

Leinhardt, G., & Knutson, K. (2004). *Listening in on museum conversations*. Walnut Creek, CA: AltaMira Press.



Actually, we went the wrong way.

Did we really?

Oh, nice going, Mom.

Because here's the progression from the buggies, the horseless carriages, and then down and around kind of.

Okay. Why don't we look at these while we are over here in this section? It doesn't really matter anymore since we messed up.

—VISITOR CONVERSATION FROM THE *AUTOMOBILE IN AMERICAN LIFE* EXHIBITION

Problem

THE PREVIOUS CHAPTERS EXAMINED the identity features (motivation and prior knowledge) that visiting groups brought to the exhibition and used during their visit as well as the conversational elaboration that occurred when visiting groups, with their shared identities, encountered the content of a particular exhibition. This chapter explores the exhibition itself and what the curators and design teams brought to the exhibition. Exhibitions are carefully crafted not only to highlight and display artifacts of value but also to provide and support learning about them. The challenge here is how to capture the elements of design in a grounded enough fashion to reflect the actual distinctive qualities of each exhibition, while also providing for a process of generalized cross-platform description. Unlike other museum research that takes place in a single museum or exhibition, this work was explicitly designed to examine learning across multiple and very distinct environments. Internally, for the MLC team, this created no small problem. In educational research enormous effort has been spent over the last decade to point out the

profound differences in learning that exist among subject matter areas. Research has shown, for example, that a good question is not a good question independent of the subject matter under consideration.¹ Therefore, developing principled ways to discuss learning across extraordinarily diverse museum environments was challenging. How could the unique features of each exhibition (walking through a slave ship, watching explanatory videos, constructing one's own animation) be preserved, while still generalizing across them? How could we analyze, in comparable ways, displays that explicitly explain the processes and concepts of film production and editing and displays that implicitly connect objects of art and science through groupings and thematic links? The great concern in developing a cross-site analytic framework for examining the learning environment was that we might unintentionally seem to say: "hands-on manipulatives are good (or bad) and lead to learning (or not)," when in some environments this statement entirely misses the point of the unique experience offered.

The question of how to effectively examine the learning environment of a museum or exhibition remains problematic. The arrangement of objects, text, and hands-on elements within an exhibition space is conceptually designed with the layers of design, making it difficult to tease apart specific factors of the environment that affect learning. "Are visitors aware of the thematic subtext of wall color change, or does it go unnoticed?" "Do visitors read the labels or just notice the wall titles?" "Will visitors who miss the concept of refraction in gallery I be confused by the reintroduction of that concept in gallery 3?" "If we need to be redundant, how much is enough? How much is too much?" Curators and designers do not simply sequence and make room for groups of objects; they compose them according to complex classification or thematic orientations. Even more complex are the affective theatrical aspects of environmental design. Researchers have often avoided broad questions about the design of museum environments in favor of research that focuses on the minute and the measurable. These studies asked questions such as, "How much text will a visitor read?" or "What size font do visitors prefer?" We wanted to design a study that focuses on the larger aspects of the learning environment. But researchers can only see visitors' responses to the learning environment when design features are actively used or when they become a hindrance.

One approach to understanding the museum exhibition as a learning environment is the "design experiment."² In design experiments, elements of an exhibit are systematically changed over time and visitor response to each modification is studied.³ These experiments include large-scale prototyping and conceptually driven didactic models employed most commonly by science museums.⁴ While costly, the design experiment is effective.⁵ As museums turn to more expensive technology-based exhibits, we are beginning to see more prototyping, front-end evaluation, and mock-up design tests.⁶ Science museums, with their explicitly di-

dactic mandate, lead the field in this regard, with most utilizing some kind of exhibit prototyping.⁷ In most other museum contexts, prototyping is too time consuming and costly to consider on a regular, ongoing basis. Furthermore, in art museums, where artworks on loan often come for installation with their own security guards to monitor the installation, exhibitions cannot realistically go through this process.

