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Learning from Museums: An Introduction

The idea that knowledge is essentially book learning seems to be a very modern view, probably derived from the mediaeval distinctions between clerk and layman, with additional emphasis provided by the literary character of the rather fantastic humanism of the sixteenth century. The original and natural idea of knowledge is that of "cunning" or the possession of wits. Odysseus is the original type of thinker, a man of many ideas who could overcome the Cyclops and achieve a significant triumph of mind over matter. Knowledge is thus a capacity for overcoming the difficulties of life and achieving success in this world.

—G. S. Brett, *Psychology Ancient and Modern*

Beware stories that dissolve all complexity.

—David Shenk, *Data Smog*

As America and the rest of the world transition from an industrial to a knowledge-based economy, knowledge and meaning-making more than ever before become key to social and economic well-being. Even though the quantity of information grows exponentially all around us, our thirst for knowledge, for meaning-making, remains unsatisfied. Much as an individual on a life raft in the middle of the ocean says, "Water, water everywhere, but not a drop to drink," so too do we find it difficult to become "knowledgeable and satisfied meaning-makers" despite a glut of information. Where can a knowledge-thirsty public turn for learning? There are books. Despite the hype about declining literacy, the number of books sold per year is at an all-time high.¹ There is television. Not only is

television viewing up,² but so too is the amount and diversity of information-oriented programming.³ There is the staggering growth of the Internet, a fact of which we are all aware.⁴ And, yes, there are museums!

Museums—art, history, natural history, and science museums; zoos and aquariums; botanical gardens and arboretums; and historical sites—are tried-and-true sources of understandable information, places one can trust to provide reliable, authentic, and comprehensible presentations of art, history, natural history, and science objects and ideas.⁵ They are places that both children and adults can leisurely browse to discover the past, present, and future of humanity, the natural world, and the cosmos, where the public can seek and find meaning and connection.⁶ In large part as a result of this classic convergence between ever rising popular demand (the public's desire for knowledge and meaning-making), and a reliable and trusted supplier (institutions capable of presenting ideas to the public in enjoyable and comprehensible experiential formats), museums of all types have been enjoying unprecedented popularity and growth.⁷

Let us put these changes in perspective. Thirty years ago only about one in ten Americans went to museums with any regularity. Ten to fifteen years ago that number had increased to nearly one in four. Today, depending upon which statistic you believe, somewhere between two and three out of every five Americans visit a museum at least once a year.⁸ This number is likely to continue to increase so that, if not already, soon the majority of Americans will visit some kind of museum at least once a year.⁹ Although museums have clearly changed what and how they present objects, ideas, and information, as well as the types of exhibitions and programs they present, the change has not been so dramatic as to totally explain this explosion in popularity. This change suggests a fundamental shift in the public's values and priorities relative to museums, a change in the public's perceptions of the role museums can play in their lives. Whereas as recently as twenty years ago museums were widely considered dusty anachronisms, today they enjoy a high level of public awareness and prestige. It was not so long ago that the vast majority of Americans would rather have been bound and gagged than visit a museum. Today museums rank along with shopping and sports as one of the most popular out-of-home leisure experiences in America.¹⁰ Doubtless, the causes for this sudden shift in appreciation and popularity in museums are many, but we would argue that at the core there is but one thing—learning. Learning is the reason people go to museums, and learning is the primary “good” that visitors to museums derive from their experience. In large part responding to both of these realities, the museum com-

munity currently justifies and boldly promotes itself as a bedrock member of the learning community.¹¹ Yet many inside and outside the museum community privately, and sometimes publicly, question whether any real learning occurs in museums. Do visitors to museums learn, and if so, how do they learn and what do they learn? This book intends to answer these questions. However, as we will soon make clear, the answers are neither simple nor easily investigated. Unlike only a few short years ago, though, they are now answerable.

