so much whales, but pretty much everything out in the ocean. Like I said, the whales are so interesting because you can see fish in an aquarium, but a whale, it's just fantastic. It really is."

Comparing to prior experience. When asked why they came out on the boat that afternoon, Susan explained that they had been on a trip two years earlier and enjoyed themselves so much that they wanted to do it again. Despite the fact that they both described the current trip as successful, several times they compared it unfavorably to that previous trip. They explained that on the previous trip, they "had more whale sightings." They shared a number of specific memories from that earlier trip. Jay remembered, "We saw whales right up on the side of the boat. You could look directly down and they were feeding right there next to the boat and saw, it was really up close."

Susan added, "We actually saw Salt and her calf," and further explained that the whales were so close to the boat that they "were actually bouncing the fish off the side of the boat," to which Jay added, "yep, they'd bring 'em right up to the boat and bounce them off and eat them. It was impressive."

Bringing knowledge from their prior experience to this trip, during our pre-trip interview Susan and Jay had explained how they both got seasick last time, and came prepared this time with Dramamine. After the trip that was one of the first things they said was good about the current trip – that they did not get seasick.

Jay and Susan also indicated that they brought memories from their last trip in terms of whale behaviors and what is likely to be seen on any particular trip. At one point, a minky whale breached rather close to the boat three or four times. Our naturalist explained that she had never seen a minky whale breach. Jay said that during their last trip, he remembered being told that

they do occasionally see whales breaching, but "it's few and far between. And here we saw one do it three or four times, that was pretty impressive. Right there I thought it was worth it." *Summary*

Jay and Susan began their trip with a shared, prior whale watching experience to which they compared the current trip. They discussed how the lived experience and on-board, hands-on education contributed to their appreciation of the experience, both in terms of helping them to understand the whales better, as well as being able to appreciate the experience as a whole. At several times throughout the interview, they shared with me some of the things they saw and learned from their previous trip that made that experience special. However, they agreed that the current trip was also successful, mainly due to the breaching minky whale.

Bryan and Caron

Bryan was a former captain of a whale watching boat, though he had not been on a trip in over fifteen years. He was a high school graduate over 66 years of age. He characterized himself as somewhat interested and somewhat knowledgeable about whales.

Caron was also over 66 years old and had a college degree. She too rated herself as somewhat interested and somewhat knowledgeable about whales.

In addition to Bryan's experience as a former whale watching captain, together they had seen whales many times on their own sailboats sometime "in the late 70's." They were on the boat this day as guests of the captain.

Several themes emerged from my interviews with Bryan and Caron, including their prior experiences with whales and whale watching, social interactions they had with others during the trip, and their overall impressions of the experience.

Pre-trip Interview

Goals and expectations. Bryan and Caron expressed limited goals and expectations for the trip. Caron said that she did not "have any expectations. I just hope that we see some, humpbacks especially. We think they're a lot of fun." Bryan added that they hoped to see them "perform," and that "when they breach is nice." Bryan agreed with Caron when she said, "we've been out there when we haven't seen a lot of anything so we're not really expecting anything."

Prior experience. Bryan and Caron both talked about their prior experiences with whales and whale watching, sometimes together in a recreational setting, and in Bryan's case, professionally. Caron described their first experience seeing whales:

The first time we ever saw a whale was in the late 70's, '78 I think. And there were no whale watch boats even in Gloucester then that I knew of. I don't think there were. And we were out in our 24-foot sailboat, just the two of us, and all of the sudden this thing came out of the water and, I mean, we were terrified. I was terrified, I don't know about him, but I was terrified because I had no idea there were even whales. I hadn't even heard that there were whales out here. Anyway that was the first whale we ever saw, and then later on we, we went out, we had an even bigger boat and we saw the whales a lot even when we were in our sailboat. I remember one day three of them were feeding right off the stern of our sailboat. You'd just look off the stern, with their mouths open, three of them, three or four of them, humpbacks, unbelievable. It was unbelievable. Cause they're so close when you're in a sailboat.

Bryan had further experience as a former whale watching boat captain. He explained that he used to fill in for other captains when they took leave or vacation time. They both told me that it had been probably fifteen years since they had seen whales.

Bryan and Caron told me that their prior experiences, both in their own boat as well as when captaining the whale watching boat, led them to have few expectations.

Post-trip Interview

Education. Bryan explained that because of his experience as an occasional captain of a whale watching boat, he was able to compare his prior trips with the current experience. For example, he told me that he was reminded of a lot of information that the naturalist and the educators shared, though admitted that a lot of it he had forgotten until he heard it again. He remarked that one thing that had changed was the addition of the hands-on educational materials, such as "the baleens and um, some of the other things they had on board, you know the little rubber sand eels, you get so people can see just what the bait looks like and all.

Social interacting. The impetus for this particular trip for Bryan and Caron was an invitation from the captain. They spent some time together in the pilot's house with the captain both before and after the whale watching, on the trip out and again on the way back in to the harbor. Bryan spent some time there also during the whale watching.

During the whale watch, Bryan spent time on both the lower and upper decks, while Caron remained on the upper deck for the duration of the trip. She told me that she did not really interact with any of the passengers, though I did witness her talking with some. She mentioned speaking with the educators and interns, but did not expand on the nature of her interactions with them.

Bryan shared more about his exchanges with others on the boat. In addition to saying that he had a "nice conversation" with the captain, he also talked about some of the educators he met onboard and his conversations with them. In particular, he told me about the experience of meeting a woman from Georgia and the conversation they had about that state. He said they were

together when the first whales were sighted and they enjoyed this together. Bryan told me that his interactions with other passengers and the educators were one of the "nice" things about his experience on the boat that day.

Overall impressions. Bryan and Caron agreed that it was a successful trip. Bryan explained that after not seeing whales for probably 15 years, it was "enjoyable and exciting to see them again." When asked if the trip met her expectations, Caron asserted:

Yes, it certainly did. It was a beautiful day, and a beautiful boat and the crew is great and the whales were great too. I thought, I know you never know what you're going to see as far as the whales, but um it definitely did. It was fine. It was great...I think it's a wonderful experience for people to go on.

During the interview, both Caron and Bryan talked about how beautiful the day was, and how they were just happy to have been out on the water and lucky enough to see some whales. *Summary*

Bryan and Caron had years of experience on the water and seeing whales, both recreationally and professionally. However, they had not been out on the water for fifteen years, and expressed excitement about the experience they had on the boat, both in terms of their perceived success of the whale watch, as well as the interactions they had with others on the boat. This included those familiar to them, such as the captain, as well as strangers, such as the interns, educators, and other passengers. Bryan was able to compare his experiences of fifteen-plus years ago as captain of a whale watching boat to their current experience and noted how the education had changed since then. They both expressed their satisfaction with the trip, and a willingness to return in the future.

Walt and Kat

Walt was a college-educated engineer who had been an avid photographer of whales for the previous three years. He rated himself as very interested and very knowledgeable about whales. He had been on over 150 trips in that time, often going out on two trips in a single day. He had a camera with a GPS attached that gave him a time and location stamp with each photograph.

Kat had been a naturalist onboard a whale watching boat in another coastal town for the past 15 years; the boat on which she worked had caught fire earlier in the season, and she told me she came out as a paying passenger because she missed seeing the whales, which she referred to as her "old friends." She was high school educated, and was trained by the naturalist onboard the boat of her first whale watching trip.

I approached Walt and Kat where they were seated in the galley before the beginning of the trip. They had boarded the boat earlier than the regular paying passengers. I later learned this was because of their special relationship with the naturalist and captain due to their frequent trips with Captain Nick's Whale Watch. Because they were going out on both the morning and afternoon trips, I followed up with them briefly after the first trip for general impressions, and conducted the full interview after the afternoon trip.

Pre-trip Interview

Goals and expectations. Before the first trip, Walt and Kat spoke at length about their previous whale watching experiences, and talking about what they hoped to see on this trip. Having had extensive experience, Walt explained that he tried to keep his expectations in check, acknowledging that each trip is different and if you go out expecting too much, you may get disappointed:

I learned long ago not to have a lot of expectations when the boat leaves the dock. I've gone out on trips when reports from even the morning trip, fantastic, fantastic, oh they're jumping out of the water, oh we had four of them corner the boat and kept it hostage for 35 minutes and were rubbing their backs on the hull, and all that stuff, and you get out [that afternoon] and find two that are snoozin'. Every trip is different so I go into it with no expectations.

Kat agreed, but then said, "I always go out with the anticipation that I'm going to see great stuff. And I might end up getting disappointed some days, but other days it's more than what I expected." To which Walt added:

You know, going out with high expectations you're kind of almost setting yourself up for disappointment so if you go out there figuring, and like the naturalist will say in her introductory speech, you're going to visit these creatures in their own habitat. It's like dropping in on somebody on a Saturday morning. Are they gonna be sleeping, they gonna be eating breakfast, they gonna be mowing the lawn, are they not going to be home at all? So it really doesn't, to have expectations doesn't do any good.

So while Kat agreed with Walt that is was important to keep expectations in check, she admitted that she had a difficult time doing so.

As to their goals for the day, Walt talked extensively about getting photographs and identification shots, which consists of matching tail fluke patterns to the names of known humpbacks. Kat had similar objectives, "you know I want to get some really nice fluke shots today and get them matched up.... My objective today is just to get some nice fluke shots, enjoy being out with my whales." She also expressed excitement about some recently spotted whales of personal interest to her:

There's been so many of them in the Northwest corner that haven't been here for a good four or five years, a lot of my old friends I've seen so far this season. My adopted whale has just been spotted this week so hopefully I'll get to see her today.

For the most part, Walt's goals were centered on getting good photographs, both for his own portfolio as well as for identifying new whales. He explained that he tried to keep his expectations low, but as I will describe in a following section, this did not necessarily mean that he did not feel disappointed. Kat, on the other hand, while interested in photographs and identifying whales, was more focused on the experience, of perhaps seeing some "old friends," and hoping to see some "great stuff."

Interest. Both participants talked enthusiastically about how they became interested in whales. Kat explained:

The very first time I ever went out on a whale watch I was hooked. And I just got into it from there. I was very lucky in that the boat that I went out on, the naturalist could feel my passion and she just took me under her wing and that was it. And I worked with her for over 10 years, and then went out on my own. So, it was really great, I mean it's worked out to be the best part of my whole life. It is my life.... This was close to 20 years ago now.

Compared to Kat, Walt was relatively new to whale watching. He told me how he became interested in whale watching in 2003, ten years after his only previous whale watching trip:

I hadn't been on the water in a bunch of years and I decided, time to get back on the water.... I remembered the company in Plymouth that I went out with 10 years ago so I did a little Internet search, found that they were still there, and that first trip in the modern era I saw a humpback and her calf, and they were both putting on quite a show. That was

all we saw all day, was the one humpback, but she was breaching and the calf was playing and I guess you might say that got me hooked. And I started coming out and I started seeing what they were doing and what, you know, what their lives were like, and now the more I see the more interested I get.... That started in 2003, in the fall. Late summer, early fall. So that year I think I packed in about 12 trips...last year I done about 35, and I'm on, it'll be about that this year. I don't really count trips, but if things are good, I'll go.

Both Walt and Kat agreed that whale watching was a regular and significant part of their lives. *Prior experience*. Walt and Kat went on to discuss previous trips and previous years. Kat

talked at length about 1998, and described it as "the best season we ever had:"

We'd see 50, 60, 70 animals per trip. Humpbacks. In one trip. You could almost walk across the ocean, we were always late getting back to the dock because we couldn't get out of the area. I mean, it was amazing. Feeding, breaching, everything, everywhere. It was awesome.... In '98 we would have 6, 7, 8, 9, 10 humpbacks all together. You know, they'd either be feeding together or they'd be traveling together.... You just get to know all these personalities and, it's just awesome. I can't wait.

Walt also shared details of a memorable trip:

We had a Good Friday trip in April that was absolutely incredible... we had three humpbacks feeding together, and we had a bunch of fin whales zipping around, but the humpbacks actually drove the finbacks off...at that point it was like, oh yeah, I think it's going to be a good year!

Post-trip Interview

Emotional impact. Although during the pre-trip interview Walt and Kat both described their expectations and goals as being somewhat similar (keep expectations low, hope for the best, good photographs and some ID shots), their evaluations of the trips afterwards were markedly different. Despite what Walt said in the pre-tour interview about keeping expectations in check, he expressed frustration and disappointment after both the morning and afternoon trips. When asked if the trip had any emotional effect on him, Walt expressed a range of emotions:

A little frustration for not getting the shots that I want to get.... Anger for some of these idiots out there in the pleasure boats that don't, obviously don't know what they're doing... Uh, a sense of calm and satisfaction, it's nice to be on the water. Sorry that today's weather didn't pan out as the forecast.

Kat expressed disappointment that she did not see "her whale," and expressed sadness over a calf we saw that had entanglement scars. Yet Kat also expressed awe and amazement at some of the behaviors she has seen over the years:

It's amazing to come out here and watch the mother teach her baby how to do the different things it needs to. We were out one day and you could see the mother trying to teach the baby how to blow bubbles. And the mother would blow, wait for the baby to do it, the mother would do it again and wait for the baby to do it. And after a while the baby finally blew some bubbles, the mother took her long pectoral flipper and caressed the baby's back. I get goosebumps standing up on my arms. It was so beautiful, it was just amazing. There is just so much out there that is so beautiful. And you have to go all the time or you don't see it. It's not something you see every day.

Future plans. As far as plans for the future, they both indicated their intentions to continue telling friends and family about their trips, "the different types of animals we see, what they, you know the activities they engage in, how beautiful they are." Further, they were already planning future trips by the end the day. Walt was planning a trip to Plymouth the following day, and Kat planned to go again the following week.

Overall impressions. Kat and Walt's overall impressions after each trip were quite different. Kat described the morning trip as "active," "great," and "awesome." She described the different activities we saw the whales engaged in that day, summarizing the trip for me in a way similar to what the on-board naturalist does for the passengers at the end of each trip.

In contrast, Walt responded by telling me it had turned out to be an "average" trip. He expressed his disappointment that we did not get closer to the whales, and that the lighting was poor for his photographs.

Kat's summary was more focused on the whales and their behaviors, whereas Walt's centered on his photography, and conditions that turned out not to be conducive to good photos. After the second trip, Kat again spoke up first:

My general impression is that the afternoon trip was totally different really than the first trip. We did have more feeding, we got to see Spoon and her calf. The calf was pretty banged up. We did get to see some awesome breaches by Trident's calf on the way back. We were getting ready to come back in. So we had two mother and calf pairs, which we didn't see this morning. Every trip is different. You know, you never, never know what you're going to find when you get out there, so you just, it was different. Totally different, but a good trip.

Walt again expressed frustration when asked about his overall impression from the afternoon trip:

As she said, different trip. Different experiences. There was frustration on my part because I missed the shot. I missed a lot of shots, and when you see one that is really spectacular like that with the whole whale out of the water and I look at the camera and all I got was a big splash and a little bit of tail.

Walt also discussed some of the logistical problems associated with taking photographs on a somewhat crowded boat:

Yeah, the number of people on the boat definitely impacts my ability to function, there are several shots I missed because I couldn't get from one side of the boat to the other because I had people just hanging in the doorway.

Summary

Both Walt and Kat had extensive experience whale watching, and both expressed a passion for the activity. They handled their expectations somewhat differently. While initially Kat agreed that it was wise to keep expectations in check, she followed that up by saying that she always expects to see something great. Both participants shared stories about how they became interested in whale watching, to the point of relating stories of how they got "hooked." Their reactions to the experience differed also; Kat was excited about the behaviors they saw that day, while Walt was more reserved owing to the fact that he felt like he chronically "missed the shot." By the end of the interview, both Kat and Walt were planning their next trip out, sometime within the next week.

Short-term Perceptions and Learning: Cross-case Analysis

In this section, I present this study's cross-case findings as they relate to the personal, sociocultural, and physical contexts, and relate how these contexts influence participants' short-term perceptions of the nature of their experience, and short-term perceptions of learning.

Personal Context

The personal context includes: motivations and expectations; prior knowledge, interests, and beliefs; and choice and control (Dierking, 2002). The personal context considers the preexisting characteristics that learners bring to the experience as a major factor in what they get out of it. Of course, this is different for each individual involved, and implies that the experience and learning outcomes will be unique for each individual.

In deciding how to categorize the participants in terms of the personal context, I considered three different possible groupings: experience, prior knowledge, and interest. Experience level was based on how many prior trips they had taken, along with how recently their last trips were. In terms of knowledge and interest, I let the participants rate their own levels of each, with their choices being: *not very, somewhat*, and *very knowledgeable*; and *not very, somewhat*, and *very interested*.

Experience Level		
Inexperienced	Moderate	Veterans
Jay	Caron	Walt
Susan	Bryan	Kat
Mary	Patsy	
Rita	Sheryl	
Max		

Table 4.2. Personal Context in Terms of Experience, Knowledge, and Interest

Knowledge Level				
Not Very	Somewhat	Very		
Mary	Caron	Kat		
Patsy	Bryan	Walt		
Rita	Max	Sheryl		
	Jay			
	Susan			
Interest Level				
Not Very	Somewhat	Very		
	Mary	Kat		
	Caron	Walt		
	Bryan	Sheryl		
	Jay	Patsy		
		Max		
		Rita		
		Susan		

 Table 4.2. Personal Context in Terms of Experience, Knowledge, and Interest (continued)

 Knowledge Level

As seen in Table 4.2, knowledge and interest levels seemed to have very little relationship. For example, two participants with moderate experience, Sheryl and Patsy, were at opposite ends of the spectrum when rating their knowledge levels (Sheryl rating herself as very knowledgeable, Patsy as not very knowledgeable), but similar again with their interest levels (very interested). Some participants rated themselves as very interested but not very knowledgeable (for example, Rita and Patsy). In all cases, interest level was equal to or exceeded knowledge level. There were no cases where participants rated their knowledge level higher than their interest level, and no participants who rated themselves as *not very interested*.

It is worthy to note that when rating their own levels of knowledge, participants may have been holding themselves up to different standards, which could account for their perceived different levels of knowledge. There were no pre-tests given to the participants, so this aspect of the study relied solely on self-reporting.

After looking for but finding no relationships between experience level, interest, and knowledge, I looked for trends using each of those factors as the frame. What I found was that

prior experience seemed to be the central factor in defining participants' reasons for going on the trip, goals, reactions, future plans, and learning outcomes. Table 4.3 summarizes these factors.

Experience Level	Inexperienced (1-2 prior trips)	Moderate (fair amount of prior experience in recent past, or extensive experience in distant past [15 years	Veterans (very experienced, with 100+ trips within the past 5 years)
Participants	Jay	prior]) Caron	Walt
	Mary Rita Max	Patsy Sheryl	Kat
Goals	 Take pictures See whales Kill time Enjoy myself (ourselves) 	 Take pictures See specific behaviors Have fun 	 Take pictures ID shots See specific whales
Post-trip Reactions	 Fun, enjoyable, exciting Compared to previous trips 	 Fun, enjoyable, exciting Compared to previous trips 	 Compared to previous trips Compared to goals for the trip Summarized trip
Future Plans	 Whale project for own children Tell friends Take another trip 	 Continue to teach students about whales Share pictures Tell friends Take another trip 	Tell friendsTake more trips

 Table 4.3. Participants' Personal Context Themes, Grouped By Experience Level

Prior Experience

I have categorized the participants in this study into three groups according to experience level: inexperienced, moderately experienced, and veterans. For the inexperienced group, consisting of Jay, Susan, Mary, Rita, and Max, this was only their first or second whale watching

experience.

The moderately experienced group, made up of Bryan, Caron, Patsy, and Sheryl, are more diverse in their experiences. Bryan used to fill in occasionally as a whale watching boat captain, and his wife Caron sometimes went on the boat with him. Further, they used to see whales while out on their own sailboats. I classified them as moderately experienced for several reasons. First, they had not been out on the water at all in over fifteen years. Second, they told me how many aspects of the trip were different than when they used to go. For example, the hands-on education was new to them. Third, they told me that though they had probably heard much of the information shared by the naturalist at one time, they had forgotten most of it.

Prior to that summer, Patsy had only been on one whale watching trip, however she had recently returned from a seven-day National Geographic whale watching photography expedition in Alaska. Often during our interviews she referred to that experience and compared it to this one.

Sheryl had been on five previous trips and had been teaching a unit on whales to her sixth grade students for many years. She had taken all of her previous trips with this particular whale watch company. She was familiar with their conservation and research efforts, and knew the main areas in the marine sanctuary by name.

Kat and Walt make up the veterans group. They had each been on well over 100 whale watching trips. Kat had been whale watching for twenty years, and had been a naturalist on board a whale watching boat for fifteen years. At the beginning of the season, the boat where she worked had caught fire and was out of commission for the season. She was on-board as a paying customer so she could continue to go on whale watches.