Within our study, the learning environment was one strand of a more complex system of study. We did not conduct design experiments that evaluated the effectiveness of an environment but rather encountered exhibitions as *faits accomplis*. We were not expecting or expected to alter the installations in any way. Therefore, the impact of individual factors within a given exhibition's learning environment was not gauged. Features were measured in a flexible but consistent fashion to account for a group's specific use of that environment.

The Concept

The concept of the learning environment is partially restricted by the ways in which visitors engage with design elements, but the concept should be understood to include the full range of craft associated with display in a museum. Museum exhibitions are not meant to be "books on walls"; they are meant instead to operate on a visual level. Object placement and relationships are carefully thought out. Color choices, font style, lighting, and even ambient sounds are considered key parts of the exhibition design. All of these choices create a particular mood, an affective experience for visitors. Museums offer an immersive environmental experience. Think of the experience of walking through the cavernous, quiet halls of the Metropolitan Museum of Art versus the experience of looking at small prints in an intimate gallery setting; or consider the smell of wood smoke at an outdoor pioneer village versus the white noise and cool, air-conditioned, open spaces of a modern art museum. These three-dimensional, multisensory experiences remain somewhat elusive for the museum researcher, as visitors tend to remark on them most frequently when the environment is a hindrance.⁸ When the environment functions in support of the message of the exhibition as intended, it seamlessly blends into the experience.

In the research literature some attention has been devoted to the examination of these more complex aspects of the environment. For example, Duncan and Wallach's classic study suggested that the architecture of the temple-style museum might impact visitor experience, create a pilgrimage-like ritualized approach to walking the long halls and gazing at iconic masterpieces.⁹ Other studies examined the connections between styles of entranceways and museum missions.¹⁰ Ideological studies of museums have examined the ways in which museums, through their

systems of display, have supported and cemented the very structures of knowledge maintained by different cultures.¹¹ Researchers are beginning to look closely at the rhetorical systems present within exhibition narratives themselves.¹² In the humanities, researchers have realized that museums and exhibitions are key sites of cultural production and therefore merit closer attention.

Museum professionals are calling for more systematic methods of exhibition criticism as a way to move beyond personal opinion, or audience numbers, to look more closely at the workings of the exhibition as an experience.¹³ Museum researchers are looking toward models from environmental psychology to assess the affective impact of exhibitions. Environmental psychology looks at issues such as, "How little personal space can a user tolerate before he or she feels the sensation of being crowded?" and "What details will create a sense of an eighteenth-century drawing room?"¹⁴ Similarly, market-based research on shopping patterns, trends, and consumer preferences offer insights into visitor experiences with the museum environment:¹⁵ "How long will a consumer wait in line for a cashier?" "Does the consumer tend to select items at eye level?" "How does a consumer orient herself to the space upon entering a shop?" The limitations to such studies lie in a potentially flawed mapping between commercial goals and leisure learning ones. The analysis of the exhibition as a conceptual whole and the psychology of environments have not yet made their way into more empirical discussions of visitor activity.

From a sociocultural perspective, the learning environment can be seen as offering affordances for the activity of meaning construction and interpretation or as creating obstacles to it. The learning environment supports the generation of new emerging goals among the active participants in a visiting group who are stimulated by small details of exhibit design and larger features of the overall environment.¹⁶ Museum designers and curators focus on these multiple levels of design and detail, using changes in lighting, placement, and object groupings and isolation in order to point out significant ideas to visitors;¹⁷ yet the problem of determining the contribution of the learning environment to visitor learning in museum research remains large, complex, and resistant to simple categorization and measurement. We chose to examine the learning environment in two ways: one that reflects physical features such as benches and resources, and one that reflects intellectual features such as large-scale, thematic text panels.