LOOKING AT SOME OF THE DATA

The place to start, or so it would seem, is with the museum experience itself, where the proverbial rubber meets the road: the exhibition or program. The prevailing model for understanding learning in museums runs something like the following: *Visitors come to museums, look at exhibitions, or participate in programs, and if the exhibitions or programs are good, the visitors learn what the project team intended.* This seems simple enough. You create a quality educational exhibition or experience, add visitors, and, voila, you get learning! Informed project teams have even expanded their notions of learning to include a host of previously excluded dimensions, including changes in attitudes, aesthetic appreciation, and family communication, to name a few. But is it that simple? Let's follow two visitors whom we observed as part of a research effort at the Smithsonian's National Museum of Natural History explicitly designed to test our assumptions about museum-based learning and see whether this traditional model seems to explain what is going on.¹²

Two women in their late twenties enter the Museum of Natural History on a Sunday morning in early fall. They begin by walking up to the elephant in the rotunda. After a brief pause there, they obtain a map at the information desk and head for the dinosaur and paleontology exhibitions. They quickly make their way around the dinosaur exhibitions, stopping occasionally to read a few labels here and there. For example, one of them seems particularly interested in the head of the *Triceratops*. After about ten minutes they exit again by way of the rotunda and, checking their maps, head down the escalator to a temporary exhibition on spiders. They spend about fifteen minutes in *Spiders*. Sometimes they watch other groups interacting with exhibits, and sometimes they interact with exhibits themselves. Most of the time, the two women stay together and look at the same exhibits; occasionally they drift apart and look at exhibits separately. Next they go back up the escalator and walk through the other

temporary exhibition at the museum, *Ocean Planet*. This exhibition they view at about the same pace as *Spiders*; total time in the exhibition is also about fifteen minutes. Next they briskly walk through the various vertebrate exhibits on birds, mammals, and amphibians, briefly pausing at a few scattered exhibits but never for more than a few seconds. They take the elevator up to the second floor and very quickly walk through the *Geology, Gems and Minerals*, and *Insect Zoo* exhibitions. Ninety minutes after entering the museum, they are ready to leave.

Before they leave, we conduct an open-ended interview, inquiring about why they had visited, what they had discovered that was new to them, what they had found interesting, and a whole series of other questions designed to understand their personal experience within the museum. One of the women chooses to talk about the *Spiders* exhibition and the *Insect Zoo*. She says the *Insect Zoo* was her favorite exhibition area. When asked why, she says, "Just because of the way it was set up. There was a lot of interactive stuff, and I liked how the designs kind of incorporated the walls . . . and cages." The other woman says her favorite exhibit was *Ocean Planet*; however, she finds it difficult to give a specific reason other than saying, "Conserving the ocean is important." When questioned further, each is able to give one or two specific examples of new tidbits of information they learned. For example, one comments on how surprised she was at the diversity of spiders and how interesting some of their webs were. She also volunteers a comment on the dinosaur exhibition, saying she had learned about the shapes of some of the aquatic dinosaurs. When probed about the *Triceratops*, she says she really found the size of it remarkable. The other woman mentions that she enjoyed all the exhibitions and thought that the quality of the displays was quite good. Other than these few comments, neither woman has too much to report. The only mention made of any of the exhibitions seen in the last half of their visit, the period when they were "skating" through the museum, was the one woman's comments about the design quality of the *Insect Zoo*.

So, what did these women learn? If you are an optimist, you might conclude that they clearly came away with a greater appreciation of spiders, their variety and adaptability (although they didn't exactly say this, it could be inferred); at least one also seemed to have a richer sense of the size and diversity of dinosaurs. Also, one of the women seemed to have her commitment to ocean conservation reinforced. If a pessimist, you would be justified in concluding that these two women learned precious little in their ninety-minute visit.

However, this is not the end of the story. Five months later we telephoned each of these two women, and among other things, we asked