Walt started going on whale watches in 2003. Since then, he had taken an average of 30-40 trips a year, often taking two trips in a single day and going several days in a row. Both Kat

and Walt frequently went out on the boat where I was conducting my research, but occasionally would go out on other boats out of other towns.

Reasons for Coming

Despite experience level, the participants' reasons for coming were fairly similar: most conveyed the hope "to have fun." The idea of doing "something fun...something new" was expressed by several of the passengers. Jay and Susan shared that they "went on a trip two years ago and had a really great time, so we thought we'd do it again." Sheryl said that "whale watching here is better than anywhere else...so if we're gonna whale watch, we need to come to Gloucester."

For Kat and Walt it was more personal. Kat referred to the whales as "my old friends," had specific whales she hoped to see, and overall planned to "enjoy being out with my whales." Walt, who also referred to them as "my whales," added, "seeing humpbacks is what I like to do. They're always showing us something different, different aspects of their lives, and it blends in with my interest in photography and like Kat, I supply research data to a variety of different organizations. ID shots, locations, and general reports of what's going on."

Goals

Goals were varied, often according to the amount of experience that each participant had with whale watches. The more experienced whale watchers tended to have more specific goals than those with less experience. Most of the participants, regardless of experience level, expressed that they had few expectations other than seeing whales, and several (particularly the veterans) cautioned against having high expectations. Goals across experience levels included getting good pictures, seeing whales, and generally enjoying themselves out on the water that day.

Pictures. Members of each experience-level mentioned pictures as a goal, though the participants with less experience were less detailed with their goals regarding pictures. For example, Susan and Jay, who had only one prior whale watching experience, simply said that they hoped to "get some good pictures." Max and Rita shared similar hopes.

Those with a moderate amount of experience had more specific goals for their pictures. Sheryl and Patsy both mentioned hoping to get photos of certain behaviors, and even talked about their hopes for getting "a really good picture for our Christmas presents." Likewise, Bryan hoped to get some pictures for a friend in Key West who "always talks about seeing the whales. I'd like to be able to show him some pictures."

Contrast this to Walt and Kat, each of whom had been on well over one hundred whale watches. Walt, who brought with him an album of some of his photographs from previous trips, described what he hoped to get out of the day, which for him consisted of both the morning and afternoon trips:

Get the best photographs I could possibly get, you know, get that ID shot that maybe the naturalist up at the front of the boat misses, or just to be able to lend a hand with a couple of ID's. Last week we had a whale that I recognized instantly and the naturalist hadn't seen yet, but on the afternoon trip having seen it before and having had an ID with it she could now identify it. And there are a bunch of them, what 1700 of them out there that have been ID'ed and I've probably only seen 150 of them so they are always a bunch of new ones and it's fun after the fact to sit down during the week and get some names put with the photographs so I can add it to my own little database.

Likewise, Kat had specific photography goals for the trip, "you know I want to get some really nice fluke shots today and get them matched up." She then went on to describe how the pictures help her get to know some of the newer whales, since she is more familiar with the older ones.

"See some whales." Another sentiment I heard often in terms of goals was the desire to see some whales. While this may seem obvious on a whale watching trip, the specificity with which this idea was conveyed varied according to experience. Those inexperienced with whale watches tended to characterize their hopes in rather simplistic terms, such as *"We just hope to see some whales,"* and *"have a good time. See some whales."*

Sheryl, who had a moderate amount of experience with whale watches, was more specific in terms of her goals for seeing certain behaviors, expressing her hope "for a breaching humpback right next to the boat," as she had never seen this particular behavior before.

The more experienced whale watchers had even more specific goals. Kat was hoping to see a few whales in particular that day, one that she had adopted several years earlier, and another that she had not seen since 1998 but had been spotted in the area the day before. Walt and Kat both mentioned hoping to get some identification shots that they could share with some of the tracking agencies, such as the Center for Coastal Studies.

"Enjoy ourselves." Most of the participants expressed a desire and expectation to enjoy themselves on the boat that day. Indeed, before the trip most of the participants shared with me the sentiment that they were "just happy to be here." Walt went so far as to say, "it's a beautiful day, and a bad day whale watching is better than a good day at work or doing just about anything else. Love being out on the water." In fact, at least one member from each group shared Walt's idea that just being out on the water was itself a pleasant experience; that "I'm going to enjoy the trip, enjoy the day, and whatever happens, happens and I'll make the most of it."

Post-trip Reactions

There were participants from all experience levels who described the day as generically fun, enjoyable, and exciting. Kat told me that for her, "every time I see whales it's just like the first time." Max's comments were typical: "I thought it was a good experience. It was fun. I enjoyed being out here, never seen whales up close before, so it was really great to see them in their natural habitat."

It was not unusual for participants who had been on prior trips to compare the current trip to their previous experiences. Some had only one prior trip to compare it with (Jay, Susan, Mary, Rita), and others (like Walt and Kat) had hundreds. The first thing Jay and Susan said to me after the trip was, "I enjoyed it, but I think the first one we went on had more whale sightings." Jay went on to describe some of the behaviors they had seen on that first trip, and concluded with, "Don't get me wrong, this was really nice, but that first trip we had was a little bit better."

Rather than compare, when asked for her reaction Kat gave me a summary after each trip, including the whales we saw and their behaviors. After the morning trip, her first of two trips that day, she related:

I thought the trip was really an awesome trip, it kind of gave us an idea of the different types of activities that we can see the whales in. We saw some feeding, which stopped. We saw the first group of three animals that came up together, they were feeding, and then you saw them just separate. You saw them just take off in three different directions, which is pretty awesome. And then you saw kind of the routine of the flipper slapping going into the breaching, and then everything kind of just settled down, and then we'd find another group of animals doing something different. It was really a very active morning trip. It was great. Awesome.

The naturalist on-board our whale watching boat did a similar overview at the conclusion of each trip, and so it was not surprising to me that Kat, also a naturalist, would also share her reactions in the form of a summary.

Walt, also highly experienced, expressed his disappointment and frustration with several aspects of both of his trips that day. After what many passengers considered a remarkable day of whale watching, with multiple breaches, flipper and tail slapping, bubble nets, mother-calf pairs, lunge-feeding, fin whales and over forty humpback whales, Walt described the morning trip like this:

I guess it was pretty much what's turning out to be an average morning trip for this year. Not a lot of feeding activity, but uh, some breaching, some flipper slapping. From the photo point of view I'm always disappointed we can't get closer or we can't get something in good light, everything always seemed to be way off in the distance in the haze, but eventually that will come in time.

After the afternoon trip, Walt reiterated his "frustration for not getting the shots that I want to get." He also expressed anger, as did the other participants on the boat that day (Max, Rita, and Kat), about the pleasure boaters who were violating laws that protect whales and regulate the actions of boaters when around whales.

Kat related her sadness after seeing a calf with a damaged dorsal fin, probably due to a boat accident or net entanglement, "that poor little calf has to start his life the way it did, really banged up, that poor little baby."

Future Plans

Participants in each experience group expressed interest in going on another trip at some time. There seemed to be no difference in how the inexperienced and moderately experienced

group expressed this idea; there was interest, but no definite plans as to when this would take place. Mary, Rita, and Max all conveyed the desire to come back again with their children. Mary said she'd like to bring her four children, perhaps the following year. For Max and Rita, it was the idea of bringing the family that they had not yet started; "it's something to do again. Something we'd bring our kids to one day." Sheryl lamented that she could not come back the following week for a special trip with a noted whale researcher, but said she would definitely be back out again. The experienced whale watchers, Kat and Walt, differed in that they were both already planning their next trip, with Walt intending to take a trip the following day from another coastal town, and Kat expecting to go the following week.

Summary

The specificity of reasons for coming and goals for the trip seemed to be related to the amount of experience the participants had with whale watches. Those for whom this was their first or second trip expressed just a hope to have some fun, see some whales, and get some pictures. Those with a moderate amount of experience had more specific goals, such as seeing certain behaviors they had not seen before, or getting certain kinds of photographs in order to share with others. The more experienced whale watchers not only had certain behaviors, but certain whales that they hoped to see and photograph, including some they knew by name, as well as a generic hope to see whales that had not yet been recorded and identified this season so they could contribute this information to tracking agencies. Despite these variations of goals based on experience, all groups shared the idea that just being out on the water was a pleasant experience, no matter what they ended up seeing that day.

Reactions to the trip were generalized across the experience levels in many cases. Most expressed a degree of contentment, but some seemed more compelled to compare the experience

to previous trips. This was the case whether they had one prior trip, such as Jay and Susan, or hundreds of prior trips, such as Walt. Kat shared stories from previous trips, as did Caron and Bryan at various times during the interview. One participant, Walt, expressed frustration as his main reaction; this was mainly focused on dissatisfaction with his photographs.

Members of each group expressed a desire and intent to go whale watching again at some point. For members of the inexperienced and moderately experienced group, this was a vague intent, sometimes with the plan to bring other family members with them. For the veterans, they were planning their next trip within the week, with exact dates and locations in mind.

Sociocultural Context

The sociocultural context includes *within-group mediation*, as well as *facilitated mediation by others* (Dierking, 2002). Within-group mediation can include conversations, exchanges, and interactions between the members of any group, such as that which happens between parents and children, and also within peer groups. On the whale watching boat, these interactions would be between companions, as well as other passengers. Facilitated mediation by others focuses on learner interactions with educators, docents, guides, etc. These interactions are usually informal in nature and take place with someone who is perceived to be more knowledgeable about the particular field of interest. On the whale watching boat, the naturalist, interns, and educators were the facilitators. The results in this section were analyzed from the post-trip interviews.

With-in Group Mediation

This category focuses on the interactions and contact between other people on the boat, both companions and strangers. I identified two main categories of with-in group mediation: social interactions and social watching. However, these characterizations often overlapped and

are therefore difficult and impractical to discuss separately.

Very few of the participants told me that they had conversations with other passengers. Bryan and Caron spent some time in the wheelhouse talking with the captain, with whom they had been acquainted for many years. Bryan told me that he had also spent some time:

Talking to a lady down on the lower deck for quite a while and she was from Georgia and we talked a lot about the state of Georgia where we had stopped on our way home from Key West and she was real nice. And also we were talking about the whales, it was at the time when we were getting real close to them and both of us were really enjoying it. And

uh, I talked to a couple of other nice people that I met from the state of Georgia. Caron told me that she "didn't really get to talk to any passengers" though I had witnessed her speaking to one for a short while.

Jay and Susan, as well as Max and Rita, said they had kept to themselves for most of the trip. Walt went so far as to say that he would "do very well on a boat with very few people. Like the crew, myself, and a few hand-selected people." Others who were disturbed by the actions of other passengers echoed Walt's frustration. Rita told me that she had seen some "shocking" behaviors. She went on to mention an incident that had bothered her:

Listening to some people on the boat, there were a couple people who were just really sort of, you know obnoxious about it and sort of created an atmosphere that was really disruptful, the sort of peaceful serenity of being out and watching whales, but to have some people standing next to you being really negative and being really, really obnoxious started to really to bother a lot of people in the area. And you could see people just sort of migrate away from those, because everybody just seemed to want to enjoy the whales in their habitat and just not invade the space at all.

Rita, Walt, and Kat all mentioned their frustration with the pleasure boaters who were out on the water that day, who seemed either unaware or unconcerned about the laws regarding whales. Kat said, "Some of these small boaters are really stupid. Watching that guy back up, he doesn't know whether that calf might have been coming up behind him. You never back up in your boat. That's stupid. Really stupid." Walt said it made him angry that these "idiots" are:

More wrapped up in their own selfishness at having the experience they want to have, and yet when things get hot and heavy too close to the boat they're the first ones to panic and try to get away, not realizing that they're putting their, you know putting these animals lives in danger for their own purpose.

In a similar vein, Sheryl talked about our whale watching boat as compared to another whale watching boat that was also in the area that day, "I did feel like our captain was being a little more selective about how close he got to the whales and what direction he approached them from and things like that."

The observation of other people on the boat was not always negative. Several participants shared stories of how they enjoyed watching other passengers on the trip. Sheryl told me, "I really kinda had fun watching what the other people were doing. You know, the kids enjoying something, or the parent missing it because they're making sure the kids aren't falling overboard," To which Mary added, "Or making sure the baby is going to make it back to the cabin in gale force winds."

In terms of spotting whales, other passengers often aided in that endeavor by pointing out whales that have just been sighted, particularly those off in the distance. Sheryl added, "You get very attuned to anybody pointing a finger."

Facilitated Mediation

Facilitated mediation focuses on the interactions between educators and passengers. This is another category difficult to break down; the two main components are education, and social interactions between passengers and the educators, however the two activities are so intertwined that to break it apart would be to separate it from the context.

Several passengers mentioned how helpful the naturalist's narration of the trip over the intercom was. Rita explained how the naturalist's narration helped her to focus her attention and feel more engaged and active than if she had just been watching the whales with no additional information.

Jay also mentioned the naturalist, but said that it was the educators and interns that really helped make the experience more meaningful to him:

What you see going on out there is impressive, but when [the educators] come by and they actually tell you why [the whales] are doing it, and you know they actually have those samples they brought over and show you everything, you know what it's like, it pretty much explains it all. If you would just come out here and nobody was coming around with any examples or teaching or anything you'd think, oh that's cool, that's impressive, but you really don't understand it.

Mary agreed that the educators were "really good here, and very informative, and that was just great, and they made such an effort, and also all the people that were coming around and doing the education. That's a nice part of the experience." This idea was reiterated by all of the inexperienced and moderately experienced passengers that I spoke with, with the exception of Rita and Max. Unlike most of the other participants, they admitted that they did not interact with the educators at all. "I saw people up front who had the baleen and the other, they were talking

mostly with the kids," he explained, "they seemed to be enjoying it, but we didn't go up and speak with them at all."

This sentiment contradicts Sheryl's view of the educators when she said, "they didn't wait for you to come to them. They came to you. They want you to learn something while you're out here. Unless of course you don't want to learn." In fact, it was rare that I encountered any passengers who were not at least approached by the educators at some point during the trip, though not every passenger chose to talk with them.

Because Walt and Kat were such regulars on the whale watching boat, the educators knew that they were each experienced enough that they did not need to see the material again. Rather, I saw some of the educators, particularly the interns, approach Walt and Kat with questions. On the way back to the harbor, the naturalist came down to the galley where Walt and Kat were seated and talked with them for a while. Their interactions resembled those of colleagues rather than educator/learner.

For some, interactions with the educators were limited, for the most part, to education. For others, such as Mary, Pasty, and Sheryl, their conversations were also social in nature. Mary and Sheryl talked to me about some of the educators they met:

Mary: There's a woman who works ... with the crew, but she had spoke with such passion about living here and what she did, and what she wanted to do with her life. Sheryl: She's fifteen, she's been a volunteer out here since she was ten. She's going to school to replace the naturalist on this boat, and she just lit up talking about it. Mary: It was, it was great. And I think when you see someone talk like that, you feel it. And there was a woman with your group who had returned to school after her children were raised and is graduating. Her name was Molly, she was just, what great enthusiasm

she had, you know. And there were some other people I didn't realize they were all educators. It was terrific.

This group talked about their social interactions, both with-in and facilitated, at length. For the other groups, social interactions with the educators were not a part of the experience that they shared with me.

Summary

Interactions between the passengers were limited. For the most part, the participants stayed within their own social groups and did not venture out other than "small talk." This is not to say that the actions of others did not have an effect on the participants' experience. Several mentioned how the actions of others impeded on their enjoyment by being "loud," "obnoxious," or just in the way. Others noted that it was fun watching others, particularly children.

Interactions with the educators took several forms. For some, there were no interactions at all other than overhearing exchanges with other passengers. For others, it was limited to educational discussions. For at least one group, the discussion went from educational to social. All participants however expressed an appreciation for the education on-board, either through the interns or through the narration of the naturalist.

Physical Context

In order to learn, it is important to feel comfortable in your surroundings (Falk & Dierking, 2000). This can include physical comfort, such as temperature, or in the case of a whale watching boat, the feeling of safety and stability. The design of the physical environment, such as the on-board education, can also affect visitors' experiences and learning, though not always in the way the designers intended. On a whale watching boat, the whales themselves

become a part of the physical environment and, like the weather, are unpredictable and out of the control of the visitors.

When asked about the boat itself and whether the boat had any influence on their experience, participants had very little to say. Most had spent little to no time exploring the boat. Max and Rita stayed on the bow of the boat for the length of the trip, moving around on the bow in order to see the whales, but never leaving that general area. Likewise, Jay and Susan stayed on the top deck for the length of the trip and rarely moved from the bench on which they were sitting. Walt and Kat stayed in the galley until whales were spotted, and went right back to that spot for the ride back to the harbor. Sheryl, Patsy, and Mary, afraid to go inside and get seasick, stayed outside the entire time, even during severe rain and wind. Caron and Bryan were the only ones who commented on the boat. Bryan explained:

I'm always interested in boats cause I used to run them, and I had a captain's license for many years. This boat was, it seems excellent for doing this. It's fast, it's quiet, and it handles the sea really well. I know, even when it's rough.

Caron added, "it doesn't leave a wake." To which Bryan agreed, "that's right. It doesn't leave a big wake."

The aspects that inspired the most conversation among participants in terms of the physical context was the value of the lived experience and the weather, including the consequences that resulted from the weather.

Value of Lived Experience

One idea brought up repeatedly was the value of being there in person, and how that experience enhanced participants' understanding of whales and whale behaviors. Max told me that seeing the whales make bubble nets to trap fish was something he had seen in documentaries

but had never seen in real life before. He added, "that was really interesting to see firsthand after hearing about it and I've read about it, so that was pretty neat to see how they actually do it." For Max, the trip reinforced a concept that he was familiar with, but had never seen in person. Patsy shared an experience that had a similar effect on her understanding:

I didn't know how the baleen actually felt, and I saw the layers of the like, fingernail stuff that everyone talked about but I didn't understand how it went together, and now that I saw it, one layer after another and the little fingers hanging out, so I understand it now, how it works.

For Patsy, hearing about the baleen was not enough. It was holding the baleen in her hands, and then seeing it in whales' open mouths that helped her finally understand it.

While these examples show how the lived experience helped participants understand specific concepts that they were familiar with, others expressed a more general appreciation of seeing the whales in their natural environment, such as when Jay said that you can see many animals in the zoo, but whales you can only see in their natural environment.

Mary explained why she felt that being there in person was more enriching than learning about whales in a more sterile environment:

It's a multi-sensory thing, like all your senses are involved. Cause everybody would say, oooh! And you'd see it, and you're feeling the ocean, and it's just, I think everything is involved, and I think you learn more. You know, people are always talking about, oh, are you a visual learner, or what kind of learner are you? Well this was complete.

Participants repeatedly expressed the idea that being there and seeing the whales in person in their natural habitat was one of the defining aspects of their experience, so different than "watching it sort of passively on a television."

The Weather

Several participants, including Jay, Susan, Mary, Sheryl, and Patsy mentioned seasickness as a worry, and hoped that the waves would not be rough. Each of them had taken some precautions against seasickness, either in pill or patch form, and members of the aforementioned groups had experienced seasickness before. These groups brought this concern up several times, but all were satisfied with the effectiveness of their respective preventive measures.

The weather conditions were mentioned several times by members in all groups, and were sometimes interpreted differently even by participants on the same trip. For example, Walt, Kat, Matt, and Rita were all out on the same afternoon trip. Matt and Rita described it as a "nice day. I think if the weather had been bad it could have been different but I think, it's just a good day to be out on the water." My own notes from the trip describe it as a "warm, windy day with mild waves." Walt, while admitting that it was "nice to be on the water," also added that he was "sorry that today's weather didn't pan out as the forecast. It was supposed to be a bright sunny day, and you've got just about nothing but clouds, but that's the nature of what this is." Walt explained that his disappointment with the weather centered on the fact that the lighting was not optimal for photography, which was his primary goal for the trip. Max and Rita, who were not as concerned with getting photographs, were happy with the weather.

Contrast this day to the weather that Sheryl, Patsy, and Mary had on the day of their trip. The trip started with windy weather, and the waves were choppy and rough with large swells that made it extremely difficult to move around the boat without holding on, particularly when the boat was broadside to the waves. When the wall of a considerable storm approached and the rain started, everyone was asked to go inside the cabin. On the way back to the harbor, the captain

had to go twenty-five minutes out of his way to skirt the storm, and sat at the mouth of the harbor for another thirty minutes due to bad visibility and dangerous conditions. We later found out that a tornado had touched down in a neighboring town.