Physical Environment

Clearly, the physical features of a museum exhibition influence the learning environment. For example, the presence (or absence) of resource areas (tables and books) spaced throughout an exhibition communicates to the visitor not only expected activities but expected levels of involvement: "Sit down and read up. Ex-

plore this material." Or, perhaps, "Leaf through this catalogue for a moment before continuing with your tour." The presence (or absence) of physical guides and prompts for paths through a particular portion or all of an exhibition share with the visitor the curatorial team's ideas about both visitor needs and desires for guidance or independence. "Choose your own route through the exhibition, and here are some supports to assist you"; or "Follow the ideas in sequential order as we desire you to do." The presence or absence of benches or clear directions to the restrooms also communicates to the visitor how the museum values their comfort.¹⁸ The presence or absence of comment books and feedback mechanisms indicates to visitors the value museums place on their opinions.¹⁹ Engagement with these aspects of an exhibition are relatively easy for observers to capture; but, even in the case of simple feedback mechanisms, such engagement is not necessarily highly predictive of either total enjoyment or learning.

The physical environment may also work against the visitor. Some portions of an exhibition can be ambiguous and confusing, leaving the visitor puzzled with respect to his or her role and expected activity; or the visitor may find the path through an exhibition confusing, due to either a lack of guidance or confusing signals. Perhaps the lighting at a display throws a glare on the object or label that makes it difficult to see. Perhaps directions for using a hands-on exhibit are confusing, or the exhibit is temporarily out of order. Finally, the physical environment of the exhibition is influenced by the social context of the museum itself—the crowded presence of other visitors, or the isolated feeling of a quiet gallery; the shrill or calming voice of a docent; and the friendly or intimidating guard watching over the artifacts. The point is that not all of the physical aspects of an exhibition are supportive.

What to measure remained challenging. Specific behaviors such as sitting on a bench or pointing to a wayfinding device were simple to observe and to trace but occurred so rarely that they made little impact on the visit.²⁰ While features that influence ambiance, such as wall color, might well play a role, the effect of these design decisions on visitors could only be determined by visitors' commenting directly on those aspects, and that too was a rare event. Finally, mentioning the physical environment was most common when something proved to be an obstacle to visitors rather than support for their experience.

As chapter 2 described, there were many physical differences between exhibitions. To sense some of these differences, consider just the entrances to each of these exhibitions:

- Two glass doors separate the modern gallery space from the hallway. Opening the doors, the visitor is greeted with a cool breeze, which is augmented by cool blue walls, shiny aluminum objects, and a gently curling aluminum banner that leads the way through the galleries.

- Entering the galleries, visitors' eyes struggle momentarily to adjust to the low lighting levels and dark brown walls. Visitors are confronted by a case of shiny sparkling objects highlighted by boutique lighting, directly in their path. A brilliantly pure colored spectrum radiates from a prism overhead, directing the visitor to the right and into the show.
- In the depths of quiet exhibit halls in the natural history museum, visitors approach the vestibule for *Indian Hall*.
- A tightly compacted group of display cases filled the gallery, and visitors passed by a collection of marketing items, large-scale photos of African royalty from the turn of the century.
- At the very back of the cavernous high-ceilinged interior of the museum, past the children racing around the wind tunnel and shrieking at the soap bubble stations, just past the cafeteria and clunk-clunk of blocks at the bridge building station, temporary walls define the boundaries of the show.
- The *Automobile* exhibit is marked by an overhead highway sign, a carpet "road" with dotted yellow lines, and lots of neon road signs for motels, fast food, and advertising cars.
- After following a dusty winding dirt path through the trees, one emerges into a little village. Smoke curls from a small log cabin, and a brown cow lifts its head and bellows. Two women in long dresses and bonnets walk by arm in arm talking about Mrs. Whitaker's newest quilt.

As tangible as each exhibition was in terms of its actual atmosphere, entrance, sound, and layout, each exhibition also carried a unique set of intellectual communicative messages.