them if they had thought about their trip to the National Museum of Natural History at all since their visit. We asked whether they had discussed their visit with anyone or whether any event had made them aware of something they had seen or done while at the museum. One of the women said that the part of her Washington trip she mentioned to her family was the time she spent in the museums, "because we spent most of our time there." She was bubbling over with enthusiasm about her trip, in general, and her visit to the Museum of Natural History, in particular. She mostly described the *Spiders* exhibition and the *Insect Zoo* and its impressive design. She reiterated what she had said immediately after her visit, that the *Insect Zoo* had really good displays and interactives for kids and adults and was colorful and interesting. In detail, she went on to describe several of the exhibits in both the *Spiders* and *Insect Zoo* areas, recalling what they looked like, how she interacted with them, and what she remembered about their messages. She described in much more detail than immediately after her visit ideas and facts she learned. For example, she said that since seeing the *Spiders* exhibit, she was more aware of the types of spiders that live in her community, such as the brown recluse. She said she had never realized that there were poisonous spiders living in her hometown. As she thought about it more, she said she thought she might have mentioned to someone that there are poisonous spiders in her community, but she was not sure. This latter recollection came up in conversation when she noted that she was currently working on editing a new textbook (she works as a school textbook editor) that included chapters on insects and spiders. She said that she found her natural history museum experience useful for this chapter and that it may have been in the context of that project that she mentioned what she learned to a coworker.

She also remembered telling her parents about the architecture of the building, because it was so distinctive. She was particularly struck by the size of the dome and the impressive inlays on the floor and ceiling. She also recalled telling her family that she thought the animals and dinosaurs were more interesting than the gems. She could not remember if she mentioned the Museum of Natural History specifically to anyone after her visit, just the Smithsonian museums, in general. She said she talked to people a lot about the Holocaust Museum, primarily because it was new: "It was the highlight . . . I mean, not the highlight [in terms of it being uplifting], but . . . [a highlight in terms of it having made the strongest impact on me]." She found it to be depressing, but interesting and well done.¹³

As she talked more about the National Museum of Natural History, she said she remembered the elephant at the entrance to the museum and that

it reminded her of the elephants at the Field Museum of Natural History in Chicago, where she lives. She wondered whether all natural history museums have elephants in the entrance.

Then she launched into another story she felt related to her trip to the museum. She indicated that when she went to visit her parents, who had recently moved to Michigan, she had seen black squirrels there. When she saw them, she said, she remembered having seen an exhibit about albinism and melanism in squirrels at the Museum of Natural History.¹⁴ She said she remembered wondering whether the Michigan squirrels were an example of melanism but said she was not sure that they really were.¹⁵ She concluded by saying she had been to the museum before, so she knew it would be interesting. Since she is “into science,” she wanted to see what was new at the museum since her last visit and so was particularly interested in new aspects of the museum, such as the *Spiders* and *Insect Zoo* exhibitions.

In contrast to the first, the second woman said that she had visited many museums and learned a lot, but nothing stood out in her mind several months later specifically about the Museum of Natural History. She could remember a few assorted details about the museum—for example, that she saw an exhibition on spiders, that her friend was really excited about the *Insect Zoo*, and that generally she saw lots and lots of rocks and bones.

The only exception to her general lack of recall related to a book she was reading. She said she was reminded recently of the Museum of Natural History when reading a popular novel about amphibians (Tom Robbins’s *Asleep in Frog Pajamas*). She said the book reminded her of just how many different types of amphibians she had seen at the museum. She went on to say, “Having seen the Natural History Museum’s habitats and reconstructed [amphibian] environments made the book easier to picture—it is about the fictional lifestyle of amphibians.”¹⁶ She said that although she is trained in art, “I enjoyed [the Museum of Natural History] anyway. . . . I liked the variety of the trip.”

The second woman went on to describe how she and her friend had also visited art museums during their visit, for example, the National Gallery of Art, which she said she enjoyed more than the Museum of Natural History. She proceeded to describe a number of the paintings she had seen, discussing some of her favorite pieces of art and artists at length (e.g., Picasso, Braque, and Cézanne). She said she enjoyed the exhibitions she saw at the natural history museum because they “reinforced her knowledge.” But she said that while she was not sure she learned that much new, it was wonderful to see things that made “real for her” things

she already knew. She compared the museum to watching TV nature shows, which she said she does often. She said the museum’s exhibitions and TV nature shows are similar in that they “look at one species in depth and allow you to put an image with an idea.”

MAKING SENSE OF THE DATA

What an amazing difference! Five months later both women seemed to have constructed additional knowledge about the experience, despite initial appearances. In particular, one of the women seemed to have come away with several new insights, a number of new ideas, and an overall renewed excitement and interest in natural history. Although her friend seemed to have found less to connect with, at least at this museum—obviously her personal interests lay in art—she too came away with a few new tools for visualizing and making more comprehensible the natural world around her. All in all, not bad for a quick ninety-minute spin through the museum! But this is not all we can learn from this example.