Sheryl, Patsy, and Mary, determined to stay outside for the entire trip, choose to find shelter at the stern of the boat under a small overhang next to the heads rather than going inside the galley area. Mary recounted their excitement:

You felt the power of the ocean more. So it made it that much more awesome, you know?

The rain on the water and the colors of the ocean and the streaks and striations were just,

I've never seen that before. And the water droplets hitting the water were just beautiful. The idea that the storm enhanced the experience was echoed by Sheryl, who said, "it was a great ending to the whole thing ... we just thought it was a marvelous part of the experience."

Summary

For the participants of this study, the physical aspects most often mentioned centered on the value of the lived experience and the weather.

All groups talked about the value of the lived experience and how personally seeing the whales was "more impressive" than reading about them or watching a program about whales on television. Several mentioned how the on-board education enhanced the experience by helping them understand concepts that they had heard or read about but perhaps did not have a complete understanding of. Further, the whales themselves demonstrated behaviors that some were familiar with but had not seen in person.

No single weather pattern was identified as optimal. For some, a warm, sunny day was desired. Others were simply happy that it was not raining during their trip. For another group, a

strong storm with hurricane-force winds was the event that made the trip more exciting. Only Walt, for whom taking pictures was a primary goal, expressed disappointment with the weather.

Long-term Perceptions and Learning: Five Cases

Phase 2 interviews were conducted individually by phone with five of the participants approximately six months after the whale watching trip. Each of the eleven original participants was solicited for follow-up. Two of these participants, Mary and Patsy, asked me to send them the questions via email, to which I complied. However, despite numerous follow-up emails and unanswered phone calls, neither Mary nor Patsy ever returned the questionnaire. Jay, Susan, Bryan, and Kat did not respond to my emails or phone calls. In the end, the following five participants responded to my invitation: Rita, Max, Caron, Sheryl, and Walt. These five represent members from each of the experience levels presented in the short-term findings, with Max and Rita falling in the inexperienced group, Caron and Sheryl in the moderately experienced group, and Walt as the veteran whale watcher of the group.

The results from Phase 2 interviews are presented in three main categories: personal context, sociocultural context and physical context. As with Phase 1, the results of Phase 2 interviews are presented individually, followed by a cross-case analysis.

Rita

During the follow-up interview, Rita shared a vivid recollection of a series of whale behaviors and related those to her personal interests. She also recounted several social situations she had witnessed and described how those incidents effected her trip. Finally, she talked about how the weather and the lived experience effected her enjoyment of the trip.

Personal Context

Rita worked in a preschool with toddlers. During the follow-up interview, she remembered witnessing a series of whale behaviors that she had associated with behaviors she saw in the children at her work:

I keep toddlers for a living and the baby whale was being such a toddler, and it was kind of left behind and it was trying to find it's mother and it thought it, it found like an adult whale and it thought it was it's mother and then it was kind of like "oh no!" It had this realization that there were just, you know like pulling somebody else's pants in the grocery story, and it was like, "wait, you're a big lady but you're not my mother." And then it was trying to find it's mom and it kept searching and it finally caught up but it was such a 2-year-old mentality and I thought it was amazing because I [see] that all day long, and I mean all day long.

When asked why she thought that memory was so strong six months later, she told me, "I think I just really enjoy my job and I tend to sort of become attracted to that kind of behavior." She added, "I'm looking at it through my eyes and my own lifetime and my own thoughts and so there are things that are going to be more important to me...that maybe wasn't important to other people."

Several times Rita ascribed human thoughts and characteristics to the whales. As described above, she related a scenario that she saw with a mother and calf to what she sees in her preschool children. Later, she talked about how they saw "a lot of swimming around and a lot of, curiosity I guess? I don't know whether it was actually curiosity on their part but that's how it came off." Rita said that she did not feel like she learned anything from the trip, but was reminded of "that feeling of connectedness to other things in the universe. I mean, it's not necessarily something that I forget at all, but it's always nice to be reminded of it in a really personal way." Rita admitted that she did not think that she had changed her behaviors in any way since the trip, mainly because "I don't participate in polluting the ocean to begin with" and admitted to paying little attention to the news in general.

Sociocultural Context

Similar to our Phase 1, Rita related stories about two incidents that happened with other whale watchers that had effected her enjoyment of the experience, with a comparable amount of details. The first incident had to do with "somebody's personal, private boat:"

It was really close to the whales and they hadn't stopped their engine and that was a little nerve-wracking for people on the boat including myself and my husband, we're like, you know you're really close to a live animal you know, it was just sort of that, unfortunately pretty normal human behavior of like, we're more important than them, I can do what we want. And that person just like wouldn't cut the engine.

The second story had to do with a fellow passenger on the whale watching boat. Rita spoke at length about this "one really, really irritating woman:"

She had this sort of, 'I know everything about whales' attitude, when in reality she didn't know anything more than I do, and I don't know anything about whales and I'm okay with saying that, I'm not a whale expert and that's okay, but she had remembered a few key phrases, you know, basic terminology that she was just saying over and over and it was non-stop and everyone around her was getting really irritated but she was so, just absorbed in what she was doing that she had no idea that everyone else around her was,
people were moving away from her, people were giving her dirty looks, basically everyone was doing everything but going up to her and just telling her to be quiet.

When I asked her if that had an impact on her enjoyment of the trip, she said it did not, because she knew it was more important to have a good time with her husband, particularly because she said he tends to be unaffected by such people. Even so, this was something she remembered six months later in detail.

Physical Context

Rita's recollections in terms of the physical context were limited and focused on two main areas: the weather and the value of the lived experience. Rita recalled the weather being "a perfect day...with just the right amount of clouds in the sky," adding that if the weather had been bad or they had not seen as many whales, she would have been disappointed with the day.

Rita also talked about how the experience was multi-sensory, "being right there and seeing it with your own eyes, feeling the ocean, feeling the breeze, being on the boat." She compared actively participating in the experience with "passive media, " explaining, "I mean I've seen plenty of wonderful shows you know on Discovery channel about whales but as beautiful as they are it's not the same as being right there."

Summary

Rita shared some memories from her trip that related specifically to her work life as a preschool teacher, comparing the behavior of a whale calf to that of typical toddlers and ascribing human characteristics to the whales. She told me that she did not feel that she had learned anything other than being reminded of a feeling of connectedness to the universe.

The stories that Rita shared concerning other people tended to involve her annoyance with them. She shared two stories, one regarding pleasure boaters, and one regarding another

passenger. She told me that she did not let them effect her enjoyment during the trip, mainly because she did not want to cause friction between she and her husband.

Rita had few comments regarding the physical context. She expressed her approval of the weather that day, and that she enjoyed the multi-sensory aspect of the lived experience.

Max

During the Phase 2 interview, Max shared some recollections but failed to elaborate on most of his memories with more than a sentence or two despite prompts on my part to encourage him to do so. He and Rita were there for a "fun day," and though they had few interactions with other passengers or the educators, he said he was impressed with the naturalist and her knowledge. He shared information he received on the trip with a few other people afterwards, and talked about the value of hands-on experiences.

Personal Context

Max told me that his purpose for going was to celebrate his first wedding anniversary with Rita and was "just pretty much recreational." Max explained that because he had never been on a whale watching trip before, he would have been happy "seeing anything" and that he had gone on the trip with no goals or expectations other than to have a "nice day on the water." He said that what he remembered most was a whale breaching, "a young whale actually fully out of the water. That was impressive."

Sociocultural Context

Max seemed unaffected by the "annoying" passenger that so bothered his wife, Rita. Max never mentioned the passenger in any of the interviews and said that they had not interacted with others on the boat aside from the "occasional comment or people pointing out things to each other." Max said that the whale watching trip was something he and Rita were looking forward

to doing together, and since it was a day out for just the two of them, they probably would have had a good day together whether or not they went whale watching.

In terms of the facilitated education, Max appreciated the naturalist and the information she gave, saying that without her, "it still would have been fun but I clearly wouldn't have learned as much." He marveled at the her ability to not only identify each whale based on physical characteristics, but also to know "their personalities and family dynamics."

Several times during the interview Max mentioned the little information cards that the educators onboard handed out to passengers after the trip. These cards were designed for a wallet or purse as a fish buying reference in grocery stores or restaurants, assessing such characteristics as sustainable fishing practices and mercury levels. Max mentioned this card several times and told me how he had shown it to others, even though he admitted that he did not eat fish himself. *Physical Context*

Max communicated to me his ideas about the value of the lived experience in an authentic environment as opposed to more removed learning opportunities:

I've always found hands-on, on-location learning has been a much better way than sitting in a classroom or stumbling upon something in a store cause it's just, you're more cognizant of the surroundings and what's actually going on. More in context. I think it's using more senses than just watching or seeing it on TV. It's more immersive actually being there, seeing everything. Feeling it and being outside on the boat is a lot different than sitting on the sofa reading a book or watching it on TV.

Max connected the "on-location" learning to why he remembered so much of the trip.

Summary

Despite numerous prompts, Max tended to answer questions quite succinctly and with little elaboration. He expressed that he and Rita had gone on the whale watch with no goals or expectations other than to have a good time and spend time together. Max told me that he appreciated the naturalist and the information she provided, but they had not interacted with any of the educators or other passengers. Finally, Max said that hands-on, situated learning was a better way for him to learn, even though he had not actually interacted with the educators when they brought around the hands-on learning tools.

Caron

Although it had been ten to fifteen years since Caron had been on a whale watch, her memories of them from the past led her to have certain expectations going in. She admitted to talking with few people on the boat other than the captain and a few of the educators, and had vague memories of the physical environment that day.

Personal Context

Caron and her husband, Bryan, were friends and guests of John, the captain of the boat. Their expectations going into the trip were based on their prior experiences as well as their conversations with the captain. Caron told me, "I knew how you usually will see a few other boats out there, and also I know how you go from one place to another, so I knew that was going to happen. Mmm." They also had expectations based on what the captain had told them:

He had been telling us there had been a lot of them around that season and you know so I also knew from past experience that you never know what the whales are going to do, you can't expect to see breaches or anything like that, but we did see quite a bit that day.

Caron shared only a few specific memories from the trip, which included a breaching whale toward the end of the trip. Instead, she tended to talk more about trips she had made in the distant past and her first experience seeing whales:

We hadn't been sailing a while...and had been out there and it was before any whale watching and we never even thought about whales, and I saw that thing and I had no idea, and when I realized it was a whale, I mean I was scared really cause our boat wasn't that big and I had no idea what it was going to do, and it was just like I'd never heard about whales being out there, it was really amazing.

Caron recalled another time when they were on a private boat and again encountered whales: I might have told you this one, we were on another friend's bigger sailboat and we were coming in in a thunderstorm at dark, it was dark, and um, you could hear whales all around the boat...but you couldn't see them but you could hear them. It's kind of wild. For Caron, my questions about the whale watching trip elicited stories of trips from a decade earlier more often than it did stories from the previous summer.

Sociocultural Context

At first Caron said she did not talk to other people while on the boat, but later said, "I did talk to a few of the people who were visiting and hadn't been out before." She also mentioned talking to John, the captain, and how that was "good." When asked if those interactions affected her experience, she said, "it made it definitely more enjoyable I mean I think, you know? Talking to the people that were studying them, they have a lot of knowledge you know? I mean, I think that really adds to it, you know?" Finally, she mentioned telling friends later about the trip in general, and specifically about talking with me.

Physical Context

Caron's memories of the trip were often intertwined with previous trips, despite the fact that it had been ten to fifteen years since they had been out on the water. When asked about the weather that day, her recollection was vague, saying, "I can't remember exactly, I think it was maybe not real bright and sunny, but not overcast. Maybe I have it mixed up with another day, although that was the only day I went out." Likewise, when asked about what she remembered from the trip, she started with a specific memory, but lapsed into a generalization:

I remember seeing a whale kind of breach toward the end of when we were out there, and you know, mostly just hearing them, I always like that, hearing them blowing. And when before they dive, you know, you kind of can tell when they're going to make the dive and see the fluke there, you know?

Summary

During our Phase 2 interview, Caron spent more time talking about experiences with whales in the distant past than she did about the trip from six months earlier, and was unable to recall many details from the trip. She told me that she had spent some time in the wheelhouse talking with the captain, but had little to say about interactions with others on the trip other than that it made the trip more enjoyable. When asked for specific details, she often lapsed into generalizations about whales and whale watching trips, rather than specifics about the particular trip.

Sheryl

Sheryl brought her experiences from previous whale watches with her to help form her expectations for the trip six months earlier. She shared memories of her interactions with her

companions, the educators, and other passengers on the boat, as well as vivid memories of the storm.

Personal Context

Sheryl went into the trip with five previous whale watching experiences with the same company. These experiences led her to have a number of expectations that she was able to articulate even six months after the trip:

I was expecting we would see some humpbacks because I know they're hanging around out there, I know the boats, the drivers all talk to each other so they know where to go, and generally which ones they'll see on any given day so I expected that we'd actually see some whales. I actually thought that we'd see a greater variety than we did, cause usually there's a fin somewhere along the way, we didn't even see dolphins or porpoises out that day, which we usually have some of them around, too. But you know I actually expected to have them tell us about the whales because I'd been on the ship before, did not expect the horrible weather. I expected it to get cold when we went out of the harbor and we had all of our right stuff together because I knew what it was going to be like, but I certainly didn't expect the storm on the way back.

Sheryl went on to describe in what ways she thought the trip was typical, sharing that the amount of time it took to find the first whale, the time we took to follow whales, "flipper flapping," and flukes were all typical activities that you see on a whale watching trip. She also described the ways in which this particular trip was atypical, including seeing multiple breaches so close to the boat and the "hurricane."

Sheryl credited her prior experiences to why she had these expectations, and further discussed how she still learned something from each trip:

I remember there were one or two new facts that I heard and they stood out at the time because it wasn't something that I'd heard before, but I can't remember now what they

were. So I may have already shared it with my students as if it's old knowledge for me. Sheryl incorporated the new information with what she already knew. By the time we spoke six months later, she was unable to separate the two.

Sociocultural Context

Sheryl spoke at length of her interactions with others, including her companions, Mary and Patsy, the other passengers, as well as the educators and interns. Since it was Mary's first whale watching trip, Sheryl often described Mary's reactions to the experience as well as talking about her own:

And here's the funniest part of the story when Mary tells it. So we get back and we're telling our friends about ... and she's saying, she felt so stupid because Patsy and I are ... both talking about this whale we're both seeing and we just keep going, "there it goes! And again. And again." And the whole time we're doing this we're still so far away that she doesn't see it, she doesn't see the splash, she doesn't know what we're talking about, she doesn't see anything on the horizon, but she doesn't want to look stupid so she doesn't say anything like, "where are you guys looking?" And we did that about ten times before she finally, actually saw the whale and realized we weren't just making this up and we weren't just trying to torture her. And then she was so excited.

When talking about her own expectations, Sheryl added, "and of course Mary had never seen any of those things and was really curious about all of them so that was exciting because you know she didn't know what it was and wanted to know what we were seeing."

Likewise, Sheryl talked about Patsy's quest to photograph a breaching whale, and how they worked together to try to make that happen:

We were following one or two of them around that were breaching on a timed sequence, because Patsy had a really nice camera but you know you can't get ready to take the picture and be watching to take the picture and I was actually counting down and saying 3-2-1 and then the whale would come out of the water.

Sheryl mentioned not only her companions, but also others on the boat. When trying to recall during our interview a new fact that she had learned but could not remember specifically, what she did remember was talking about it with someone:

This always happens that there is something that you didn't hear them say before and that you heard this time around, but I don't remember what it was. Something to do with the baleen because I remember talking to somebody, I remember questioning but I don't remember what it was.

Sheryl summed up her interactions with others passengers heretofore unknown to her as such: It just made it more pleasant, there was uh, when we were up front there was a lady with a really small kid, a one or two-year-old it seemed like, and we had brought all this stuff with us, you know a picnic lunch on board cause we thought we might want to eat lunch while we were out there, and you know we were feeding the kid crackers because she was whining and as long as we were feeding her she was fine. And so those were the people we were talking to on the front of the boat, and the people on the back of the boat in the storm you know I think we may have sung the Gilligan's Island theme song with them and it just makes it more pleasant if there are nice people on the boat.

Sheryl also recalled talking with the onboard educators. Sheryl admitted that she always chose and recommended this particular company because "I feel like they're actually researchers on board and they always tell you the latest things and some facts you didn't know and I use those things with my students so any knowledge about humpback whales." She remembered one intern in particular that they talked to during the trip and talked about afterwards:

One of them was a kid who was 15 or 16 but she'd been working on the boat for a couple years, or maybe she was even younger than that, I forget, but I remember we talked about how enthusiastic she was and how, she having done this for a few years how excited she was just about being out and seeing the whales.

Sheryl and her companions even interacted with the captain at one point during the storm: On the way back in we had a horrible storm if you remember, and we all get seasick and we didn't want to go inside the cabin and we were outside and Mary was facing us and behind us in the distance a whale breached and she saw it first, and she goes, 'I am not kidding you. There is a whale breaching behind us.' And she points, and we turned around and we saw it too and the captain got on his megaphone and goes, 'I think you girls are just making things up out there.' And we kept pointing and finally he saw it too.

Physical Context

When asked what she remembered most from the trip, Sheryl said, "That would be the breaching whales and the hurricane that we came back in." Sheryl mentioned the breaching whales several times during our conversation and how she counted so Patsy could time her pictures, and how long it took Mary to finally see the breaching whale.

Many of Sheryl's stories about the experience centered on the storm, which they thought was "big fun." Sheryl recalled:

Well we finally moved out of the front because it was really raining hard but we still didn't want to go inside that cabin because by then I think somebody had thrown up and that wouldn't have done us any good. So no, we just stayed at the back of the boat the whole time and there were a couple of other people out there, too, and we just had a great time.

When asked how that effected her impression of the trip, she said:

We didn't mind that at all. I think that a few people might have been a little perturbed about it but we just thought it was big fun calling the group and saying, 'whoa, we got caught in a hurricane and couldn't come to land.' I believe we actually tried to call them from the boat, I think we might have actually gotten through from out in the harbor cause Mary's husband was kind of like, 'you what?'

Summary

Sheryl was able to describe a number of expectations she had going in to the trip based on her prior experiences, and compared those expectations with her actual experience on the boat. While six months later she remembered that she had learned a few new facts, she could not remember exactly what those facts were.

Sheryl was able to recall a great deal about her interactions with other people while on the boat, including those with her companions, other passengers, and the educators. She recalled details about her interactions with each of these groups, and also talked about stories she and her companions shared with other friends after the trip.

What Sheryl said she remembered most from the trip were the breaching whales and the severe weather. Sheryl recognized that both of those experiences were unusual and thought that these experiences helped make the trip "fun."

Walt

Walt admitted to sharing a deep, spiritual connection to whales during the Phase 2 interview. He talked about his interactions with the whales more than about his interactions with others on the boat. His reporting of the physical environment was restricted to clinical observations from his journal.

Personal Context

During the Phase 2 interview, Walt often shared stories about trips other than the ones we were on together six months earlier. Though he was able to recall events of the specific day we met after consulting his notes, he had been on 48 trips that season so it was unrealistic to ask him to constrain his reflections to that one specific day. Walt told me that his most salient memory from our trip together was the calf breaching:

The vision of that calf completely free and clear of the water. Completely out of his element, and yet that little tail was still pumping. It was like he didn't even know he was completely out of the water. It was like he was still trying to go. Maybe some youthful exuberance on the part of the calf ... but yet there's this sense of play, but there's also the sense of, that infant type of things where you don't fully know what your environment is, you're just still learning.

Walt said that the reason that memory was so vivid was because, though he had seen whales breach hundreds of times over the years, he had never seen a whale completely clear the water before, and "to see that calf and to see that tail flapping away like crazy was, I don't know, even thinking about it now it just kind of makes me chuckle."

Walt considered his relationship with the whales to be extremely personal. As he explained:

My spirituality is based in, I guess the closest thing I can say is it's based in Native American traditions, so animals and the earth are very important. American Indians hold different animals as totems. Humpbacks, I don't know why, but there is a connection I have with humpback whales.

Walt talked with me at great length about the spiritual connection he had with whales, which was something he had not mentioned during my Phase 1 interviews with he and Kat.

Sociocultural Context

Walt tended to describe his interactions with the whales more than his interactions with humans, who he felt "just get in the way." He did mention several instances where other boaters were behaving dangerously around the whales, and how he reported them to the U.S. Fish and Wildlife Service. The majority of Walt's interactions with humans while onboard the boat that day was with Kat before and after the whale watch, where they sat together in the galley area. He also talked with a few of the interns as they came over to look at his pictures, and after the trip he chatted briefly with Vivian, the naturalist.