Intellectual Environment

In addition to the physical attributes of the learning environment, there are features that serve to support the curatorial messages of the exhibition. Labels and signposts help visitors to conceptually orient themselves within the exhibition story. Many museums use a system of layering to demarcate sections and subsections of an exhibition. The nature and number of layers vary from exhibition to exhibition and may change even within a single one in order to support the curatorial message. In the *Light!* exhibition, for example, there were five levels of intellectual signposting. Room-level divisions marked broad thematic areas: A Ray of Light, The Light of Nature, Makers of Light, Personal Lights, and Public Lighting. These room-level headings were the titles for text panels that included approximately 100 words of text. Within each of these areas there were second layers of signage. In the Makers of Light room, for example, four one-word titles—God,

Reason, The State, and Capitalism—indicated the subtopics. An addition level of distinction occurred with smaller group labels that discussed several objects, or a class of objects. In the area called “The State,” for example, “Fairs” discussed the development of world fairs during the period from 1750 to 1900. The *Light!* exhibition had many levels of signposting, but not all exhibitions had these one-word section labels, subdivisions, or wall-panel texts, nor did each show necessarily have parallel levels of signage and labeling within each section. In the *Automobile in American Life* exhibition, for example, major sections were clearly marked with overhead signage, such as “Custom Design” or “Buggy to Roadster”; smaller signposts were used to provide an overview and orientation within the chronological story “spine” of the evolution of the automobile.

For coding and analyzing the intellectual aspect of the learning environment, we noted where visitors engaged with room-level, section-level, and group-level labels. We also included visitors’ comments about the color scheme or other devices in the learning environment if visitors noted that these features were designed to assist in delivering the intellectual message. Conversation that featured specific reading of object-level labels was reserved for analysis within the explanatory engagement category of visitors’ talk, as discussed in the previous chapter.

The next section provides examples of curatorial considerations of, and visitor responses to, the learning environment. Each example features a specific exhibit within a show, giving the combined voices of the curator, when he or she explained or planned for the exhibition, and those of the visitors when they were touring. The examples focus on language that describes the plans or responses to both the physical and the intellectual aspects of the learning environment. The section also includes a few examples when some other unintentional aspects of the museum environment became moments of concern or learning for the visitor. It is important to remember, however, as indicated throughout this chapter, that responses to the totality of the environment are complex and are carried by more than the verbal discussions of either the curator or the visitor.

Examples

The first set of examples focuses on physical aspects of the learning environment that were deliberately designed to communicate to visitors. More clear-cut examples of manipulation of the physical environment are presented first, followed by those that are more distinctly intellectual. The examples are drawn from all of the exhibitions.

In the *Light!* exhibition care was taken to create a layout that would encourage visitors to attend to the main issues and themes of the show. The curator wanted

a very small but important still life, Chardin's *Glass of Water and Coffeepot* (ca. 1760), to illustrate the concepts of reflection and refraction. The painting had to compete with large and glittering objects in cases nearby. She talked of how the design of the exhibition was altered in order to help the Chardin painting stand out:

You sort of have to put it off by itself and make a big fuss about it—it looks so humble—so people will get the point. So the bench and the lighting and the isolating space and even the dumb little acoustiguide symbol all tell people “it’s important, guys, it’s important.” People will look at the acoustiguide picture even if they don’t have the acoustiguide. So we have to tell them all that. (Louise Lippincott)

Visitors did not directly comment on the particular design features surrounding the Chardin painting; but they did, in fact, notice the painting, and many studied it closely. Twenty-seven out of the thirty-two groups stopped in front of this painting. One mother and her college-aged daughter were among the groups who noticed the painting and commented about the light effects that Chardin created:

Mother: [pause] That’s interesting. Look at that glass of water.

Daughter: Uh-huh.

Mother: And to paint that, and to paint that dense pot. I mean you get the idea of the depth and the water and the glass.

Daughter: Let me tell you, drawing glass and water in a glass is one of the hardest things you could ever do.

Mother: I bet.