Equally important, and perhaps most startling, is the fact that these demographically nearly identical individuals (well-educated, professional—both children’s textbook editors—white women in their late twenties living in the same Chicago community) visited the same museum on the same day, saw the same exhibitions for exactly the same amount of time, even viewed and discussed with each other some of the same specific exhibit elements, and yet what they learned was totally different. How can this be? Certainly these data throw into question our initial museum learning model that posited that if visitors look at exhibitions or participate in programs, and if the exhibitions or programs are good, they will learn what the exhibition team intended. These data would suggest that the model, if not completely wrong, at the very least is seriously flawed. Understanding the content and quality of exhibitions and programs is necessary but not sufficient for understanding the complexity of museum learning.

As we look at the data gathered during the follow-up interview, we begin to see the important roles played by prior knowledge, interest, and the museum experience itself, as well as the unpredictable but important role of subsequent experiences, such as later seeing a black squirrel in Michigan. All these variables played major roles in affecting what these women were able to remember and what they ultimately learned. The truth of the matter is that if we had known beforehand that one of these women was a self-described “science person” and the other

an “art person,” we might have better been able to predict that they would have focused on different aspects of the experience. If we had known that one of the women was a children’s science textbook editor and the other a children’s art textbook editor, we would have understood why they focused on different features of the museum. If we had known that this was not the first visit for one of the women but was for the other, we might have understood why they spent their time as they did. If we had known more about how this particular museum visit fit within these two women’s visit to Washington, we might have better understood why they spent such a relatively small amount of time at the museum. If we had known that one of the women was only visiting this museum in deference to her friend but that shortly the roles would be reversed when they visited the National Gallery of Art, we would have better understood the differences in time, attention, and meaning-making invested in the museum by the two. Finally, we could not have known beforehand what events would transpire after the visit, but certainly we could have predicted that events would transpire and that these events would play a powerful role in what subsequently was remembered from the experience.

In short, in order to understand what these two women learned at the National Museum of Natural History on this particular Sunday morning required knowing much more about them and their visit than merely what exhibitions they visited and for how long. To the extent that we can generalize from this one example, learning from museums involves a wide variety of variables, some of which relate to the exhibitions and programs and many that do not. Why visitors come, with whom they visit and for what reasons, what they already know, what their interests are, what their prior museum experiences are, and what subsequent reinforcing events occur in their lives play as great a role in learning—if not a greater one—as anything that happens inside the museum.

At this point it is probably important to reiterate that this is real data, albeit on just two individuals from a larger study of fifty visitors. However, we are quite certain that the results would not change dramatically if we repeated this experiment with the same individuals in a different museum (for example, if we had compared these women’s learning at the National Gallery of Art or the U.S. Holocaust Memorial Museum), nor would results be different with other pairs of individuals at the same museum. In fact, we have done this experiment, as have others, directly and indirectly, with hundreds if not thousands of individuals. The same thing happens. It is not that these two individuals were oddities, it is that our traditional model of learning is flawed.

Yes, people learn in museums, but over the years providing compelling evidence for museum-based learning has proved challenging. As it turns out, this is not because the evidence did not exist but because museum learning researchers and the public alike have had the wrong search image and were using flawed tools. There are many reasons for this, but the primary reason has been the strange and fundamentally erroneous way that learning has been traditionally conceptualized. Perhaps the greatest impediment to understanding the learning that occurs in museums has been that social scientists, educators, museum professionals, and the public at large have historically thought of museum learning as being similar to traditional models of learning, such as the transmission-absorption model.¹⁷ This line of thinking suggests that museum visitors should learn the same types of things and in the same manner as do students at school; the only major difference is that in museums people learn less. The standard museum learning paradigm described above is a good example of this; the visitors are the students and the exhibition is the lesson. Bring the students into the classroom, present them with a lesson, and they will learn it. In the case of the classroom, they will have plenty of time to absorb it all; in the case of the museum, they spend less time, so maybe they will only get the gist of the message. As we have seen, this model does not quite work in museums—and, of course, in truth, it does not quite work in schools either.