During our interview, Walt mentioned times from other trips when he was on the observation deck with the naturalist, which is normally restricted from the passengers. He told me about how his approach is different than that of the naturalists':

I have to temper my opinion of the naturalist a lot of times because in my mind...they're dealing purely with science and what's known to science. It's also very easy to assign human emotions and behaviors if you get into an area that you're not comfortable with or don't know. I know Vivian quite well ... I know a lot of different naturalists, and I don't want to take anything away from any of them because they're all very good at what they

do. They're all very good [but] they have to stay within the constraints of what is known to science.

Walt said that he himself did not feel so constrained, and was "free to offer my own interpretations or come to my own conclusions based on information that is available to me that is not available to them," adding, "I've come up with a bunch of things that science can't prove, and probably would never be able to prove, yet do you say that I'm more wrong?"

Walt told me that he communicated directly with the whales. For the other participants, the whales were part of the physical environment. For Walt, they were part of the sociocultural context. He shared many stories with me that exemplified this relationship; perhaps the most dramatic was when he first discovered their importance in his life:

I'm heading for Plymouth and I'm not even, I'm probably five to seven miles from the dock and I just start hearing whale song in my head. ... I'm just listening and I'm sitting there going, 'well, okay, I can't understand it but right now I don't care. I'm just going to enjoy the song.' And got on the boat and headed out.... Shortly thereafter I ran across a whale named Coral. And it was like... I'd just met my brother, and I don't have a brother. And I'm just, it's just blowing me away. On the way home that afternoon, same thing in the car, whale song.... Couple days later I was at one of my spiritual mentor's places and ... and all of the sudden there is a whale in my head and he wants to talk. And out it came, I channeled, I was channeling Coral, and I've done that off and on ever since. I've dialogued, not only do I channel but I dialog with them.

Walt went on to explain that he felt like his purpose in life was to translate for the whales and to be an "interpreter," explaining:

A humpback is not something that gets the human emotions going like a fuzzy bunny.... If you're trying to get some protection for a humpback, you know the average person isn't going to give an "oh" and an "ah" over something that is 45 tons bigger than them, you know a lot of people think they're ugly because they don't look like us, because they don't have hair, or fur, and they're not cute, they're not cuddly, you can't pick them up, how do you get somebody, how do you endear a humpback to somebody? And I guess that's part of my mission.

Walt explained that there were times when the whales communicated with him about what they were doing and why in order to help him or someone he was with better understand the whale's behaviors. One time, for example, he was on the upper bow lookout with the naturalist on "one of those trips where [the whales] were either snoozin' or crusin'." He said the naturalist turned to him and wondered why they slept in pairs. Walt responded:

Without even a conscious thought, which makes me believe it came from a different source, it just came out of my mouth...I wasn't even thinking about it, it was just rolling off my tongue, 'well it's pretty simple, the water here is pretty busy with boats and they sleep in pairs because, as you know they only rest one side of their brains at a time so when they're sitting there in a pair, each one's half a brain that's facing the other one is resting. The outward brains are alert and awake and listening for ships or any problems.' And I said, 'you know, they'll, after a while they'll switch positions so that it allows them to rest the other side.'

Walt credited the whales for giving him that information.

Physical Context

Walt took notes during and after each trip to document the physical environment. When consulting his notes from the trip we took together, he reported:

John was driving, Vivian was the Nat, uh we had light winds and calm seas in the morning and the afternoon, water was 60, air was 65-70. We were mid-bank on the west side. Uh, we had Dyad, Ivory, and a whole wad more, about 40 total, we had 10 minkies and 3 finners in the morning, uh PM trip, we stopped at the northwest corner, that's 6 humpbacks feeding, Spoon and Trident and their calves. Walrus, Trident's calf did a full breach completely clear of the water. Okay, I remember that trip now. I have that vision etched in my mind and I missed the damn picture.

Walt explained that his notes were restricted to describing the physical and environmental conditions rather than serving as a journal where he recorded his feelings or reactions. However, reading his notes about the physical environment made him remember his disappointment in missing the picture of Walrus in a full breach.

Summary

Walt expressed a deep spiritual connection with humpback whales. He had been on hundreds of previous whale watching trips, and was able to recall specific details from the trip six months earlier with the help of his journal to stimulate recall.

Walt said that most of his interactions on any whale watching trip were with the whales themselves and not with other passengers, who he felt got in his way. At times he interacted with the naturalist. For the most part, his social interactions were limited to conversations with his companion, Kat, before and after the whale watch.

The physical context played only a small part of his recollections. He used his journal to remind himself of the conditions that day, but otherwise commented very little on other aspects of the physical environment.

Long-term Perceptions and Learning: Cross Case Analysis In this section, I looked across the cases to find themes that relate to long-term perceptions and learning in each of the three contexts: personal, sociocultural, and physical. However, there was such diversity in these participants that it was difficult to find strong themes that went across all the cases. In this section I present trends identified in the data from more than one participant. These trends may help inform our knowledge of long-term perceptions and learning.

Personal Context

Long-term recall with regards to the personal context was focused on how personal attributes contributed to follow-up behaviors, the nature of memories and recollections, and learning.

Personal context and follow-up behaviors

Personal attitudes about whales and reasons for going on the whale watch varied and were reflected in the participants' responses during the Phase 2 interviews. For Rita, Max, and Caron, the whale watching trip was a recreational excursion, a pleasurable way to spend an afternoon with family and friends out on the water. For these participants, the experience was a rather isolated event. They had little expectations going in, and had little follow-up after the trip other than to tell some family and friends about the experience. They all indicated the idea that they would possibly go on another whale watch sometime in the future. They all expressed that the trip was enjoyable, but they had made no changes in their lives because of it. Sheryl and Walt, on the other hand, both had long-term interests in whales, albeit on quite different levels and for different reasons. For Sheryl, it was directly related to a unit she taught on whales to her sixth graders each year. When asked if she had thought about the trip afterwards, Sheryl said:

I do get reminded about it frequently because of [Patsy's photos] and we just finished the first semester doing the Voyage of the Mimi [at school] and I always pull out all my whale stuff then, including all the pictures we took this summer. And so anything I do

like that in my classroom, and we're already talking about [another trip next summer]. Walt characterized his "obsession" with whale watching as a spiritual connection and part of his "life's purpose.... If the weather is good and I'm not working, I'm going." During the offseason, he has incorporated whales into his life through his photography Web site and spiritual avenues.

Nature of memories and recollections

There were qualitative differences in the nature of the participants' memories, and these seemed to dovetail with their interests and prior experiences. When participants tied the whale behaviors they saw on the whale watch that day to their personal life, they tended to describe those whale behaviors in more detail. The series of trips represented by these participants was unusual in that every participant saw at least one breaching whale, and some saw multiple breaches. This was the first thing mentioned in terms of memories of whale behaviors for every participant with whom I spoke.

Rita had a vivid recollection of the whale calf that had breached several times during the trip. Rita related to this story because she works in a preschool and said that the whale was

"being such a toddler," comparing the calf's behavior with those of the children she sees everyday.

Walt, who was on that same trip, also talked about Walrus breaching. After reviewing his notes to remind himself of which trip we were on together, he said, "Okay, I remember that trip now. I have that vision etched in my mind and I missed the damn picture." Other than the specific memory of Walrus completely out of the water, "that little tail...still pumping," his recollections were likely to be from any trip he had taken that year, or even in past years. Additionally, instead of reporting solely on whale behaviors he remembered, he tended to describe a behavior or incident, and then relate this to his spirituality and his belief in direct communication with the whales, at times implying that a whale had done a certain action specifically to give him information. For instance, he told me about a time when he was in front of the wheelhouse with the naturalist when a whale "fluked up," and went back under. There was debate between Walt and the naturalist regarding what whale they had just seen. Walt said it was Division but the naturalist disagreed:

On cue, you couldn't have orchestrated it any better, up comes Division, right beside the boat, with the sun showing the dorsal fin, the light patch, and she almost came up backwards, kind of came up dorsal fin first, which is really weird because they don't surface like that...at that point almost went vertical in the water, flipped the fluke up, twisted it a little bit so the underside pointed right where we were standing at the front of the bridge, held it there for about 15 seconds, and slowly sank in the water. Now you tell me that's not deliberate. And then the naturalist turns to me and says, 'you were right. It was Division.' And you know, I didn't thank her, I thanked Division.

Walt's memory of this incident was quite vivid, and he used this story to demonstrate how he and the whales communicated with each other.

Caron's initial recollections were more social in nature, particularly when asked what she remembered most. She did mention seeing a whale breach, but that was the extent of her specific memories related to the whales, except for saying, "we saw quite a lot of [whales] that day."

Sheryl listed a series of memories that stuck out for her:

Well let's see, the hurricane because they said we can't go in port right now and uh, we had been kidding about the Gilligan's island and off on a three-hour tour and then we are not being able to go back on the island so, it's always, something always happens and it makes a good story. The breaching whales because I hadn't seen it up close and personal before and then they had, the people from your class, and the ones going around teaching little things and telling little things.

The participant's memories, and the vividness of those memories, seem related to their personal interests, prior experience, and backgrounds going into the experience. Some of the memories were quite vivid and descriptive, while others tended to be rather vague. Those participants who linked the whale behaviors that they saw on the whale watch to their own personal experiences and interests tended to describe those behaviors in more detail.

Learning

It is difficult to determine the amount of learning that took place while on the boat, or the learning that might have continued after leaving the boat. There were vague recollections of the "facts" by some, or even thoughts that they had probably learned something, but could not remember what. For example, many times during our interview Caron had a difficult time remembering specific details. When asked if she felt she had learned anything, she said, "I

probably did but I can't think right now." She added, "I probably did even talking to some of you people and I know, I remember, but I can't remember."

Max told me that he learned "about the laws protecting the marine sanctuary there, how different people interact with wildlife out there." He added that he learned from the "little cards they gave out of what seafood was safe to eat, even though I don't eat seafood."

Sheryl admitted to learning "one or two new facts" but could not remember what those facts were, and speculated that she had probably already incorporated it into her "old knowledge." Rita said that she hadn't necessarily learned, but was reminded of the "connectedness...to other things in the universe."

Walt told me, "I'm learning something every day, if not from them then from other beings." He did not articulate anything specific he learned that day, but implied in many of his stories that he learned from the whales through his communications with them.

Sociocultural Context

Long-term factors in the Sociocultural Context centered on interactions with educators while on the boat, and talking with people about the trip, including companions as well as friends, family, and co-workers after the trip.

Telling Others

All of the participants indicated that they told friends, family, and/or co-workers about their experience on the whale watching boat. Most of them were quite succinct when describing to me what sort of information they had shared. Caron told me, "I think just telling them about the whales and how, the numbers that we saw and how nice it was, and how we really enjoyed the trip having not been out there for a while." She added, "I enjoyed talking with you, too. I think I probably did talk to people about that as well." Max said, "We've told friends and family

who were all interested. We showed them our pictures." When prompted for more information, Max added, "I mean we just kind of told them about how it went, I mean, what it was like out there." Rita said that she told her parents because:

They were the ones who took me first and I said, oh, you know we went whale watching and they were just really interested to hear cause I don't think either of them have been since the last time I'd went with them."

Sheryl had the opportunity to not only share the experience and her pictures with her students when doing a unit on whales, but also directed her students' parents to the Web site of the company with whom she always traveled. Even though they lived in Indiana, Sheryl said that she often had parents approach her and say, "my child is insisting that we go to watch whales." Sheryl also told me several stories from the trip that she, Mary, and Patsy had shared with friends.

Like the others, Walt showed his pictures to friends and co-workers and also posted them on his Web site, but additionally he felt that it is his responsibility in doing so to try to make people care more about whales and realize their importance on this earth.

Talking About the Trip With Companions

All of the participants reported that they had talked about the trip afterwards with their companions, but also admitted that as life moved on, their reminiscing had tapered off if not completely stopped. Even so, many commented on some event that had made them think about the trip again. Rita said that she and Max talked about the calf breaching that "entire day because I just found it absolutely hysterical," but admitted that it was something that they talked about more in the "immediate thereafter" because "you know it's been a while and we've just got back from skiing so not really, but I'm sure it'll come up again." Still, Rita told me that she had just

stumbled upon a folder on Max's computer of pictures from their trip that very morning and that she looked through them and mentioned the trip to Max.

Sheryl told me about several instances where immediately after the trip she, Mary, and Patsy shared their remembrances about the trip, and also said that earlier that week Patsy had contacted her, explaining "she's getting ready to do some note cards and she sent a bunch of her pictures and said, 'pick which ones I should put on cards and things.'"

Walt said that he and Kat had been on several more trips together that season, and while they may not have talked about that one specific trip, they stayed in contact throughout the season as they planned and made future trips together.

Lasting Impressions of Educators

All of the participants mentioned the educators at some time during the Phase 2 interviews. For Max and Rita, it was the naturalist announcing during the trip who made an impression. As Max explained, "they would point things out, they could identify each [whale] and almost tell like their personalities and their family dynamics which was interesting. I never could have pulled that." Rita also said that the naturalist enhanced the trip, offering:

I think that it definitely enhanced the trip, made it better, I think that the system she had of working the boat out like a clock was just such a natural thing for people that it just really helps focus your attention. You know, if you're looking off in one place and you hear her say, okay 3:00, it's much faster and I think that everybody on the boat was able to see a lot more because she was good at what she does and she was able to tell you about whales but also help you really focus your attention to get the most out of your trip. I was really glad she was there. I thought it was great.

Caron's recollections were more vague, saying she remembered, "one of the girls was showing the baleen and explaining" but admitted she did not remember details. Sheryl's memories of the interns were more social in nature, having spent a considerable amount of time talking to some of the educators onboard that day. She remembered specific details that a few of the interns had told her about their personal lives and interests in the whales, but could not remember specifically what she had learned from them in terms of new knowledge about whales. Sheryl did say that the reason she went out repeatedly with this company in particular was the research that was conducted onboard by the educators and interns.

Walt's experience with the educators was qualitatively different. He did not interact with the educators who came around with the hands-on learning tools unless it was to answer questions that they asked him about whales. He did interact with Vivian, the naturalist onboard quite regularly, but felt that he had to "temper his opinion" of the naturalists because though they are "very good at what they do," they have to "stay within the constraints of what is known to science." Walt did not feel so constrained.

Physical Context

Long-term, reference to the physical environment centered on the value of the lived experience, whale behaviors, and the weather.

Value of Lived Experience

All of the participants of Phase 2 commented on the value of the lived experience. Caron characterized it as "more interesting to see it...whales are so amazing." Max, Rita, and Sheryl each compared the lived experience to more removed avenues of learning. Max told me that for him, "hands-on, on location learning has been a much better way than sitting in a classroom...you're more cognizant of the surroundings and what's actually going on. More in

context." Rita shared a similar opinion, emphasizing how the senses enhanced the experience in a way that "passive media" cannot. Sheryl also agreed that the experience was multi-sensory; "a whole different experience with sights and smells and sounds."

Recognition of nuances in whale behaviors

The amount of details recognized and remembered in the whale behaviors seemed related to the amount of prior experience. Rita, Max, and Caron shared specific memories they had of the whale behaviors. From this group, Rita's recollections were probably the most vivid as she related the breaching whale to toddlers in her preschool class. However, what each of them shared with me could be defined as broad strokes rather than nuances of behavior. Walt, on the other hand, admitted that he was now interested in subtleties:

Yeah, we all know you can look at the bottom of the flukes and identify them that way. I'm looking deeper, I'm looking at the individual little quirks in their behavior that you can identify a particular individual based on their behavior.

Walt gave a few examples:

I've got Coral pinned down. I know exactly what he does when he kick feeds. He gives two big tail flaps and does a tight circle to the right. Every time. Different ones have, there's one, Tornado, who does the crucifix maneuver. Where she'll come up, she'll kind of do a quick chin breach but she does it with the pec fins completely out, and she's got that sea serpent twist to her back when she's there, it looks like Jesus spread out on the cross, only horizontally, so that's that one.

Weather

Most of the participants mentioned the weather at some point during the Phase 2 interview. Rita described their day as "perfect," with "the right number of clouds in the sky."

Walt consulted his notes to remind himself of the day, having been on so many trips that season it was difficult for him to remember the specifics of that one of many days. Caron was less confident with her memories of the weather, thinking it was "maybe not real bright and sunny, but not overcast." Sheryl's memories of the weather that day were quite detailed when she talked about the storm and where they weathered the storm:

We found out that the corner behind the cabin, where like the garbage can was is not a good place to get out of the rain because the boat is moving and it all comes whipping around the corner and just whacks you right in the face.... Yeah, well we finally moved out of the front because it was really raining hard but we still didn't want to go inside that cabin because by then I think somebody had thrown up and that wouldn't have done us any good. So no, we just stayed at the back of the boat the whole time and there were a couple of other people out there, too, and we just had a great time.

According to Sheryl the weather was one of the most memorable aspects of their trip.

Conclusion

In this chapter, I presented the findings from two phases of interviews. Phase 1 interviews were conducted with five groups (eleven participants) of passengers and took place immediately before and immediately after a whale watching trip. Phase 2 interviews were conducted approximately six months after the initial set of interviews with five of the original participants. The findings were presented first by case, and then across-case, focusing on each of the three contexts in turn: personal, sociocultural, and physical. In chapter six, I present a discussion of the findings from this study, and offer suggestions for future research and practice.

CHAPTER FIVE: DISCUSSION AND IMPLICATIONS

Introduction

The purpose of this study was to explore the role of *personal, sociocultural,* and *physical* contexts on the short- and long-term experiences of adult participants in a natural, informal learning environment. In this chapter, I frame the findings by the study's research questions:

- How do the personal, sociocultural, and physical contexts influence participants' shortterm and long-term perceptions of the nature of their experience?
- How do the personal, sociocultural, and physical contexts influence participants' perceptions of their short-term and long-term learning?

In this chapter, I present the findings from each of these questions in turn by presenting the shortand long-term for each context individually (personal, sociocultural, and physical), and then by looking across contexts. Therefore, the findings will be presented in four parts (see Table 5.1). Following the findings, I discuss implications for research and practice. Table 5.2 presents a summary of the findings from this study.

	Short-Term (Phase 1)	Long-term (Phase 2)	
Perceptions of the	RQ1.1 RQ1.2		
experience	Personal	Personal	
	Sociocultural	Sociocultural	
	Physical	Physical	
	Across Contexts	Across Contexts	
Perceptions of	RQ2.1	RQ2.1	
learning	Personal	Personal	
	Sociocultural	Sociocultural	
	Physical	Physical	
	Across Contexts	Across Contexts	

Table 5.1 Presentation of Research Questions

Table 5.2 Summary Of Findings By Research Question Image: Comparison of Comparison

Research Question 1, P	Research Question 1, Part 1: How do the personal, sociocultural, and physical contexts				
influence participants' si	hort-term perceptions of the nature of the experience?				
Personal Context	Motivations linked to prior experience				
	• New experience: participating for fun				
	• Veterans: participating for fun, but also relationship with				
	whales				
	• Goals varied: take photos, "see some whales," have enjoyable trip				
	 Less experienced: general goals 				
	 More experienced: more specific goals 				
	Prior trips compared to current experience				
	• Future plans linked to experience levels				
	• Less experienced/moderately experienced: plans for future trip,				
	but no definite timeline				
	• Veterans: planning another trip the following week				
Sociocultural Context	• Social interactions with companions:				
	 Important to inexperienced and moderately experienced 				
	 Not mentioned as important by veterans 				
	• Participants had varying reactions to other passengers, including:				
	pleasurable, distracting, annoying				
	• Educators were social as well as educative				
Physical Context	• Static educational resources placed around boat were not utilized				
	• Passengers explored the boat very little				
	• Weather can play a role in perceived success; optimal weather is				
	influenced by goals				
Across Contexts	• Personal and sociocultural contexts:				
	• Interacted to enable participants to make meaning				
	• Effected how participants interpreted the experience				
	• Personal context influenced perceptions of other contexts				
	Mental and physical comfort important				
Research Question 1, Part 2: How do the personal, sociocultural, and physical contexts					
influence participants' lo	ong-term perceptions of the experience?				
Personal Context	• Follow-up behaviors linked to prior experience and interest				
	Recall linked to personal background				
Sociocultural Context	• Participants talked with companions about trip:				
	• Primarily soon after trip				
	• Less as time passed, though on occasion brought up				
	Recall linked to sociocultural identity Derticipants remembered social interactions with others				
Physical Contaxt	Participants remembered uncommon whale behaviors				
rilysical Context	Participants remembered uncommon whate behaviors Parcentions of experience influenced by weather				
Across Contexts	Personal and sociocultural identities played a role in memories and				
ACTOSS CONTEXTS	interpretations of the experience				
	 Different reactions to experience are likely, possibly based on 				
	interplay of the contexts				
	Interplay of the contexts				

	Table 5.2 Summar	v Of Findings By	Research Question	(continued)
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Research Question 2, P	art 1: How do the personal, sociocultural, and physical contexts			
influence participants' short-term learning?				
Personal Context	 Those with less prior experience and less prior knowledge reported more learning outcomes Except for the veterans, those with prior experience reported being reminded of information they had forgotten Veterans did not report gains in content knowledge 			
Sociocultural Context	 Inexperienced and moderately experienced participants reported educators as sources of content knowledge and social learning Veterans did not report any learning outcomes as a result of social interactions Participants did not report learning outcomes as a result of interacting with companions 			
Physical Context	 Participants valued lived experience as opposed to removed mediums (e.g., television, books, classroom) Hands-on learning resources cited as useful, added to the experience, and aided understanding 			
Across Contexts	 Experience for each individual was unique based on personal characteristics, as well as what was happening around them physically and socially Participants credited multiple sources for their learning that represented all of the contexts 			
Research Question 2, P	art 2: How do the personal, sociocultural, and physical contexts			
Personal Context	 Perceptions of their long-term learning? Perceptions about learning varied. Most reported learning about whales, many had forgotten exactly what they had learned Those with less experience reported more learning than those with more experience Participants recalled very few reinforcing events 			
Sociocultural Context	• Most participants thought educators and naturalist to be useful sources of knowledge, though admitted to forgetting much of what they had learned			
Physical Context	 Participants reported being situated in an authentic learning environment contributed to learning Hands-on learning tools were mentioned, though not as frequently as immediately after the trip 			
Across Contexts	 Long-term learning is difficult to determine Most participants did not report any subsequent reinforcing events on which to build their understandings Conversations with companions and others had tapered off, and for most the environment had offered no opportunities for elaboration 			

As discussed in Chapter Two, the three contexts that frame this research are personal,

sociocultural, and physical. The personal context considers the pre-existing characteristics that

learners bring to the experience as a major factor in what they get out of it. These characteristics, including motivations and expectations; prior knowledge, interests, and beliefs; and choice and control (Dierking, 2002), are different for each individual involved, and imply that the experience and learning outcomes will likewise be unique for each individual.