Daughter: We had to do it in, uh, back in freshman year. (LT 21/I3)

In the *Aluminum by Design* exhibition the design details were very subtle but carefully thought out. The curator wanted visitors to feel they could make choices and construct their own route, but she also wanted some sense of guidance and direction. As she walked through the exhibition with us, she highlighted this issue at the beginning:

The exhibition is laid out in four main sections. We very much wanted to layer everything. So the introductory panel here sort of tells you that there are four main sections, introduces you to the color-coding and all of that sort of thing. We worked with designers for the layout of the show. And we very much wanted not a linear tour. So that there’s a certain amount of flexibility and freedom and the ribbon is actually meant to guide you through. (Sarah Nichols)

Many of the visitors noticed the aluminum ribbon snaking its way through the galleries high above the exhibits. They tended to perceive it as an added bit of

artistry rather than primarily as a guide, but it worked very well. In the example below, a family notices both the ribbon and some aspects of its function—as a means of foreshadowing upcoming sections of the exhibition.

- Son:* Hey! Look at that really, really, big sheet of it that's curling.
Mother: Oh, yeah, it goes through this whole display. Did you see the map of it outside?
Son: No I didn't.
Mother: See, you read it: "The Modernist Ideal."
Father: Yeah.
Mother: It tells you what you're going to look at next. (AL 01/22)

As one might expect in a show on light, a considerable amount of effort was expended on the design of lighting for the *Light!* exhibition. Contrasts of dark spaces with spotlights and bright airy skylights predominated. In *Light!* the curator had an explicit goal of using lighting to jolt the visitor:

This room, the purpose was to shake people up a bit, who were expecting to see a traditional art show are seeing two paintings, and a whole lot of other stuff. It's really a gallery to disorient and reorient until we move to the next room where we deal with more paintings. They love the drama of it. The darkness and the light.
 (Louise Lippincott)

Visitors responded to this manipulation fairly directly: "Wow, look at how bright this room is! Wow." Other visitors seemed to go even deeper to understand the complex and consistent manipulations within and between rooms.

- Boy:* Oh, I figured this out now. This is daylight, and that's moonlight . . .
Girl: Yeah.
Son: . . . and so it changes every room you go into.
Girl: Oh, yeah.
Son: I finally get that now. (LT 27/48-49)

While it was clear as we watched visitors moving through the different galleries that they were aware of the lighting and responded to it, such direct comments were rare.

These examples focused on physical aspects of exhibition design and the responses to them. But other examples of physical design features were not as clearly constructed or responded to as physical supports. In some cases a physical feature such as a routing was intended to support a particular intellectual position. One instance of this involved the dividing highway line that marked the "spine"

through the *Automobile in American Life* exhibition at the Henry Ford Museum. As a reviewer of the show noted, the timeline running down the middle was meant to cover two topics: the evolution of the automobile industry and the technological developments of cars. The spine was oriented so that visitors would start with the most recent and familiar cars (the first Honda made in the United States) and move back to the unfamiliar past.²¹ The curator emphasized that this strategy was designed to take visitors from the current and familiar into the darker, less familiar, and presumably less accessible past. However, people tend to think of time as moving forward not backward; thus two ways of looking at time (as a present dictated by its past, or as a past evolving into its present) were in collision for visitors.

Woman: I wonder why they have this arranged backwards, sort of; you go from the newest to oldest.

Man: The D probably stands for something else, I don't know. [responding to an earlier unrelated query]

Woman: Oh, there's a Hud mobile. Oh, duh. Made by Huds.

Man: The Chalmers. I wonder if that's the same as the farm implement company.

Woman: Oh, look at all the different insignias. Crossley.

Man: I think we're going backwards, that's the problem.

Woman: Well, that's what I said. Why was the exhibit set up this way? [pause] Maybe you start with the known and go to the unknown? (HF 22/2)

The couple was aware of the overall structure of the exhibition, while at the same time they were responding to a specific object on display. They seemed to feel that the exhibition was designed with a plan; yet they started out believing they were going backward and "that's the problem." The man assumed they were simply doing it wrong while the woman believed that the museum designed it wrong. However, she continued to search for underlying rationale and did come up with an explanation.