Defining learning is a tricky business. For example, learning is simultaneously a process and a product, a verb and a noun.¹⁸ So slippery is learning as a concept that even the social scientists that study learning for a living, such as psychologists, anthropologists, and sociologists, have difficulty agreeing on a single definition.¹⁹ Many of these professionals have avoided the dilemma by identifying numerous types of learning. For example, it has been argued that there is one type of learning that occurs when remembering sensory experiences and another type of *higher* learning that occurs under conditions of instruction such as might occur in a school classroom.²⁰ Although one could find merit in such taxonomies for some purposes, for the purposes of understanding museum learning, they certainly have little value. It is better to think more holistically, to think about learning as a series of related and overlapping processes, appreciating that such systems can be difficult to make sense of because of their complexity and ephemeral nature. By analogy, it is traditional to discuss the complex and ephemeral functioning of the human body by thinking of the circulatory, respiratory, and nervous systems as separable and discrete entities. This approach has many benefits, particularly if one does not lose sight of the fact that in a fully functioning, living human,

none of these complex systems is in fact separate or discrete, nor can their individual functions be completely isolated without damaging the whole. To understand the living system, it ultimately makes more sense to talk about respiration or digestion, activities that involve many of these systems simultaneously. Similarly, there are benefits to a reductionist view of learning, as long as it is ultimately appreciated that learning in museums is a whole-body, whole-experience, whole-brain activity.

THE CONTEXTUAL MODEL OF LEARNING

To this end, eight years ago we formulated a framework for thinking about learning that tried to accommodate much of the diversity and complexity surrounding learning, a framework that we called the Interactive Experience Model.²¹ Today we have built upon and refined that model, recasting it as the *Contextual Model of Learning*. The Contextual Model posits that all learning is situated within a series of contexts. In other words, learning is not some abstract experience that can be isolated in a test tube or laboratory but an organic, integrated experience that happens in the real world. We argue that learning is a product of millions of years of evolution, an adaptation that permits an ongoing dialogue between the whole individual and the physical and sociocultural world he or she inhabits. The Contextual Model was derived from observations of real people in real settings, and thus it is not surprising that other thoughtful individuals, before and since, also considered models similar to this one.²² The Contextual Model involves three overlapping contexts: the *personal*, the *sociocultural*, and the *physical*. Learning is the process/product of the interactions between these three contexts. Intentionally, this model of learning is more descriptive than predictive. The power of the Contextual Model is not that it attempts to reduce complexity to one or two simple rules but rather that it embraces and organizes complexity into a manageable and comprehensible whole. In so doing, the Contextual Model successfully accommodates much, if not most, of what is currently known about learning.

After working with this model for nearly a decade, we believe it is still reasonable but, as initially described, incomplete. Over the intervening years we have come to appreciate that the model needs a fourth dimension—*time*. Looking at the museum experience as a snapshot in time, even a very long snapshot (e.g., the time a visitor spends in the museum), is woefully inadequate. To understand learning, any learning, requires a longer view. It is as if you need to pan the camera back in time and space

so that you can see individual learners across a larger swath of their life and can view the museum within the larger context of the community and society.

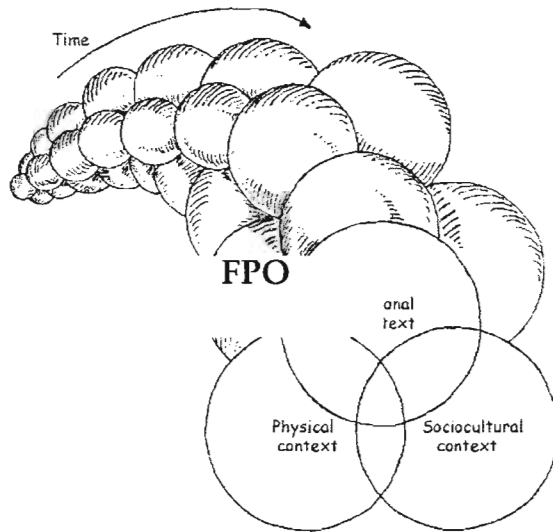
A convenient, though admittedly artificial, way to think about this model is to consider learning as being constructed over time as the individual moves through his sociocultural and physical world; over time, meaning is built up, layer upon layer. However, even this model does not quite capture the true dynamism of the process, since even the layers themselves, once created, are not static or necessarily even permanent. All the layers, particularly the earliest ones, interact and directly influence the shape and form of future layers; the learner both forms and is formed by his environment. For convenience, we have distinguished three separate contexts, but it is important to keep in mind that these contexts are not really separate, or even separable.