The sociocultural context includes within-group sociocultural mediation as well as facilitated mediation by others. *Within-group mediation* can include conversations and exchanges between any individuals, such as parents and children, and peer groups. *Facilitated mediation by others* focuses on interactions with educators, docents, and guides. These interactions are usually informal in nature, and are associated with facilitators who are perceived to be more knowledgeable about the particular field of interest.

The physical context includes orientation and advance organizers, design, and reinforcing events and experiences that continue to occur after an individual leaves the setting. Another aspect of the physical environment is the idea that in order to learn, it is important to feel comfortable in your surroundings (Falk & Dierking, 2000). This can include physical comfort, such as temperature, or in the case of a whale watching boat, the feeling of safety and stability. The design of the physical environment certainly affects visitor experience and learning, though not always in the way the designers intended.

Finally, and perhaps most importantly, events that reinforce the experience, weeks, months, even years later, can serve to support and strengthen learning and understanding as we continue to build on prior knowledge and experience. "Learning can be viewed as the neverending integration and interaction of these three contexts over time in order to make meaning" (Falk & Dierking, 2000, p. 11). Together, these contexts play a role in how people learn and make meaning in both the short-term and the long-term (Coble et al., 2005).

Research Question 1, Part 1

The first research question for this study was: How do the personal, sociocultural, and physical contexts influence participants' short-term and long-term perceptions of the nature of their experience? The following section addresses the participants' short-term perceptions of the nature of the experience.

Personal Context – Short-term Perceptions of the Nature of the Experience

Participants' personal characteristics and prior experience seemed to be an important consideration when looking at their short-term perceptions of the nature of their whale watching experience. In the following subsections, I will discuss how the characteristics and experience of the participants in this study influenced their whale watching experience.

Motivations

Participants gave a variety of reasons for going on the whale watching trip and for what they hoped to get out of it. The non-veterans mentioned having fun, spending time with family or friends, and being out on the water as the main reasons for their trip. In contrast, the veteran whale watchers explained that for them it was more of a compulsion and a very regular part of their lives, referring to the whales with personal terms such as "my whales" and "old friends."

It has been suggested that an individual's reasons for participating in a free-choice learning experience are mediated by their interests and prior experiences (Falk & Dierking, 2000). In this case, participants brought expectations for what they wanted to get out of the trip based on their interest and previous experience with whales, whether that "experience" was firsthand, or through exposure to information about whales through the media, school, friends, or some other means. This is aligned with Feinberg and Leinhardt's (2002) findings that visitors'

background characteristics and interests were an important element when looking at what visitors get from a experience.

The specificity of the reasons stated for coming on the trip appeared to be linked to prior experience. The less experienced whale watchers had more general goals, such as "get some good pictures" and "see some whales." Those with more experience were more specific in their goals, such as the desire to see and photograph a specific behavior or a particular whale. Some mentioned that they wanted to or expected to learn something, but none of the participants mentioned learning or education as the primary reason they were going on the trip. As stated by Falk and Dierking (2000), it appears that motivation continues to be an individual factor based on personal interest and experience.

Prior Experience

Those participants who had been on previous whale watching trips arrived with expectations and preconceptions based on their earlier experiences. Without any prompting, during the post-trip interview all participants who had been on previous whale watches compared the current trip with previous ones. Sometimes it was compared favorably, such as by Sheryl and Patsy who were excited about seeing breaching whales so close to the boat, a behavior that Sheryl had specifically mentioned she had hoped to see. Jay and Susan, on the other hand, felt that the trip they took together the previous year "was a little bit better." In fact, that first thing Jay said to me after the trip was, "I enjoyed it, but I think the first one we went on had more whale sightings."

Walt and Kat both had extensive prior experience, with well over 100 trips each. They had each characterized their first trips (or for Walt, his "first trip in the modern era") as

transformative events in their lives. Walt and Kat shared memories not only of previous trips, but overall impressions of previous seasons as compared to the current season.

Falk and Dierking (1992) suggest that individuals "continually define and refine their expectations of what to see and what to do" (p. 26) based on previous experiences. These experiences contribute to how visitors will evaluate the current experience. In this study, most visitors with prior experience expressed the desire to have a trip that hopefully surpassed, or at least equaled, their "best trip." Based on the findings from this study, it appears that if this does not happen, participants may express dissatisfaction with the experience.

Future Plans

There was very little indication that the participants were going to start doing anything differently as a result of the whale watching trip. With the exception of Mary, who said that she was going to encourage her own children to focus on whales instead of dolphins for their school projects and that she would not participant in balloon releases, none of the participants indicated plans to make any behavior changes. This was in contrast to participants in the pilot study for this research the previous year when I heard examples of how they planned to change their behaviors to be more environmentally aware. It is important to note however that those participants from the pilot study did not end up reporting any sustained behavioral changes six months later, though there were examples of changes in perceptions and attention. This is consistent with Ballantyne and Packer's (2005) findings that even when participants make behavioral changes, they are often short lived. One reason for a difference in planned behavioral changes immediately after the trip may be that there was a notable difference the previous year in how the naturalist emphasized not only environmental issues, but also changes that passengers

could make. This idea was not as strongly emphasized the year of this study, when there was a different naturalist onboard.

For most of the participants, future plans were limited to planning their next trip, and this seemed related to the amount and frequency of prior trips, as well as the recency and regularity of prior trips. Those passengers for whom this was their first or second whale watch had vague plans that they would like to go on another trip one day. Those for whom whale watching was a regular part of their lives, such as Sheryl who went once a year, and Walt and Kat, who went dozens of times each season, planned to continue to make future trips at the same consistent rate. These differences can be linked to research that suggests that people who participate in certain types of activities are likely to continue to engage in these types of activities (Chang, 2006; Falk & Dierking, 1992, 2000; Smith, Wolf, & Starodubtsev, 1995).

Overall Perceptions of the Experience

Overall, the participants who went on the whale watch mainly for entertainment purposes characterized the trip as successful. Data indicate that time did not change participants' perceptions of the whale watching trip. Those who had originally characterized the trip as entertainment continued to express that sentiment six months later and evaluated it in terms of entertainment. While all expressed a willingness to go on another trip, none seemed to have experienced any sort of life-altering transformations such as those described by Walt and Kat. Those for whom whale watching was a regular part of their lives (Walt, Kat, and Sheryl) indicated that they intended to keep it so. The idea that people will choose their activities based on their own interests, be those interests for entertainment or education, aligns with the very nature of informal learning environments, which emphasize the needs and interests of the individual over those of the institution (Coombs, 1973).

Sociocultural Context – Short-term Perceptions of the Nature of the Experience

The data indicates that social factors played an important role in how participants perceived the experience, though reactions to these factors were varied. Influences included interactions with companions, other whale watchers, and the educators on the boat.

Social Interactions

With the exception of the veterans (Walt and Kat), members of each of the other groups reported that spending time with their companions was one reason for the trip. Mary, Patsy, and Sheryl also spent considerable time interacting with other passengers and with the educators. As indicated in the data, these interactions were social in nature as often as they were educative. They talked with the people around them, and even shared their snacks with some of the children. Bryan also spent some time talking with other passengers, including social conversations with the educators. In contrast, Max and Rita did not directly interact with any other passengers or educators. Jay and Susan seemed to be somewhere in the middle, interacting with each other, talking with the educators when they were approached, but not seeking out social interactions with other passengers.

Kat and Walt expressed more interest in the whales themselves than with social interactions. That being said, they also indicated that they often went on whale watches together and sat together before and after, though during the actual sightings they were by themselves and were not seen to interact with other passengers. The rest of the participants expressed a major reason for the current trip was that it was a fun way to spend time with family or friends. While whale watching was obviously a part of the experience, their responses indicated that the social aspect was as important to most of them as was the whale watching itself.

Participants also mentioned an awareness of other people with whom they did not necessarily interact. Sheryl told me that she "had fun watching what the other people were doing." She and Mary mentioned watching children on the boat enjoying themselves, "or the parents missing it because they're making sure the kids aren't falling overboard." Rita, on the other hand, told me she was quite "shocked" by some of the "obnoxious" behaviors that she saw in other passengers, as well as some of the private boaters, who disregarded federal laws and behaved in such a way as to possibly endanger the whales by not cutting their engines, approaching the whales, and backing up with whales in the vicinity. Every participant I spoke with who was on a trip where private boaters were a problem echoed this frustration. Rosenfeld (1980), as described in Falk & Dierking (1992), found that "people-watching" is quite common in such social settings, and seems to be something that people naturally do and enjoy. Data in this study support this finding from the literature.

Physical Context – Short-term Perceptions of the Nature of the Experience

The data suggests that the participants of this study explored the boat and it's resources very little. The weather seemed to play a more notable role, with many mentioning the weather that occurred during the trip. It is interesting to note that optimal weather for a whale watching trip was not agreed upon by all participants.

The Boat

The galley area of the whale watching boat had a number of different sources of information about whales, the ocean, and various environmental issues. None of the participants were seen to enter the galley area except for Walt and Kat, who stayed in the galley during the trip out and back, only leaving during whale sightings. Overall, the participants in this study reported exploring the boat and it's offerings very little. Bryan left Caron for a while to go to the
lower deck, and he and Caron both spent some time in the wheelhouse with the captain. Jay and Susan, on the upper port side, and Max and Rita on the lower bow, never moved from their general area. Sheryl, Patsy, and Mary had intended to stay at their spot on the bow for the entire trip and only moved when they were forced to because of the storm. Even then, they did not go into the galley area.

Anderson and Lucas (1997) report that a sense of familiarity with ones surroundings in such an environment is important, and that making sure that people are oriented and familiar with what an environment has to offer will help people feel more comfortable and get more out of the experience. On the whale watching boat, an orientation time is inherently built-in to the experience with the "dock talk" given by the naturalist before departing that serves to orient the passengers to rules and expectations, and with the amount of time it takes the boat to make its way out of the harbor and to find the whales. Participants in this study indicated that the orientation session was useful, and other researchers have indicated that it is a useful activity (Rennie & McClafferty, 1995). Informal environments that do not have such inherent orientation times could consider finding a way to incorporate an orientation into the experience.

The participants in this study did not report much exploration of the boat, yet the data does not suggest that there were feelings of discomfort or disorientation while on the boat. This may be attributable to the amount of time that passengers had before the whale sightings begin. On the other hand, it might be that some passengers did not explore the boat because they had found a safe place and were uncomfortable with the idea of moving from that location. Further studies could investigate the reasons that participants choose to either remain in one place or to explore the environment.

Weather

Weather did seem to have an effect on the participant's perceptions of the success of the trip, though they did not all agree as to what optimal conditions would be. For example, reactions to one trip during the study were mixed. This particular trip was one that I had described in my notes as a "warm, windy day with mild waves." Max and Rita told me that it was a nice day, "a good day to be out on the water." Walt, who was on that same trip, characterized the weather as a disappointment with "nothing but clouds." Contrast this to Sheryl, Patsy, and Mary, who faced severe weather and said that it made the trip much more exciting for them, calling it a "great ending" to the day. As with other aspects of the trip, individual or group perceptions varied.

One consideration regarding the physical context is the importance of feeling safe and well in your surroundings (Hein, 2004). This speaks to the very base level of Maslow's hierarchy of needs (Maslow, 1999). While this can probably be taken for granted in most museums, some situated learning environments often have more of a sense of unpredictability, the context of this study being one example with regards to the weather and the conditions of the ocean. During this study, none of the participants mentioned discomfort in their surroundings. Many of them had taken precautions such as motion sickness pills or patches to ward off seasickness, and even those who went through the severe storm never mentioned any feelings of fear or the feeling that they were not safe. Reinforcing the safety and security measures associated with the context may help ensure that participants continue to feel good about the experience in this regard.

Across Contexts - Short-term Perceptions of the Nature of the Experience

Although for the purpose of the analysis I looked at each of the three contexts in turn, to do this is artificially removing the complexity of the experience. The three contexts examined here are interrelated and it is quite difficult to truly separate them out.

Each participant was an individual with their own unique set of characteristics that influenced how they perceived and interpreted the experience. Having said that, perceptions and interpretations also happened as the participants made meaning of the experience with their companions, through the help of the educators, or even through passing interactions or comments of other passengers. Vygotsky (1978) would argue that even when alone, individuals are still surrounded by artifacts of the culture, and to try to separate any individual from their sociocultural surroundings would be artificial at best. These cultural artifacts may make up the physical landscape, but they are mediated by the society that created them. For example, in the case of the whale watching boat, there were a number of societal agreements and rules that were understood by the regulars to this culture. For those new to the culture, rules were passed down both formally (through the dock talk before the trip, for example) and informally (through observations and interactions with the educators, companions, and other passengers who had more experience).

An example of these cultural rules can be seen with the actions of the private boats that were seen during several of the trips. As previously mentioned, the boaters were disregarding federal laws regarding whales and were behaving recklessly in a number of ways. The naturalist commented on these behaviors over the PA system, and many passengers could be heard talking about this during the whale watch. After the trip, all participants who witnessed this behavior commented on it and talked about how "stupid" the boaters were to disregard the laws that they themselves had only just learned. It could be that the inexperienced whale watchers were adopting an understanding of the cultural rules based on the reactions of the more experienced whale watchers and educators. Brown, Collins, and Duguid (1989) explain that "people, consciously or unconsciously, adopt the behavior and belief systems of new social groups" (p.

34). They contend that once new members of a culture have a chance to "observe and practice *in situ* the behavior of members of a culture, [they will] pick up relevant jargon, imitate behavior, and gradually start to act in accordance with these norms" (p. 34). It seems that this might be what was happening with passengers on the whale watching boat.

Participants reported social interactions with their companions to be very important, and in fact for many their reasons for going on the trip were social in nature. Participants told me that being able to experience the whale watch with their companions was important to them, and there was often a sense of a shared purpose even though they were asked individually why they went on the whale watch. At the same time, each person was still an individual and each came with some unique, and some shared experiences, expectations, and knowledge.

Reactions to the physical environment seemed also to be influenced by personal goals. For Walt, talking photographs was extremely important. His inability to get around the other passengers because they were "just hanging in the doorway" caused him to miss several photos. Likewise, the fact that it was an overcast day contributed to his frustration with that trip. Walt saw the physical environment as an impediment to his personal goals.

As mentioned earlier, different passengers had different interpretations of the weather, often based on their reasons for being there. With the exception of Walt, all of the participants approved of the weather, no matter what the conditions were. Rita, for example, said that the trip might have been different if the weather had been "bad." Sheryl, Patsy, and Mary, on the other hand, thought that it was the bad weather that made their trip more exciting. They had expressed to me earlier that they always have unexpected adventures when they go out together, so for them collectively, the severe storm fit into their preconceived notion of the type of adventure that happens when they spend time together. Evaluations of the weather may have differed because

the participants had different goals. For example, for Mary, Patsy, and Sheryl, a storm was considered a "bonus" because it "makes for a good story," and a good story was something that they expect when they are together.

A final consideration when looking across contexts is the realization that it is important for people to feel relaxed in their surroundings, both physically and mentally. A condition often described in the museum research literature is "museum fatigue" (Hein, 2004). According to Hein, museum fatigue was first described in 1916 and referred to the amount of bending, crouching, stretching, and kneeling required for a visitor to read all of the labels and see all of the objects in an exhibit gallery (Gilman, 1916), though it later came to include mental as well as physical fatigue. Stevenson (1991) did not see evidence of museum fatigue in his study of an interactive science center and concluded that the exhibits were "effectively holding the attention of its visitors" (p. 525). On the whale watching boat, passengers were constantly faced with the task of having to keep their balance, navigate the boat, find a spot suitable for whale watching while being aware of other passengers, while at the same time hearing information from the naturalist or being visited by the educators. Despite all of these activities, the data from the participants gives no indication of museum fatigue, suggesting that perhaps the experience presented optimal levels of stimulation without over-exertion, or simply that participants' reporting of their experience eclipsed their feeling of fatigue.

Participants expressed an appreciation for the educators, characterizing them as useful sources of information. There was no indication in any of my interviews that participants felt intimidated by the intellectual tone of the educators or the naturalist, and there was no mention of physical discomfort among the participants. All of those for whom seasickness was a potential problem had taken precautions, and even those who were on the boat during severe weather

never articulated any sort of fear that they were not safe. Rennie and Johnston (2004) contend that considerations of comfort are important because "visitors who feel intimidated by the... intellectual tone..., the noise level, an unfriendly physical layout, or apparently aloof attendants, will be less motivated to learn" (p. S7). In contexts like the whale watching environment, it may be even more important for educators to be more explicit about ways that the passengers are safe and also prepare them ahead of time for other issues that might arise (e.g., seasickness) by offering solutions prior to going on the boat.

Research Question 1, Part 2

The following section addresses the second part of the first research question by focusing on participants' long-term perceptions of the nature of the experience.

Personal Context – Long-term Perceptions of the Nature of the Experience

Six months after the trip, the data suggests that prior experience and interest remained an influence on follow-up behaviors and recall.

Follow-up Behaviors

It was evident from the data that for most of the participants, thoughts about the whale watch had diminished. Three of the five participants with whom I conducted Phase 2 interviews reported that the whales and the trip was an entertaining experience that across the board was remembered favorably, but without great detail or perpetuation. This is consistent with some research that suggests that without subsequent reinforcing experiences, the effects of a visit will be short-lived (Ballantyne & Packer, 2005). The importance of reinforcing experiences is supported by the actions of Sheryl and Walt, for whom whales played a part in each of their lives outside of the context of the whale watch itself. Sheryl taught a unit on whales each year in her sixth-grade science class, and brought out her photos and souvenirs from her various trips. Walt

expressed that his personal spirituality was connected with whales and therefore spent considerable time not only on whale watches, but also practicing his spirituality. It was their interest in whales that brought them to the whale watch in the first place, and the same interests that kept the whale watch in their minds long after the trip. Without subsequent reinforcing experiences, there is little evidence that any long-term changes in behaviors or perceptions will happen (Ballantyne & Packer, 2005). In the whale watching experience, as in the context of other informal learning environments, the question of how to enable reinforcing experiences while at the same time respecting the individual needs and interests of the visitors remains.