In other cases, there were features of the learning environment that were both more deliberately intellectual and more didactic. In all of the exhibitions there was some level of signage that either attempted to orient the visitor to the core ideas writ large (both literally and figuratively) or was designed to tie together some of the collections of items and to point out their central thematic features. In *Africa: One Continent, Many Worlds*, the introductory material was designed to shake up the visitor in a different way from the light changes in the *Light!* exhibition. *Africa* was near the very end of a long tour (five years). The curator explained the design:

The museum wanted to look at what Africa *really* is like and to combat the disinformation that Americans often have about it. And they wanted to connect it with people of African descent. . . . So the first step was to do audience research to find out what people actually know about Africa and what they want to find out. When you ask questions like these [pointing at exhibit]—"Can you name five African countries?"—most people could not; they started making up names, like "Zimwagbia." "What do Africans speak?" Well, you know, Africans all speak Swahili! "They speak African." Africa is often covered in the news in terms of negative media, crisis-oriented stuff, and people don't have any kind of background in which to contextualize that. It's not covered in general public school education at all. . . . So, there were a number of goals in doing this exhibition. (Deborah Mack)

As an introduction to the second room of the *Africa* exhibition, there was a set of displays that served to orient the visitor to demographic and geographic features of the continent and to raise specific questions that might address common misconceptions. The display itself was somewhat worn looking, but it attracted quite a few visitors. One of the groups who used the flip-label introductions was a couple who, as they worked through it, confronted their own misconceptions (e.g., forgetting that Egypt is in Africa).

Man: Uh-oh.

Woman: Islam. And some other stuff.

Man: Well, I imagine Christianity is in there.

Woman: "Islam, Christianity, belief systems that are retained in various African societies. Smaller number practice Hinduism, Judaism, and Bahai." [reading label answer] Bahai. "How far back does Africa's written history go?" [reading label question]

Man: Probably pretty darn far back.

Woman: "Hieroglyphic writing from Egypt." Duh.

Man: Duh, that's right!

Woman: Yeah. There you go.

Man: That's right. You're totally correct—in my mind I totally divorced Egypt from Africa. [chuckles]

Woman: Exactly! See?! It's not just me!

Man: No.

Woman: "6½ million people sailed across the Atlantic before 1776. How many of these people were African?" A whole hell of a lot!

- Man:* Before 1776?
- Woman:* Before 1776. Yes. There were a whole lot of slaves before 1776. [flipping label to show answer]
- Man:* Wow!
- Woman:* "5½ million people. 92% of those that crossed came from Africa." I had no idea! "Can you name the largest African cities?" No.
- Man:* You're right.
- Woman:* Cairo?
- Man:* Uh . . .
- Woman:* I only know two African cities, three maybe. [flipping label to show answer] "Cairo . . ."
- Man:* You're wrong, Cairo's not on there. Oh, there it is.
- Woman:* "Casablanca, Ivory Coast Ab-" I can't pronounce that. "How many people live in Africa?"
- Man:* A lot more than in this country. [chuckles]
- Woman:* "248 million, 239 thousand. I out of every 6 people in the world lives in Africa." "How many countries is Africa divided into?"
- Man:* Oh, It's like 80, isn't it?
- Woman and Man:* "54!"
- Woman:* Oooo!
- Man:* Two more than there are in deck of cards. (AF 26/49)

This example of conversation is probably the response desired by the curators as they envisioned the exhibition and its visitors. The man and woman asked each other questions, made guesses, however vague, and then were amazed by the correct answers provided. In this example we also see a willingness of visitors in our sample to do what they felt like doing in spite of being recorded. They did not appear to be inhibited by revealing a lack of knowledge. They were unable to answer any of the questions (except for Cairo) and yet they proceeded on with the discussion and activity.