Western science in general and psychology in particular are strongly tied to ideas of permanence—the brain is a constant, the environment is a given, memories are permanent. None of this appears to be, in fact, reality. None of the three contexts—personal, sociocultural, or physical—is ever stable or constant. Learning, as well as its constituent pieces, is ephemeral, always changing. Ultimately, then, learning can be viewed as the never-ending integration and interaction of these three contexts over time in order to make meaning. Perhaps the best way to think of it is to view the personal context as moving through time; as it travels, it is constantly shaped and reshaped as it experiences events within the physical context, all of which are mediated by and through the sociocultural context. A valiant effort at depicting this model is shown in figure 1.1. This model really should be depicted in three dimensions and animated, so that both the temporal and the interactive nature of learning could be captured. In the absence of 3D animation, we invite you to use your imagination.

DOCUMENTING LEARNING

It is essential to document the learning that results from museum experiences. We believe that educators and psychologists, as well as policy-makers and the public, have historically found this a challenging task because they have approached the problem incorrectly, quite literally asking a fundamentally flawed question. In museums and schools alike, we have framed the question as, What does an individual learn as a consequence of visiting this museum, or seeing this exhibition, or attending

Figure 1.1 The Contextual Model of Learning



this lecture? The better, more realistic question is, How does this museum, exhibition, or lecture contribute to what someone knows, believes, feels, or is capable of doing? All learning is a cumulative, long-term process, a process of making meaning and finding connections. All educational institutions exist within a larger educational infrastructure. What we know about any particular topic is the accumulated understanding constructed from a wide variety of sources, typically including school; newspapers and magazines; books; conversations with friends, family, and knowledgeable acquaintances; television shows; films; observations in the world; and, often, museums. People do not learn things in one moment in time, but over time. Since we have framed the problem inappropriately, we have set out inappropriately to document it. And perhaps more profoundly, since we have framed the problem inappropriately, we have set out inappropriately to achieve our goals as well. Thus you can neither expect to share knowledge or beliefs or feelings or capabilities in one moment in time, nor can you expect to be able to document that knowledge, belief, feeling, or capability as if it were constructed in one moment in time. The net effect of this faulty model has been poor practice and poor documentation.

Thus, the learning model we need, the learning model we will attempt to develop in this book, is a contextual model that includes a time dimension. We will use the museum as a case study, as an example of how peo-

ple learn when they freely choose to learn. Free-choice learning tends to be nonlinear, 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. This type of free-choice learning is not restricted to museums, but it is in museums that we currently best understand it. To the extent we can develop a better model of learning in museums, we, as a community, can do a better job of facilitating learning in museums and other free-choice learning settings, and a better model will also enable us to do a better job of documenting the learning that results.

The questions that many museum directors, trustees, and professionals are currently asking are, Do people actually learn as a result of museum experiences? And if so, what are they learning? We would assert that the answer to the first question is an unequivocal yes. Answering the second question is much more difficult since it requires knowing something about who is visiting, why they are visiting and with whom, what they are doing before and after the visit, what they see and do in the museum, and how all these factors interact and interrelate. The place to begin this investigation is with the fundamentals of how people learn, through an inquiry into the roles of the personal, sociocultural, and physical contexts and how these contexts interact over time and space to affect learning.