Detail of Recall

There was some variability in how much detail participants could recount of their experience on the boat. The data suggests there could be a relationship between how the passengers characterized the whales and their behaviors based on their own prior life experiences, with the amount of detail they remembered after the trip. For example, Rita had associated a series of behaviors between a mother and her calf with her own experiences as a pre-school teacher. Six months later, this was the memory that she recounted with the most detail. Caron, in contrast, admitted to remembering very few details about the trip she had taken six months earlier. She often said things like, "I can't remember right now," and "I probably did [learn something new] but I can't think right now." Caron's general and non-specific recall is similar to what Knapp (2000) found when looking at elementary school students 18 months after a field trip to a nearby forest and nature preserve. The students' memories were likewise general and non-specific. For example, students would say they remembered "learning about leaves," but could not elaborate on specific aspects of what they had learned. Falk and Dierking (2000) report of hearing hundreds of cases where prior knowledge figured prominently in individuals' recollections of some informal or free-choice learning experience. They give an example of a woman who was able to describe the mechanism of a swing bridge a year after seeing an exhibit on bridges in a children's museum. They explain that she had no inherent interest in bridges, and that the information had been dormant until she found herself waiting at a closed bridge and watching the mechanisms. Similarly, in this study when I asked the participants questions about their whale watching experience, they were recalling memories that linked to prior experience and prior knowledge. For Rita, it was the connection she had made between the whales and her experiences at work. For Caron, it was the more vivid experiences of fifteen years earlier. This data suggests that there may indeed be a link between prior knowledge, prior experiences, and perceptions of the experience.

Stevenson (1991), however, had somewhat different findings when looking at visitors of an interactive science center. He tracked visitors during their visit, interviewed them immediately following, and then again six months later. He found that six months later visitors had vivid recall of much of their visit, could recount details of what they did, as well as how they thought. Memories were episodic (autobiographical and experiential) in the short-term, but in the longterm there was some evidence that participants were forming semantic memories. In contrast, the participants in the whale watching study recounted more memories that could be categorized as autobiographical and experiential in the long-term (Phase 2) interview than they did semantic memories. One reason may be that the participants of Stevenson's study were able to report subsequent reinforcing experiences that strengthened and built upon their understandings. There was little report of such experiences by the participants of the whale watching study. Clearly,

there is much to be gained by further investigation into what types of experiences lead to elaboration.

Sociocultural Context – Long-term Perceptions of the Nature of the Experience

Sociocultural factors seemed to play an important role in perceptions of the experience, and recall seemed linked to sociocultural identity. Participants reported to have talked with their companions about the trip, and most recalled social interactions with others as pleasant experiences.

Recall and Sociocultural Identity

Anderson's series of research investigating long-term memories of World's Fairs (D. Anderson, 2003; D. Anderson & Shimizu, 2006a, 2006b) found that for people who visited a World's Fair over fifteen years earlier, their memories were "overwhelmingly dominated and mediated by the sociocultural identity of the individual at the time of the visit" (D. Anderson et al., 2003, p. 409). Members of the "Young Mother Culture," for example, were more likely to remember features of the World's Fair experience that were relevant to a young mother. Likewise, Rita recalled in detail her memory of a calf breaching, and how she associated that behavior with those of the toddlers that she teaches. As Anderson found, Rita's sociocultural identity as a teacher influenced her interpretation and memories of the experience. There is literature that suggests that memories are enhanced when they are linked to episodes that are personally significant (Knapp, 2000). This appears to be supported by the data in this study. *Social Interactions*

Most participants conveyed the idea that they were glad to have been there together, and that sharing the experience was an important part of the trip. At one point, Max said, " it was a day out just for the two of us so we were just having a good time together. I mean, even had it

not been whale watching," indicating that it was the time together that was the most important element. Indeed, decades of museum research indicates that visitors overwhelmingly come in social groups, accounting for 80-95% of all visitors (Hein, 2004). Further, social interactions are often cited as a reason for the visit (Falk & Dierking, 2000). Data in this study support this idea, particularly with regards to the inexperienced and moderately experienced participants in this study.

Physical Context – Long-term Perceptions of the Nature of the Experience

During the Phase 2 interviews, participants mentioned several factors relating to the physical environment, including extraordinary whale behaviors, and aspects of the weather. *Whale Behaviors*

All participants mentioned general whale behaviors they had seen, and most were able to share specific recollections of behaviors. Every participant of Phase 2 happened to have seen a whale breach on his or her respective trips, and every participant mentioned this as one of their first recollections. For example, when asked what he remembered most from the trip, Max said, "The one thing that really sticks out in my mind was…seeing the whales actually breach. I remember there was a young whale actually fully out of the water, that was pretty impressive." The data indicate that participants realized that breaching was an uncommon behavior to observe.

Weather Conditions

Weather conditions were also often mentioned in relation to the physical context. There appeared to be no change in participants' interpretations of the weather. Those who had found the weather agreeable on the day of the trip continued to hold that opinion. Rita recalled the weather to be "incredible" and "absolutely perfect," which were actually stronger words than she

had used directly after the trip. Sheryl immediately mentioned the storm when asked what was most memorable about the trip, saying that it "makes a good story." The sole participant, Walt, who had found the overcast day less than ideal for photography, was the only one during our long-term interview who did not comment on the weather that day other than to read his notes.

Overall, participants' recollections as they related to the physical context tended to be more vivid when they were tied to episodes that they had found to be personally meaningful. For example, Sheryl still reported the storm as one of her most vivid memories of her trip. This is consistent with other research concerning long-term memory in informal learning environments that suggests that episodic memories are more prevalent (McManus, 1993), and that long-term memories often include some aspect of environmental variables (Knapp, 2000).

Across Contexts – Long-term Perceptions of the Nature of the Experience¹

As previously mentioned, Anderson and Shimizu (D. Anderson, 2003; D. Anderson & Shimizu, 2006a, 2006b) found that the sociocultural identities of individuals at the time of their visit to a World's Fair had a strong influence on their memories. In other words, what people remembered from their visits had to do with "the realm of the culture that characterized who they were at the time of the visit" (D. Anderson, 2003, p. 409). However, Falk and Dierking (2000) say it is the physical context that participants are more likely to remember. No matter if the experience took place two days or twenty years earlier, "the most frequently recalled and persistent aspects relate to the physical context – memories of what they saw, what they did, and how they felt about those experiences" (p. 53). These ideas are complimentary if we consider

¹ Although Kat was not interviewed during Phase 2, she does make a brief appearance in this section for two reasons. First, during our interview in Phase 1, she was able to share stories, reflections, and hindsights due to the length of time she had been engaged in these experiences. Second, her transformative event had happened twenty years earlier, thus more than satisfying the "long-term" criteria.

that sociocultural factors may influence memories, but those memories tend to relate more to the physical context. For example, Walt's memories were tied to his sociocultural identity on the boat (that of an avid whale watcher) and his memories of the physical environment (the calf breaching, other passengers, the weather). Likewise, Rita's memories of the calf breaching and his "toddler behavior" (physical context) were tied to her sociocultural identity of being a teacher.

There seems to be the possibility of drastically different reactions to this kind of experience. Feinberg and Leinhardt (2002) suggest that, "the knowledge, experience, and social dynamics [people] bring with them...constitute an important element in the combination of influences on what people can 'take away'..." (p. 210). Caron, Max, and Rita indicated to me that it was a pleasant experience, a nice way to spend time with family and friends, maybe even a good learning opportunity, but it did not make any life-changing impact. For Walt and Kat, however, a single whale watching trip in the past had made such an impression that they were completely transformed by the experience and had made significant changes in their lives because of it – taking frequent trips, spending considerable amounts of money, and even characterizing it as an obsession. It is likely that a combination of factors contributes to such a transformation (Mezirow, 1991), including personal, sociocultural, and physical factors, though it would be very difficult to isolate these factors in order to really understand what leads to transformation.

Walt and Kat handled social interactions differently than did the rest of the group. Those participants who thought of the experience more as entertainment were more likely to deem social interactions important and expressed an interest in sharing the experience with others. For Walt and Kat, however, the way they linked others into their experience was more complicated.

Neither was seen to interact socially with anyone else on the boat during the whale watch, though both admitted to often talking about their experiences with friends and family. However, Kat had made a profession out of being a naturalist onboard a whale watching boat. In one respect, this position puts her above and away from the passengers, in more of a facilitating position. Walt said that he brought his experience to others through his spirituality. So while Walt and Kat were not necessarily interacting socially with other passengers, they were still sharing the experience with others, albeit from a more removed perspective.

Overall, most participants talked primarily about what they perceived to be spectacular whale behaviors (for those lucky enough to see some), followed by other aspects that spanned across the contexts -- who they were with, with whom they interacted (companions, educators, other passengers), where they sat and watched, and who was around them that might have caught their interest. Aspects of the experience that participants deemed unusual, special, or unexpected were remembered and shared with me six months later (e.g. the storm, breaching whales, reckless pleasure boaters, seeing NOAA tag a whale). Other studies that have looked at longterm memories of informal learning experiences have found a similar range of memories (D. Anderson, 2003; Knapp, 2000; Wolins et al., 1992). McManus (1993), for example, sent a letter to visitors of a hands-on art gallery asking for "help by writing about your memories of your visit." This uncued approach to eliciting memories was used as a way to get a wider range of memories than what might have been obtained with a structured interview. McManus found that two to ten months after their visit, 51% of the visitors' memories were related to "objects or things" in the gallery, 23% were related to episodic events (such as "doing something," enjoying something or someone, interacting with others), and 15% were related to feelings at the time of the visit. Similar categories of memories were evident in the data from this study.

Research Question 2, Part 1

The second research question focused on how the personal, sociocultural, and physical contexts influenced participants' perceptions of their learning in both the short- and long-term. The following section addresses the participants' short-term perceptions of learning.

Personal Context – Short-term Perceptions of Learning

Personal background, particularly in terms of prior knowledge and experience, seemed to play an important role in what the participants learned during the whale watching trip. Those with more to learn appeared to have learned more. The converse was also true.

Influence of Background

Learning appeared to be associated with the amount of prior knowledge and experience. Immediately after the trip, many participants told me that they had learned a lot. Some seemed surprised by the amount that they had learned, particularly since "education" or "learning" was rarely mentioned as a primary reason for going during the pre-trip interviews. This is in contrast to literature in museum studies, which shows that education is one of the most commonly mentioned reasons for going to a museum (Falk & Dierking, 2000). The fact that the context of the whale watching boat might not have been thought of as an educational opportunity beforehand may speak to some differences of perceptions between a museum and a situated experience, indicating that people may not necessarily think to go whale watching to learn, rather it may be a by-product of the experience, unintended or unexpected.

Mary, for whom this was her second whale watching trip, said "I learned a lot." She went on to describe however not necessarily facts associated with the whales, but more of her own ability to spot the whales before her companions:

I learned a lot, and nobody will believe me but I saw two whales off the side of the boat at one point, they didn't believe me but I did, and I never could see them other than that until the other time I saw them and I was right, and then I was the one that saw the one that was breaching, and then I got the NOAA one before you. So I'm very proud of myself. I learned a lot.

Mary perceived her improved ability to spot whales as something she learned during the course of the trip, which she emphasized by bookending her story with, "I learned a lot." Paris (1997) would probably agree that Mary had learned, recognizing that affective reactions constitute learning by extending our understanding in personal ways.

Caron, though moderately experienced, said that she knew "some of it [before], but I mean I did learn some new information as how they take in so much water and about that feeding and all that." Other participants also reflected on prior learning, and commented that the trip served as a reminder of forgotten information. As Bryan commented, "I have heard a lot of it, years ago, and um, and I forgot a lot of it." Jay shared a similar sentiment, "A lot of the stuff I'd heard before but I'd forgotten about, but you know once they said it I pretty much remembered."

Walt and Kat, the veteran whale watchers, did not think they had learned anything about whales from this particular trip, though as Walt explained, "I'm not sure that I necessarily learn something on every trip, or if it's that every trip is different. The experience is different, and you know I guess if you learn from the experience then that's something."

Learning outcomes for the participants did appear to be linked to prior experience, knowledge, and interest. Those passengers who had less whale watching experience and less prior knowledge, but high amounts of interest reported more learning outcomes than those who were more experienced (none of the participants expressed disinterest). Several studies have

looked at the relationship between interest and learning, and all have found that the most learning gains happen when visitors have high interest, but low prior knowledge (Falk & Adelman, 2003; Storksdieck, 2006).

Falk and Storksdiek (2005) found a link between prior knowledge and learning: the more that visitors knew before, the less they learned from the experience. The converse was also true: the less that visitors knew before, the more the learned from the experience. It seems reasonable to assume that when there is more to learn, more learning will happen. This seems to be the case in this study. The more inexperienced passengers all told me that they felt like they had learned a lot from the experience. For those passengers who had been whale watching before, many of them said that they were reminded of information that they had known before but had forgotten. Those with extensive experience did not report to have learned anything from the trip.

Sociocultural Context – Short-term Perceptions of Learning

With the exception of the veteran whale watchers, most participants referred to the naturalist and educators as sources of information. The participants did not credit interactions with companions or other passengers as sources of constructed knowledge.

Learning From Naturalist and Educators

While veteran whale watchers did not report any learning outcomes as a result of interacting with the educators, the inexperienced and moderately experienced participants who interacted with the educators credited them as sources of information and learning. Sheryl commented that, "they didn't wait for you to come to them. They came to you. They want you to learn." This was contradicted however by Rita and Max when Max said, "I saw people up front who had the baleen and the other, they were talking mostly with the kids.... We didn't go up and speak to them at all." Bryan mentioned that something new to him "was when they passed

around the baleens and...the little rubber sand eels." A number of these participants were seen to actively seek out the educators to question them. Jay said it was the educators who helped him make meaning of the experience, explaining that the lived experience "is impressive," but one would not understand it without "the samples they brought over and show you...it pretty much explains it all." Max and Rita, the only participants in this group who did not interact with the educators, credited the naturalist for much of their learning, particularly saying that her announcing gave them context to "focus my attention."

If we step back to consider a broad definition of learning that considers social and cultural dimensions (Falk et al., 2004), there were considerable amounts of social interactions between the participants and the educators that involved learning about each other's backgrounds, their motivations for being there, and sharing previous experiences. For example, Sheryl, Mary, and Patsy indicated that they spent some time talking with several of the educators and told me later what they had learned about them. Bryan also told me that he had enjoyed talking to one of the educators from Georgia and shared what he had learned about her and some things they had in common.

Learning With Others

While there were many stories about how the passengers learned from the educators, the data indicate that there was no real sense that the passengers were aware of any learning that had occurred as a result of their informal interactions with their companions or other whale watchers during the trip. There may be several reasons for this. Heimlich (2005) suggests that often what it comes down to is a lack of awareness that we are learning; learning just seems to happen as we live our lives. Another idea that builds on this assertion and embraced by Leinhardt and Crowley (1998) is that "for every insightful intellectual leap, there are thousands of mundane moments of

learning where we cobble together bits of observation, demonstration, and conversation that we picked up through social interaction" (p. 13). Again, this often happens without our being consciously aware of it and the data in this study corroborate this literature.

Physical Context – Short-term Perceptions of Learning

Participants repeatedly mentioned that their learning was enhanced because of the value of the lived experience: by being there in person as opposed to learning by more removed mediums such as television, books, or the classroom.

Lived Experience and Learning

Many participants mentioned seeing the whales in person and the effect this had on their learning. For example, Max told me that he had seen documentaries that showed whales making bubble nets to trap fish but it was something he had never seen before, and that seeing it firsthand enhanced his understanding of how and why they do this.

Likewise, the hands-on learning resources were often cited as useful tools in helping passengers understand principals they were learning about. Patsy explained that she had known about baleen and had heard about it extensively on her week-long Alaska trip earlier that summer, but that she had never seen it or felt it before, adding that it was not until she held a plate of baleen in her hands that she was able to say, "I understand it now, how it works." As Hein (1999) explains it, active participation is essential for building knowledge. In this case, the passengers were using "both their hands and their minds, to interact with the world, to manipulate it, to reach conclusions, experiment, and increase their understanding" (p. 34). Hein suggests that it is not important that these understandings conform to an external agreement of truth as long as they make sense to the learner's constructed reality. Data from this study support Hein's assertion. Finding ways to further integrate the physical with the cognitive and emotional aspects of the whale watching experience would likely enhance active participation and the building of knowledge even more.

Across Contexts – Short-term Perceptions of Learning

One interesting aspect of exploring learning in an informal learning environment is that the "treatment" for each visitor is unique (Schauble et al., 1997). In this study, every passenger on the boat had a different experience and was exposed to different stimuli. This included the "delivered" learning program by the naturalist and educators, plus any number of factors that made each trip different: the weather conditions, the behaviors of the whales, the different passengers onboard, different perspectives while watching the whales, and of course the personal characteristics of each passenger, to name a few. Considering these differences, it could be argued that any learning that happened occurred as a result of the experience itself and not necessarily the intended design (Storksdieck et al., 2005). Just as constructivist museums allow visitors to forge their own path and have no right or wrong way to use, move through, or interact with the exhibits (Hein, 2004), so did the whale watching boat give passengers the opportunity to link new knowledge with prior knowledge and to make connections to what they already knew.

This uniqueness in treatment is one aspect of why evaluating learning outcomes is so difficult in informal learning environments. Falk (2004; 2005) believes this is further complicated by the fact that it is often difficult to pinpoint the source of an idea or understanding because learning is cumulative and builds from multiple sources, and suggests that instead of asking what an individual learned from an experience, we ask how the experience contributed to the individual's overall understanding.

Some participants seemed to seek out information more than others, asking questions and engaging the educators. Others were content with what was "delivered" to them, either by the

educators, or by the naturalist via the PA system. If we consider the personal context when examining this point, there were two participants, Walt and Kat, who could be considered experts in this area and were probably equally if not more knowledgeable than some of the educators. Considering the less and moderately experienced participants, it is difficult to know why some were more active in seeking out information than others. All of the participants indicated that they were interested in learning about whales, and most indicated that they had knowledge to gain in this area. It could be that for some, social interactions with their companions were the more important aspect of their trip; therefore seeking out interactions with others was of less import to them. One way that educators could facilitate learning, particularly in situated environments, is to ensure that all visitors are approached and offered additional information and the chance to ask questions, even if all offers might not be accepted.

Despite this lack of information seeking on the part of some, all of these participants reported that they had learned something. For Walt and Kat, it was not information about whales that they gained. Walt explained that he thought that he did not necessarily learn something on each trip, but that since every trip is different, he did learn from experience as a whole. Kat's learning had more to do with social watching, saying that she could not say that she had learned anything, but added, "some of these small boaters are really stupid." These outcomes are aligned with the broad definition of learning that was embraced in this study and described earlier.

Most of the other participants credited the situated nature of the experience with their learning, citing the whales themselves, the onboard education, hands-on learning tools, interactions with the educators, and the naturalist as primary sources of their learning. In fact, in no case was just one of these factors mentioned alone, rather several were brought up as interrelated aspects that contributed to participants' learning. This indicates an interplay of the

sociocultural and physical contexts on the personal context (i.e. learning). For example, several participants mentioned the baleen that the educators brought around. The educators not only explained how the baleen worked, but let also let passengers hold the plate in their hands and ask questions. Later, the naturalist would point out the baleen plates in the open, feeding mouths of the whales. Passengers were able to see the whales take in the water and food, and then use their baleen to filter feed. Both Rita and Mary described this type of experience as engaging many of the senses, with Mary explaining, "I think everything is involved, and I think you learn more [as a result]...this was complete."

Falk et al. (2004) describe four dimensions of learning that they found when looking at interactives and visitor learning: knowledge and skills, perspective and awareness, motivations and interests, and social learning. These dimensions of learning were also evident for the participants in this study. It is important for educators in informal environments to understand that learning is not always, nor should it always, focus on content knowledge. Though content knowledge is certainly important, it could be argued that the other dimensions (perspective and awareness, motivations and interests, and social learning) are more likely to sustain over time, and to bring people back for another visit.

Research Question 2, Part 2

The following section addresses the second part of research question two by focusing on participants' long-term perceptions of learning.

Personal Context – Long-term Perceptions of Learning

In the long-term, most participants reported that they had learned something on the trip, though there were varying degrees to which participants could remember details. Most participants were able to recall few reinforcing events that happened subsequent to the whale watching trip other than reminiscences with companions or telling others about the experience. *Varied Perceptions of Learning*

With the exception of Walt, all of the participants interviewed during Phase 2 said they had learned something specific about whales that day. Those with less experience told me they felt they had learned more than did those who had more experience (in this case, Walt and Sheryl). For example, Walt told me that he learned something new everyday, but did not report learning anything new specifically about whales that day. Sheryl, who was already quite knowledgeable about whales, told me that she remembered learning "one or two new facts" but could not recall exactly what they were, saying she had probably already incorporated them into her "old knowledge."

Caron told me that she remembered learning a lot, but also could not remember what. Max, after recalling the reckless behavior of some of the private boats, said that he had learned about laws that protect the marine sanctuary and how people interact with wildlife. Rita said that she learned that she definitely wanted to "do it again," and rather than learning, she was more reminded of a connectedness "to other things in the universe." What the participants reported in this study is consistent with literature that contends that informal learning environments often serve to reaffirm, reinforce, or validate previously held beliefs and attitudes (Storksdieck et al., 2005), but that knowledge and skills may not persist over time (Falk et al., 2004).

This range of learning is indicative of the personal context in an informal learning environment. As mentioned earlier, every person brings their own characteristics to a setting, and these characteristics may even involve each individual's personal views about knowledge and learning (Falk & Dierking, 2000). Some people tend to be more aware of their learning than

others, and some may even have a different idea of what constitutes learning. In fact, the informal learning arena often has quite a broad definition of learning which can include "knowledge, skills, aesthetic responses and emotions" (Hooper-Greenhill, 2004, p. 163), and considers personal learning goals that can include "encouraging curiosity and exploration, changing attitudes, evoking feelings, developing a sense of personal, cultural and community identity, and making decisions about moral and ethical issues" (Ballantyne & Packer, 2005, p. 282). Still, as mentioned earlier, learners are often simply unaware of their own learning, particularly when they are engaged in the setting (Heimlich, 2005), and probably more so in the months that follow.

Reinforcing Events

Another possibility as to why it was difficult for some of the participants to recall what they had learned six months earlier is that for many of them, once the trip was over and the reminiscing had tapered off in the immediate aftermath, they could recall few or no reinforcing events to strengthen what they had learned, and no new information in this area on which to build (Ballantyne & Packer, 2005). A lack of reinforcing events has been identified as one of the shortcomings of informal learning environments (Aldeman, Falk, & James, 2000), though it is certainly not always the case. Falk and Dierking (2000) described two visitors who continued to make connections five months after visiting the Smithsonian Museum of Natural History, and were able to discuss how they constructed additional knowledge and understanding based on their short experience in the museum and subsequent reinforcing experiences. Having said that, each of them had constructed different understandings after their visit, attesting to the influence of the personal context on learning.

It is unclear why the participants were, for the most part, unable to share stories of subsequent knowledge building. It may be that this particular context – whale watching – is less suited toward subsequent reinforcing events because one does not come across many incidents of whales in the news or in everyday life. Still, many participants had shared with me their prior exposure to whales in the media, so we could also assume that the information is indeed out there. We might conclude that subsequent reinforcing experiences are out there, but are unpredictable. It is certainly possible that the participants have simply not yet been presented with them.

Sociocultural Context – Long-term Perceptions of Learning

Participants gave considerable credit to the onboard educators and the naturalist for their learning. Participants said that the educators were useful resources, and though they had forgotten much of exactly what they learned, many did report that they felt like they had learned a lot from them.

Learning From Naturalist and Educators

What appears in the long-term data regarding sociocultural learning was more of the participants' interactions with sources of information. In other words, participants indicated that the naturalist and educators were sources of information and that they enhanced their learning experience, although they were not always able to tell me exactly what is was that they had learned from them. Again, this is in agreement with Heimlich's (2005) claim that people are often unaware that they are learning, particularly when "there is no universal agreement about what learning is, how it happens, and when or where it occurs" (p. 261). Data in this study support this finding in the literature; many participants were unable to talk explicitly about what they learned on the whale watching trip.

Max and Rita recalled that they did not interact with the educators, but told me they were impressed with the naturalist who was announcing over the PA system during the whale watch. Rita characterized this information as "helpful" and "interesting," but did not characterize her outcomes as learning. Max also recalled being impressed with the naturalist's ability to "identify each [whale] and almost tell like their personalities and family dynamics," and said that without her, "it still would have been fun but I clearly wouldn't have learned as much." Caron remembered, "one of the girls was showing the baleen and explaining," but admitted that she could not remember specifically what she had learned that day. Sheryl indicated that her interactions with the educators were mostly social in nature. If we take the broad view of learning embraced by many informal learning researchers that includes social and cultural dimensions, learning about others, developing interest and curiosity, growth of personal identity, as well as content knowledge and process skills (Ballantyne & Packer, 2005; Falk et al., 2004; Schauble et al., 2002), then we might conclude that some learning may have occurred but that the participants may not have perceived it as learning. As will be discussed in a following section, future research might explore how participants themselves define "learning," or researchers might use different types of questions that specifically address the various types of learning they are interested in exploring.

Physical Context – Long-term Perceptions of Learning

The participants of Phase 2 indicated that they felt that being situated in the natural environment and interacting directly with the learning tools contributed to their learning. *Situated in Natural Environment*

Four of the five Phase 2 participants (Rita, Max, Caron, and Sheryl) indicated that being situated in the natural environment contributed to their learning. Further, in order to contrast it

with the lived experience, most of the participants offered examples of what they thought of as more removed learning sources, including television, books, and other types of "passive media" (as described by Rita).

Several of the participants mentioned that being there in person engaged multiple senses, with words like "feeling," "seeing," and "smells and sounds" being offered as examples of the different senses that were involved during the trip. Sheryl commented that those qualities made it "a whole different experience...than just looking at it on a screen," and wished that her students could take such a trip. Max shared a similar sentiment when he said, "it's much more immersive actually being there."

Piaget believed that in order to learn, we must be actively involved in our surroundings (Piaget, 1974). Further, the context in which learning happens is a fundamental part of that learning (Comings, Comings, & Smith, 2004). The participants in this study compared the lived experience with more removed or symbolic experiences (i.e. television, books), and rated the lived experience as more powerful and engaging. This idea parallels the argument that has been made by some researchers regarding the problem with the abstract nature of traditional, formal education and the call for more meaningful activities within formal education (Brown et al., 1989; Hein, 2004; Resnick, 1987).

Hands-on Learning Tools

The hands-on learning tools were mentioned, though not as frequently as they were during the Phase 1 interviews that took place immediately after the trip. In fact, during the Phase 2 interviews, participants tended to distinguish less between the lived experience and the handson tools. At times they were mentioned in conjunction with each other, such as when Max said, "T've always found hands-on, on location learning has been a much better way then sitting in a

classroom." Several researchers have argued that optimal hands-on learning involves more than just a simple physical action of the hands (Duckworth et al., 1990; Hein, 1999). Instead, there is the need for "minds-on" as well as "hands-on" that emphasizes attention, time, and engagement in addition to physical action. In this case, the hands-on tools were one element intended to enhance the lived experience. The educators promoted this idea by asking passengers to make guesses and assumptions about the objects they were showing them in order to encourage the "minds-on" aspect. Educators working in informal learning environments should be aware of the dual impact of "hands-on" and "minds-on" when incorporating learning tools into the environment and try to find ways to engage the mind as well as the hands.

Across Contexts – Long-term Perceptions of Learning

It is difficult to know what learning happened in the six months that passed between the experience and the interview. Most of the participants did not report any gains in knowledge or understanding, could think of few subsequent reinforcing experiences, and failed to make any behavioral changes as a result of the experience. This is not to say that these things may not still happen. There is not cut-off point at which the possibility of learning ceases. It could be that the participants will still learn yet, and it could be that they had learned, but were simply unaware, or unable to recall at the time that I spoke with them.

As with short-term learning, it is apparent that the learning process is "interwoven with a variety of...individual and contextual elements" (Neuman, 2004, p. 517). While personal characteristics, such as background, interest, prior experiences, and goals certainly have an influence on what an individual takes away from an experience (Allen, 2004), so too do those subsequent experiences that are mediated by the people and the world around us (D. Anderson & Shimizu, 2006a; Storksdieck, 2006). I have already discussed how each individual had a

different experience onboard, not only because most were on different trips, but also because of their personal characteristics going in, their vantage point, the people who surrounded them, and those with whom they interacted.

What complicates the investigation of long-term learning is that each participant had six months of experiences after the trip on which to continue to build understanding and make meaning, or even to interfere with their recall and remembrances. If we believe that learning takes place in those small increments and mundane moments as we live our lives, often without our own awareness (Heimlich, 2005; Leinhardt & Crowley, 1998), it makes it very difficult to believe that long-term learning can ever be pinpointed to one point in time, although perhaps we can recall times when those many mundane moments lead to "intellectual leaps" (Leinhardt & Crowley, 1998, p. 13). Rennie and McClafferty (1996), however, question whether learning has even occurred if people can't "link that knowledge to situations beyond their visit" (p. 74) [as quoted in Anderson, Lucas, and Ginns (2003)].

Educators in informal learning environments face some challenges when dealing with the unique aspects of the visitor. Recognizing that the visitor may have different goals than those of the educators, it may be important to recognize the diverse goals of the visitors and have a better understanding of those different types of goals in order to help create a rewarding experience. At the same time, the importance of forwarding the institution's educational agenda should not diminished by the personal goals of visitors. Finding a way to blend these different purposes becomes the challenge of the educator, as well as finding ways to incorporate or encourage subsequent reinforcing events to promote further learning and elaboration.

Implications for Practice

The primary goal for this study was to investigate two main areas as related to informal learning environments: (1) the perceptions people have of an informal, situated learning experience, and (2) what people learn from such an experience. The results of this study indicated three main areas to be addressed. First, that learning is an extremely messy and complicated concept to assess, particularly in an informal environment. Second, that facilitated education can play an important role in what people take away from an informal learning experience. Finally, reinforcing events after an experience in an informal learning environment are critical for visitors to continue to make connections and build upon learning and understanding.

Learning Is Messy

"Learning" is not an easy concept to define. There are countless definitions of "learning" and few of these are in complete agreement. The online Oxford English Dictionary (2008) defines learning as, "the action of receiving instruction or acquiring knowledge... which leads to the modification of behaviour or the acquisition of new abilities or responses...." Merriam and Caffarella (1991) view learning as a change in behavior, or a potential change in behavior. Falk and Dierking (2000) criticize most definitions of learning, contending that they emphasize "basic cognitive and biological processes" (p. 56) while downplaying the importance of context. They call for a broad definition of learning that includes:

Shifts in attitudes, values, and beliefs; aesthetic understandings; psychomotor skills, such as discovering how it feels to turn a pot or play an instrument; social/cultural dimensions such as learning about someone in your family; and process skills such as thinking critically and refining one's learning skills.... (Falk et al., 2004, p. 172)

Likewise, Schauble et al. (2002) maintain that definitions of learning should include "an expanded sense of aesthetic appreciation, the development of motivation and interest, the formation and refinement of critical standards, and the growth of personal identity" (p. 425). These last two definitions emphasize engagement and involvement as a fundamental part of learning, recognize personal motivations and interest, and extend far beyond content knowledge. While these definitions of learning may be more indicative of the types of learning that happens in informal learning environments, it is perhaps just as important to understand how participants in these environments view learning, particularly when we are asking them to talk to us about what they learned.

During the Phase 1 interviews, participants of this study provided examples of what they perceived to be "learning." Their ideas were often examples of what are typically categorized as declarative ("knowing that"), procedural ("knowing how"), and conditional ("knowing when and why") knowledge (Woolfolk, 2007), with an emphasis on declarative and procedural, particularly for those with less experience. During the Phase 2 interviews, there was less evidence of these types of learning—several participants reported that they knew that they had learned something on the trip, but were unable to remember exactly what it was that they had learned. Some might argue that if the learning did not last, then they had not really learned (Hein, 2004). In fact, Hein suggests that "memory may be a better indicator of cognitive change than short-term recall of what must necessarily be rather superficial information" (p. 129). However, it is important to point out that if we presume that the participants' ideas of what constitutes learning had not changed in the six months that separated Phase 1 and Phase 2, then we can surmise that they might be focusing once again on declarative, procedural, and conditional types of learning when trying to remember what they had learned.

If "learning" is a difficult concept to define, it is even more difficult to assess. A commonly held view of learning in the informal learning literature is that learning happens in small, incremental stages that are often outside of our own awareness (Heimlich, 2005), and that learning can continue to happen long after an experience as people continue to build on their knowledge through subsequent reinforcing events (Falk & Dierking, 2000; Storksdieck, 2006). If this is so, then this makes it quite difficult for researchers to understand learning when even the individuals themselves are often unaware of it.

To better understand what it is that people take away from an experience in an informal learning environment, perhaps educators should focus more on what visitors hope to get out of the experience and how their interpretation of the experience meets those goals. This is not to say that designers of such environments should have no teaching goals of their own, rather these goals should be one consideration in the design rather than the sole consideration, and that learners themselves should be the ultimate judges of the success of that environment based on their own goals.

Role Of Facilitated Education

The data from this study indicate that facilitated education can play an important role in a visitor's experience. Most participants in this study mentioned the hands-on learning tools and the educators or naturalist in some capacity. Most of the participants indicated that the educators or naturalist were important sources of information, as well as pleasurable sources of conversation and social interaction. This is different from what is presented in the literature where the role of interactives and hands-on learning tools has a more prominent place than do social interactions that accompanied those resources. This could be due to the fact that most of the literature in this area focuses specifically on museums (Chang, 2006; Feher, 1990; Rennie &

McClafferty, 1995; Stevenson, 1991), where the educators are typically behind the scenes, rather than the ones delivering the learning tools as was seen on the whale watching boat. On the whale watching boat, the naturalist played an important role in the delivery of information. All passengers heard the naturalist's voice, and it was the naturalist who determined what information to share at what time, trained the educators, and conveyed the mission of the organization. Considering that so many of the participants in this study mentioned the educators or naturalist as a factor that contributed to their experience, educators in other informal learning contexts might consider spending more time engaging with their visitors.

It should be noted that while interactions with educators appear to make a difference with perceptions and learning, the impact across different educators may or may not be the same. I noticed a noteworthy difference in how the participants of this study responded to questions related to their environmental behavior changes and intentions versus responses from the participants of the pilot study the previous year. Specifically, the participants of the pilot study described more environmental intentions immediately after the trip, and cited more examples of attention to environmental issues when I talked with them again six months after their trip. The notable difference between these two studies was that there was a different naturalist on-board.

Despite the inconsistencies between the pilot study and the data presented for this study, there is evidence in the literature that an environmental education program can influence behavior and intention. Orams and Hill (1997; 1998) explored the effect of an education program enacted at an island resort in Australia. They found that educating visitors had a considerable impact on behavior changes. The resort realized that merely posting rules to keep visitors from inappropriately feeding the dolphins that live in that area was not effectively stopping these behaviors. After enacting the education program, they found non-compliant behaviors

significantly reduced, and that visitors had more intentions to follow up with environmentally responsible behaviors after the visit than did their counterparts who had no interactions with the naturalists or volunteers.

With this in mind, it seems important to look at various ways that information is "delivered" to visitors of informal learning environments, and how these different sources of information convey the goals of the experience and as well as how they facilitate learning. The whale watching boat had considerable amounts of useful information placed around the galley area of the boat, but the participants in this study admitted to investigating the boat very little, and none reported reading any of that material. Instead of simply posting material, educators of informal learning environments should also incorporate such information into their interactions with visitors, particularly that information that is deemed important to the mission of the organization. It may also be useful to consider other ways that information can be delivered more consistently.

Reinforcing events

Reinforcing events are considered crucial for learning to happen (Rennie & McClafferty, 1995). While an experience in an informal learning environment might set the stage, it is in many ways incomplete until people have the opportunity to "make sense of this understanding as events in the world facilitate and demand" (Falk & Dierking, 2000, p. 140). The reinforcing events will often be quite different for each individual as they come across sources in the course of their lives. Some may seek out more information, and others might come across it unexpectedly. Still, it is these reinforcing events on which people continue to build meaning and understanding.

With a few exceptions, the participants in this study were unable to tell me about reinforcing events that had happened in the six months following their initial experience. As such, they were also unable to report any substantial gains in knowledge or understanding. This is not to say that the possibility of such events has ended. There is no point where the potential to learn has passed; enabling contexts can happen months or years later (Falk & Dierking, 2000). For institutions with a strong message, however, it is worth exploring the possibility of facilitating reinforcing events through some type of follow-up with visitors. Such follow-ups might include invitations to future events, or a mailing list or newsletter highlighting programs, recent research, or in the case of the whale watching company, recent sightings and whale activities.

Implications for Research

There are a number of considerations for research derived from the findings of this study. First, when asking people to self-report on learning, there needs to be a clear understanding of how the participant is defining *learning*. Second, though it may seem artificial to separate out the personal, sociocultural, and physical contexts while at the same time contending that these three contexts heavily influence each other, it is important to look at these contexts in turn in order to get an idea of their breadth and depth. Third, when looking at perceptions and learning in informal environments, several factors regarding data collection should be kept in mind, including the interview timetable and participant attrition. Finally, I present some ideas for future research.

Views of Learning

Researching *learning* in any setting is complicated, but doing so in an informal learning environment adds to the complexity for a number of reasons. First, the learning that may occur in

such an environment can be difficult for a visitor to articulate, particularly since definitions of learning tend to vary among individuals. Second, every experience will be different based on each individual, the people who surround them, and the physical setting itself. Further, subsequent opportunities to build on experiences will be different for each individual. These same characteristics, however, that make exploring learning in informal contexts so complex are also the very ones that make it so interesting to investigate and so vital to understand.

In order to get a better idea of what participants are referring to as "learning," it could prove useful for future researchers to articulate a clear idea of what they mean by *learning* to the participants, either with definitions or examples that reach beyond standard cognitive outcomes, or even by using words other than "learning." For example, instead of asking, "what did you learn?" the researcher could ask a series of questions that specifically address characteristics of learning that include cognitive, affective, behavioral and social aspects (Rennie & Johnston, 2004). Researchers might also look for changes in knowledge and skills, perspective and awareness, motivations and interests, behavior, intentions, as well as social learning. *Separating the Contexts*

When analyzing the data for this study, I often found it difficult to separate out the contexts; it seemed artificial to look at each context in turn while contending that the contexts are inextricably interrelated. At the same time, I found it important to do so in order to demonstrate the depth and breadth of the contexts in and of themselves. This speaks to the complexity of the task of trying to represent each context as well as how those contexts interact (Rennie & Johnston, 2004). It would certainly be easier to concentrate on only one of the contexts presented here. In fact, that is what most studies in this area do, concentrating on personal characteristics (Falk & Adelman, 2003; Fienberg & Leinhardt, 2002; Storksdieck, 2006), social interactions

(Blud, 1990; Crowley & Callanan, 1998; Schauble et al., 2002), or the physical design of the environment (D. Anderson & Lucas, 1997; Falk et al., 1978; Silver, 2005). However, it is the interplay of these contexts that many contend to be the most enlightening and necessary aspect of studying learning in these environments (Falk & Dierking, 2000; Heimlich, 2005; Rennie & Johnston, 2004; Schauble et al., 1997). As such, multifaceted analysis is a necessary consequence given the complexities of these environments. Exploring ways to enhance the analysis process (e.g., three-dimensional representations of the data) would be a useful next step for research.

Data Collection

Exploring perceptions and learning in both the immediate and the long-term is important to get an understanding of the short- and long-term influence of an informal learning experience. There are however some potential disadvantages to this type of data collection. First, the act of interviewing participants immediately before the experience in order to get an idea of background interests and objectives may potentially influence how they subsequently view the experience, and this may further cue them for later interviews (Rennie & Johnston, 2004).

What data is collected is another consideration. While interview data is crucial to begin to understand the participants' experiences, supplementing this data with observations would give researchers a more complete view of the experience, particularly with regards to participants' interactions and conversations with other visitors and facilitators. Several methods have been documented in the literature for conducting observations. Museum studies have used audio recorders worn by participants as they moved through the exhibits (Abu-Shumays & Leinhardt, 2002; Fienberg & Leinhardt, 2002; Stainton, 2002). This method is often combined with a researcher who follows at a discrete distance, making note of the participants' actions and
locations, which are later matched up with the audio transcript. While these methods are certainly more costly than interviews alone, and there is the possibility that potential participants might be more reluctant to consent to that level of scrutiny, the information that might be gained from such methods could prove to be worth these risks.

Another risk in longer-term studies is the likely attrition of participants as time passes. Gathering complete contact data is essential, but even then there is the risk that participants will choose not to participate in any follow-up activities. Karthwohl (1998) points out that refusals are less common with personal interviews. Answering machines, caller ID, voice mail, and email inboxes, on the other hand, serve as screening agents for participants to choose whether or not to respond to a request. The question of course is why people choose not to participate when originally they had agreed, and what kind of data is missing from the findings because of their absence. Some suggestions for minimizing participant attrition includes offering incentives, and making several attempts to contact the person using a number of different means (e.g. telephone, email) (Karthwohl, 1998).

Additional Areas for Future Research

In addition to the previously described areas, another consideration for future research is to examine a more homogeneous group of participants based primarily on experience level. It could prove useful to gain a better understanding of why people who do not normally participate in informal learning environments chose to do so at this time, while continuing to use personal, sociocultural, and physical contexts to guide the investigation. Likewise, it could be beneficial to look at serial visitors to informal learning environments, again using context as a guide, to find out what makes them engage in such environments regularly.