KEY POINTS

- Free-choice learning occurs during visits to museums, when watching television, reading a newspaper, talking with friends, attending a play, or surfing the Internet. Free-choice learning tends to be nonlinear and personally motivated and to involve considerable choice on the part of the learner as to when, where, and what to learn.
- To understand human learning, it is important to appreciate that it is the product of hundreds of millions of years of survival-oriented evolution, an adaptation enabling people to intelligently navigate an ever changing social, cultural, and physical world.
- One of the aspects of learning that makes it so challenging to understand is that it is always both a process and a product, a verb and a noun.
- The *Contextual Model of Learning* suggests that learning is influenced by three overlapping contexts: the *personal*, the *sociocultural*, and the *physical*. Learning can be conceptualized as the integration and interaction of these three contexts.

NOTES

1. Achenbach 1999; U.S. Bureau of the Census 1996.
2. Godbey in press; U.S. Bureau of the Census 1996.
3. Gross 1997.
4. Achenbach 1999; Schwartz 1998.
5. Pitman 1999.
6. Pitman 1999.
7. Lusaka and Strand 1998.
8. Cf. Lusaka and Strand 1998; Falk 1998.
9. Falk 1998; Association of Science-Technology Centers 1998.
10. Falk 1998; Association of Science-Technology Centers 1998.
11. American Association of Museums 1992.
12. This excerpt describes the museum experience and subsequent interviews with two people who were part of a larger study of fifty visitors conducted at the National Museum of Natural History in 1994 (Falk et al. n.d.) The following methodology was employed: (1) Randomly identify individuals, either in a group or alone, as they enter the museum. (2) Conduct a brief introductory interview to know more about who the visitors are, where they come from, why they are visiting, and what they hope to see and discover. (3) After securing permission, track the visitors as unobtrusively as possible throughout their entire museum visit (including stops at the gift shop, food service, etc.), noting where they go, what they do, and, to the extent possible, what they converse about. (4) Conduct an open-ended, face-to-face postvisit interview that seeks to learn why they visited the museum, what they were interested in, and what they felt was interesting and informative during their visit. (5) Four to five months later, call individuals back and reinterview.
13. We did not pursue in any detail her memories of the Holocaust Museum or, subsequently, her friend's memories of the National Gallery of Art.
14. This exhibit is located in the mammal exhibition hall, which is currently being redesigned, one of the areas this woman zipped through in the latter half of her visit. Note: Albinism is an absence of pigmentation that causes an animal to appear white; melanism is an abundance of pigmentation that causes an animal to appear black.
15. She was correct in thinking the black squirrels she saw were an example of animal melanism.
16. The exhibit she referred to could have been located in either the vertebrate exhibition hall or the *Insect Zoo*; both of these were areas this woman zipped through in the latter half of her visit.
17. Hein 1998; Hein and Alexander 1998.
18. Falk and Dierking 1995.
19. Bransford 1979.
20. Churchland 1986.
21. Falk and Dierking 1992.
22. See, e.g., Lewin 1951; Ceci and Roazzi 1994; Mead 1934; Shweder 1990.

2



The Personal Context

The history of educational theory is marked by opposition between the idea that [learning] is development from within and that it is formation from without.

—John Dewey, *Experience and Education*

Learning is a very personal experience that depends on a number of conditions for success, some within the brain and others more a function of the external environment. This reality is well illustrated by a letter written to us in 1995 by a colleague, Edward Jay Pershey, Director of Education at the Western Reserve Historical Society, Cleveland, Ohio.

I was attending the American Association of Museums' Learning in Museums seminar in Chicago in November, 1994. During the day-long seminar the first day, a portion of the discussion centered around the idea that it is difficult to measure just what people learn while visiting the museum, since the learning is informal to begin with and may not manifest itself for some time, sometimes years. . . .

That evening I called back to my wife Monica Gordon Pershey, who is an Assistant Professor of Speech & Hearing at Cleveland State University. Her areas of interest are language and reading development in children. She started off telling me how her day went. That morning she had an appointment at a school on Cleveland's West Side. Cleveland State and our neighborhood are on the East Side. [Cleveland's East Side and West Side are divided by the Cuyahoga River, which runs through the industrial Flats and marks the west border for downtown.] When she went to go over to the West Side, she remembered that the high level bridge crossing the Cuyahoga Valley was under repair and closed, and so she chose to follow a route through the Flats that I had showed her a few weeks before. There are several smaller bridges, lift and swing bridges, at river level that she could cross.