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Much of the research in informal learning environments focus on family groups and parent-child interactions, and particularly how those interactions contribute to the child's learning (Falk & Dierking, 2000). While this study adds to the small amount of literature that focuses on adult interactions, further research is certainly called for in this area. The Information Age has brought the need for adults to learn new skills in order to continue to be productive citizens in our society. This movement has brought with it an increased recognition of the value of lifelong learning. It is increasingly unrealistic to expect to have an education, get a job, and to stay in that position doing the same things throughout a lifetime. Adults need to continue to learn in order to contribute to society not only in the workplace, but also in their home and community. Indeed, it is this arena of learning - beyond formal education - that makes up of the vast majority of learning in which adults engage (Falk & Dierking, 2002). As interest in informal learning continues to expand, more research is needed to understand how learning occurs and how best to support learning activities in these environments.

Conclusions

The purpose of this study was to explore the role of *personal, sociocultural,* and *physical* contexts on the short- and long-term experiences of adult participants in a natural, informal learning environment. In this chapter, I discussed the findings of this study in relation to the literature surrounding experiences and learning in informal learning environments.

The results of this study indicate that learning is a complicated process to examine, particularly when informal learning, by its very nature, happens outside of the constraints of typical learning objectives, being based instead on the motivations, interests, and goals of the learners themselves. Facilitators can play a big role, both in terms of enjoyment of the experience as well as learning outcomes. This study reinforced the idea that subsequent reinforcing

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experiences are necessary in order to continue to build upon knowledge gained from such an experience. Though there was little evidence of such reinforcing experiences for the participants in this study in the six months that followed, there is still the potential that these experiences can happen, even years later.

As Rennie and Johnston (2004) eloquently expressed, a visitor's experience in an informal learning environment is "like a tiny thread woven into the tapestry of the visitor's life experiences, linked directly or indirectly to all the other threads" (p. S13). The importance of this statement is twofold. First, it highlights the fact that often these experiences are but a temporary deviation from life's normal course, measured in minutes or hours. Just at important though is the fact that even these small threads have the potential to find relevancy in other areas of life and make an impact. It is the researcher's weighty task to try to help individuals find and identify these threads, and to follow the threads over time to see where they may lead.

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APPENDIX A: CODING SCHEME FROM PILOT STUDY

10000 Personal characteristics

- 10100 Level of Interest
- 10200 Expectations
- 10300 Learning styles/preferences

11000 Prior Whale watching

- 11100 Frequency/# of prior trips
- 11200 Expectations because of
- 11300 Memories/experiences from
- 11400 Comparisons to prior whale watches

12000 Impressions of the organization

- 12100 physical characteristics of boat
- 12200 staff/educators
- 12300 general conditions (weather, waves)

13000 Knowledge

- 13100 prior knowledge: content
 - 13110 whale characteristics
 - o 13120 whales/watches: general
- 13200 ways prior knowledge was gained
- 13700 general ways of gaining knowledge
- 13300 plans for gaining future knowledge
- 13600 failure to follow-through with

knowledge-gaining plans

- 13400 Gaining knowledge
 - o 13410 What you want to learn
 - 13420 How you plan to learn it
 - 13500 knowledge gained from trip
 - 13510 spatial understanding (proportion, size)
 - o 13520 feeding behaviors
 - o 13530 social behaviors
 - o 13540 behaviors, general
 - 13550 physical characteristics
 - o 13560 ocean environment

14000 Use of Knowledge/Experience

- 14100 plans for the classroom
- 14200 use in the classroom
- 14300 not really a fit for the classroom
- 14400 how attitude/enthus. effects students
- 14500 regrets about school constraints

15000 Response

- 15100 to sightings/whale activity
- 15200 ethical struggles
- 15300 environmental issues
- 15400 experience
 - o 15410 versus entertainment
 - o 15420 versus books/media
- 15500 regrets
- 15600 comparing to other exp (non w-w)
- 15700 speculations
- 15800 haven't thought about it much

16000 Emotions/affective reactions

- 16100 surprise
- 16200 joy
- 16300 confusion
- 16400 fun
- 16500 appreciation/satisfaction
- 16600 awe/wonder

17000 Sensory

- 17100 tactile
- 17200 olfactory
- 17300 visual
- 17400 auditory

18000 Social aspects

- 18100 interacting with strangers
- 18200 interacting with companions
- 18300 interacting with staff
- 18500 sharing experience w/ others after the trip

19000 Impact/behaviors

- 19100 paying attention to news
- 19300 changed perception
- 19400 changed behavior
- 19500 planning future trips

APPENDIX B: PHOTOGRAPHS FROM WHALE WATCHING BOAT



Note: Naturalist giving "dock talk" to passengers before trip. (Photo by Denise P. Domizi)



Note: View of top deck of boat (from bottom deck). In center is the naturalist with microphone. (Photo by Denise P. Domizi)

APPENDIX B: PHOTOGRAPHS FROM WHALE WATCHING BOAT (CONTINUED)



Note: View of top deck of boat. (Photo by Denise P. Domizi)



Note: View of inside galley area, with indoor seating and snack bar. (Photo by Denise P. Domizi)

APPENDIX B: PHOTOGRAPHS FROM WHALE WATCHING BOAT (CONTINUED)



Note: Educator talking with passengers about humpback whale flukes (tails) and their markings. (Photo by Lisa Ruffino)



Note: Educator showing passengers a plate of baleen from a humpback whale. (Photo by Lisa Ruffino)

APPENDIX B: PHOTOGRAPHS FROM WHALE WATCHING BOAT (CONTINUED)



Note: Humbpack whale lunge-feeding. (Photo by John Schell)



Note: Humpback whale in full breach. (Photo by John Schell)

APPENDIX C: PARTICIPANT CONSENT FORM

I agree to take part in a research study titled "Exploring short-term and long-term impacts of a whale watching tour on visitor learning, beliefs, and attitudes," which is being conducted by Denise P. Domizi, Department of Instructional Technology in the College of Education, (706) 549-1567 under the direction of Dr. John Schell, Department of Occupational Studies, (706) 542-1682. I understand that I do not have to take part in this study; I can stop taking part at any time without giving any reason, and without penalty. I can ask to have information related to me returned to me, removed from the research records, or destroyed.

The purpose of this study is to look at short-term and long-term learning as a result of a freechoice learning experience on a whale watching trip in New England.

If I volunteer to take part in this study, I agree to be interviewed briefly before the whale watching trip, and again upon returning to the harbor. I can expect the first interview to take about 5-10 minutes, and the second interview to take 10-15 minutes. I understand that I can elect to provide my contact information to the researchers if I agree to be contacted later if they have further questions.

Participants stand to gain from this study through self-examination of their own learning processes. No discomforts, stresses, or risks are expected from my participation in this study.

All information concerning me will be kept confidential. I have the right to review the audiotapes and transcripts, and understand that the researcher will erase the tapes once the research is complete, no later than July 2007. If information about me is published, it will be written in a way that I cannot be recognized. However, research records may be obtained by court order.

The researcher will answer any further questions about the research, now or during the course of the project, and can be reached by telephone at: (706) 549-1567.

My signature below indicates that the researchers have answered all of my questions to my satisfaction and that I consent to volunteer for this study. I have been given a copy of this form.

Researcher: Denise P. Domizi		<u></u>	
Telephone: 706-549-1567	Signature	Date	
Email: dpinette@uga.edu			
Name of Participant	Signature	Date	

Please sign both copies, keep one and return one to the researcher.

Additional questions or problems regarding your rights as a research participant should be addressed to the IRB chairperson in the Human Subjects Office at the University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411. Telephone: (706) 542-3199; E-Mail Address: IRB@uga.edu

APPENDIX D: PARTICIPANT INFORMATION FORM

Age:		Highest educational level attained:			
18-25	46 - 55	High school	Technical school		
26-35	56 - 65	Junior college	Graduate school		
36 - 45	over 66	College	Other		

Gender: _____Male____ Female

Estimated number of previous whale watching trips

How would you rate your interest in whales?

_____ very interested

_____ somewhat interested

_____ not very interested

How would you rate your knowledge about whales?

_____ very knowledgeable

_____ somewhat knowledgeable

_____ not very knowledgeable

With whom did you come on this trip?

_____I came alone

_____ I came with friends

I came with family

_____ Other _____

Would you be willing to be contacted in the future for some possible follow-up questions?

_____No Yes

If yes, please supply the following contact information:

Phone number:

Email: _____

Best time to be reached:

APPENDIX E: INTERVIEW PROTOCOLS

Open-ended Interview Protocols

Note: these questions will serve as a guide, but the protocol is open-ended by design in order to allow the researchers to explore the topic of visitors' learning based on their responses.

Interview 1 (Pre-tour interview)

- What made you decide to come on this trip today?
 - I will use probing questions to explore their interests, motivations, and prior knowledge and experience.
- What do you hope to get out of this experience (goals)?
- What are your expectations for the trip?
 - If these seem to be related to a previous trip, ask about that specific experience.

Interview 2 (Immediately following tour)

- What is your overall impression/reaction?
- What do you feel like you learned from this trip?
- Did you have any emotional reaction to your experience today?
- How important to you were each of the following often-cited reasons for coming on this trip: learning, entertainment, social "bonding."
- Tell me about your interactions with other people on the boat
 - Prompt: What about the people you came with? Other passengers? Educators? Naturalist?
- Where there things about the boat or the environment that impacted your experience?
 If asked to clarify, could mention weather, temperature, waves, etc.
- What were you expecting?
 - Did the trip meet your expectations?
 - Did anything unexpected happen?
- Is there anything you plan to do differently as a result of this experience?

Interview 3 (Follow-up interview by phone, 6 months later)

- Where do you live? How far did you travel to go on the whale watch?
- What was the purpose of your trip? (social, educational, entertainment?)
- What do you remember most from the trip?
 - Why do you think that particular memory sticks out for you?
- What were you expecting?
 - Did the trip meet your expectations?
 - Did anything unexpected happen?
- Do you think the day you had whale watching was probably a typical day whale watching?
- Has anything happened to you that has reminded you of the trip, or has made you think of it again?
- Thinking back, what would you say you learned from your trip?
- Do you think that being there influenced your learning?

APPENDIX E: INTERVIEW PROTOCOLS (CONTINUED)

- How was it different for you being there and experiencing it first-hand, rather than via a TV documentary, book, class, etc?
- Tell me about your interactions with other people on the boat
 - Prompts: the people you came with? Other passengers you didn't know? Educators? Naturalist?
 - Did you interact? Tell me about those interactions. Did they impact your experience?
- Have you talked about the trip with your trip companions since you got back? Have you told others about the trip?
 - What was the nature of the things you shared? (content, experience, etc.)
- Do you think that what you learned resulted more from your interactions with others, or that it was based more on your individual experience? (can be both)
- Did this experience prompt you to follow-up in seeking additional information on whales, environmental conservation in any way? Books, magazines, tv, aquarium trips, plans for future ww trips...
- Is there anything you are doing differently as a result of the whale watching experience?
 - Do you feel like you're paying more attention to news items or other information that may be related to whales or your experience on the boat?
- Is there anything I didn't ask that you think I should have, or anything else you'd like to add?

HUMPBACK WHALE Megaptera novaeangliae

From the Greek megas, for "large", pteron, for "wing" or "fin"

"New England" where they were first scientifically described



School bus = 40 ft.

Length: Adults 45-55 ft; Males, 49 ft, Females, 53 ft. Weight: Adults weigh between 25 and 40 tons At Birth: Length 14 ft., weight about 2 tons



Length: 88 ft. in the Southern Hemisphere and 79 ft. in the Northern Hemisphere Females are larger than males

Weight: Up to 70 tons, 2^{nd} in size only to the blue whale

At Birth: A calf is 20 ft. long at birth and weighs 1.9 tons

Why are humpback whales named?

When doing research, it's much easier to remember the name of a whale as opposed to a catalog number. There are 3 rules researcher follow when naming whales: No people names No gender-specific names. The name has to be based on a specific mark on the whale's tail.



Walrus is named for the walrus-like whiskers in the middle of his tail.



Anchor is named for the anchor-shaped mark on the left side of her tail.



Spoon is named for the spoon-shaped mark in the middle of her tail.

Over 1800 humpbacks have been named in the Gulf of Maine.

000	cc mary-patsy-sheryl.txt
Page Number 今 1 of 1 ⇔ Font Se	ettings
Env - Environment-weather Pers - learning	Mary One of the best parts of it was the storm. It's funny I was just saying that and the phone rings and he wants to know if we're alive. I'm here to have fun. I learned a lot, and nobody will believe me but I saw two whales off the side of the boat at one point, they didn't believe me but I did, and I never could see them other than that until the other time I saw them and I was right, and then I was the one that saw the one that was breaching, and then I got the NOAA one before you. So I'm very proud of myself. I learned a lot. Interviewer So any emotional reactions to the experience today?
Pers - reactions - positive	Mary Oh yeah, I did the happy dance because I was so happy when I saw the whales.
Pers - reactions - emotions	Sheryl And were definitely were having an emotional experience when the captain was telling us we must be imagining thing cause we were like, there it is! Right there. I think he was just kidding with us anyway.
FP - plans for behavior changes	Patsy The next time I go out, I'm not bringing the camera, because I just really want to see it. I got pictures in Alaska of the breaching, but not today. I don't know whether it was the waves, or the weather, or the cloudy day, or, I don't think any of them will come out.
W - social-watching	Sheryl I really kinda had fun watching what the other people were doing, too.
	Interviewer In what way?
	Sheryl Just you know, the kids enjoying something, or the parents missing it because they're making sure their kids aren't falling overboard.
	Mary Or making sure the baby is going to make it back to the cabin in gale force winds.
	Sheryl Hurricane force winds and they're trying to get back to the cabin.
Facil - educators-interns	Mary I also think there were two other people who were involved in who I got a huge There's a woman who works not with you guys but with the crew, but she had spoke with such passion about living here
Display Codes In Context	

APPENDIX G: EXCERPT OF CODED DATA

APPENDIX H: MASTER CODES WITH DESCRIPTORS

Code	Description
Pers – changes in behavior	learner interactions with educators docents guides
	etc. These interactions are usually informal in nature
Pers – communicating with	Participants communicating with the whales in some perceived
whales	manner
Pers – goals	What they hope to get out of the trip.
Pers – interest	How interested they are in whales, whale watches, ocean
	environment, etc.
Pers – learning	Discussion of things that were learned on the trip, with no real
	attribution to others (facilitated) - rather, by experience
Pers - occupation	Occupation of passenger
Pers – prior experience	Previous experience in the field with whales/whale watches
Pers – prior knowledge	Discussion of how something they learned on the trip either helped
	them understand something they already knew, or built on
	something they already knew.
Pers – reactions - emotions	Emotional reactions to the experience (or lack thereof)
Pers – reactions –	Expressions of frustration or disappointment in some aspect of the
frustration/disappointment	trip
Pers – reactions – guarded	Guarded reactions have a clause or gualification. Ex. We enjoyed it.
	but not as much as our last trip.
Pers – reactions – positive	Positive reaction to experience. May include descriptors such as:
1	enjoyable, fascinating, awesome, impressive, fun, exciting
Pers – reasons for coming	Why participants say they came on the trip that day.
Pers – expectations	Describes what passengers expect from the trip, and whether the
-	trip met their expectations (see: "Pers – reactions" to compare
	if/how expectations were met)
Pers – remember most	What participants say they remembered most from the trip
Pers – whale	Talk about emotions and thoughts that the whales might be (or
emotions/thoughts	might not be) having
W – social interacting –	Conversations, exchanges, and interactions between the members
within group	of any social group/community (non-facilitated)
W – social - watching	Watching other members of the community, though not interacting.
Facil – education	Focus more on the learning objects and facilitated education
	(delivered to the passenger)
Facil – educators/interns	learner interactions with educators, docents, guides,
	etc. These interactions are usually informal in nature
Facil – naturalist	Interactions are more formal – for the most part, she presents
	information over PA but does not interact with participants as the
	educators/interns do
Env – boat	Discussion of or mention of the boat itself - amenities, problems,
	etc.
Env – weather	Any discussion of or mention of the weather.

Code	Description
Env – lived experience	Being there in the natural setting (may be juxtaposed with
	comparisons of TV, aquariums, etc.)
Env – whale behaviors	The whales themselves and their behaviors (as one aspect of the
	physical environment)
FP –behavioral changes or	What passengers said they would do or think differently as a result
action	of this trip, or changes they had made as a result
FP – sharing experience	Telling others about the experience
with others	
FP – trips	Planning future trips, could be with others, but not necessarily
FP – educational	Plans to follow-up or learn more about something that they were
	exposed to on the trip
FP – general	General future plans
FP – increased interest	Demonstration or intent to have more interest in something that
	they were exposed to during the trip (environmental issues, whales,
	etc.)

APPENDIX H: MASTER CODES WITH DESCRIPTORS (CONTINUED)

Note: Pers = Personal Context; W = interactions within group; F = facilitated interactions; Env = physical context; FP = Future plans

APPENDIX I: CROSS-CASE CODE REPORT FROM SAMPLE CODE

Env - value of lived experience

Source Material:

Jay You can go see pretty much any animal you want at a zoo or a, but a whale, it's big, this beats a zoo I'd say. *Interviewer* Why do you think? *Jay* It's just more impressive, it really is. I mean, in a zoo, yeah, you have cool animals but they're all in cages, but out here, this is where they live. This is where it is. This is the only place you can really see them. I think that's a lot more impressive than anything.

Env - value of lived experience

Source Material:

Max I've seen documentaries about marine animal behavior and they talk about the bubble nets, and how they'll trap fish like that and I've never seen that actually take place but that was really cool to watch them actually create the nets there and then scoop up all the fish or the eels. That was really interesting to see firsthand after hearing about it and I've read about it, so that was pretty neat to see how they actually do it.

Env - value of lived experience

Source Material:

Max I learned a lot just by watching them, just by seeing their actual behavior. It's one thing to read it in books or hear someone else lecture and talk about it but it's another to actually be there and experience it. *Rita* Yeah, I think it was just, you know like Max said, it's one thing to see it on television or see photos, and even listen to other people. It's another thing when you see it in person and actually get to be there and be as close as you can, you know sort of humanly get was really just neat to see them just being whales. [laughing]

Env - value of lived experience

Source Material:

Max Oh just, like I said you can read books and go to lectures but you don't get the same thing as actually seeing it for yourself. I found it much more interesting to sit here and watch the whales do it themselves than hear somebody, than to just listen to the captain talk about it for an hour. I wouldn't have gotten the same thing as actually sitting here watching it, which was great.

Env - value of lived experience

Source Material:

Rita Well just that it's something they should do. I mean, I think anybody that has any remote interest in the ocean, or animals in general would enjoy doing this because it's such, it is such a different experience actually being out here then watching it sort of passively on a television or in a movie, as great as movies can be.

Env - value of lived experience

Source Material:

Walt I'm not sure that I necessarily learn something on every trip, or if it's that every trip is different. The experience is different, and you know I guess if you learn from the experience then that's something.

APPENDIX J: IRB APPROVAL FORM



Office of The Vice President for Research DHHS Assurance ID No. : FWA00003901

APPROVAL OF RENEWALS / CHANGES

Request Date: 2006-06-13

Project Number: 2005-10728-1

Name	Title	Dept/Phone	Address	Email
Dr. John W. Schell	PI	Occupational Studies Rivers Crossing +4809 542-4206		jschell@uga.edu
Ms. Denise Pinette Domizi	со	Instructional Technology Aderhold Hall +7144 (706) 549-1567		dpinette@uga.edu

Title of Study: Exploring short- and long-term impacts of a whale watching tour on visitor learning, beliefs, and attitudes

45 CFR 46 Category: Continuing Review Renew : No Parameters: APPROVAL OF ABOVE NOTED CHANGES.

Change(s) : Revised Consent Document(s); Revised Procedures; Revised instrument(s);

Approved : 2006-06-27 Begin date : 2006-06-27 Expiration date : 2010-08-03

NOTE: Any research conducted before the approval date or after the end data collection date shown above is not covered by IRB approval, and cannot be retroactively approved.

Number Assigned by Sponsored Programs:

Funding Agency:

Form 310 Provided: No

Your request for approval of renewal and/or changes has been approved.

You must report any adverse events or unanticipated risk to the IRB within 24 to 72 hours. Refer to the IRB staid-dines for additional information.

Use the attached Researcher Request Form for requesting renewals, changes, or closures. Keep this original approval form for your records.

> Chairperson or Designee, Institutional Review Board

Institutional Review Board Human Subjects Office 612 Boyd GSRC Athens, Georgia 30602-7411 (706) 542-3199 Fax: (706) 542-5638 www.ovpr.uga.edu/hso