The environment, writ large, also affects the visitors in ways that reflect neither the physical nor the intellectual intentions of the curatorial team. The environment is dynamic and changing, and other visitors, staff, guards, sights, and sounds all influence the experience. The experience of the museum's learning environment is shaped by the social context in which the experience takes place. In some cases, such as the Exploratorium's *Behind the Screen* exhibition, the social context was frequently one where the crowdedness of an exhibit station meant that people at the periphery who were not actually "working" the exhibit felt free to make comments and interject their opinions with members of another group.

In the following example, a teenage boy and his father approached the Music Supervision station. At that station, visitors could choose from a sampling of different movies and edit the sound in a scene by inserting different music. The exhibit illustrated the impact of music selection on the resulting mood of a film. In this case, the two visitors first watched another family group work on a movie. The two groups began to share in the experience, commenting back and forth as well as conversing within their original groups. The father and son then sat down to try their hand, while the first group watched this group's selections and choices.

Father: That's the original scene; that's the original music from the scene.

Son: What is it?

Father: Hmm?

Son: What is it?

Father: *Twister*.

Son: Oh, this is *Twister*?

Other Mother: It's one of the more exciting scenes from the movie.

Man: Ha. Well, they've *got* to be pretty exciting after this part!

Other Mother: [to her kids] Just move the track ball. Go to *Vertigo*.

Man: Oh, there's *Independence Day*. This is really neat, isn't it?

Son: Yeah.

Father: Did you see this? Didn't we rent this, *Vertigo*?

Son: No, I've never seen it.

Father: We never got *Vertigo*; we were going to rent it, weren't we?

Son: We rented *Citizen Kane*.

Father: No, but *Vertigo* is a Hitchcock movie.

Son: A what?

Father: Hitchcock, Alfred Hitchcock.

Son: Oh.

Father: So, without the music it's just . . . No big deal. But the music, the background just adds so much.

Other Mother: We're not picking the most exciting scenes.

Father: Nah.

Other Mother: But it's a long scene.

Father: Okay.

Other Mother: Okay. Here's your choices. Opera. [opera music plays, then they choose spooky music, and spooky music plays]

Father: So that makes it more mysterious, that kind of a scene. [music changes again]

Other Mother: I think maybe the opera sounds better.

- Son: Yeah, that makes it mysterious.
- Father: Yeah, doesn't that add just a whole different feeling?
- Son: Feeling.
- Father: Yeah, you know something sinister is going to happen.
- Son: Yeah, wow.
- Father: Yeah, this is great! I mean this changes the whole feeling of the scene. [more spooky music playing] So the hair is the same.
- Son: Is that the real music?
- Father: No. The real music is this one down here.
- Other Mother: You want to play the real music so we can see what it looks like with the real music?
- Other Son: Yeah. This is the real music?
- Father: Yeah.
- Other Mother: Now hit "listen to selection." [music plays]
- Father: It's nice to be able to see the soundtrack isn't it, to be able to edit that?
- Son: Yeah, definitely.
- Other Mother: We'll have to get the movie and find out [responding to a query out of range; new music plays; conversation among doers continues]
- Father: So it's not as sinister. But there's still something . . . see I think this one's more sinister there, but there's still something mysterious going on here.
- Other Mother: It seems like for most of these there's a music selection that works better than the original.
- Father: Well, this was pretty good. I mean it made it even more sinister than it was.
- Other Mother: [to her kids] Okay, let this gentleman behind you do it.
- Father: You want to try one? Do you want to do one, or? Okay. Let's try, which one do you want to try? Do you want to try *Independence Day*? Watch the scene.
- Other Mother: This guy was in *Jurassic Park* also. [they stand behind now and watch the father and son do *Independence Day*]
- Father: Yeah. (EX II/17)

These two groups developed a new set of goals momentarily as each became a part of the other's "learning environment," albeit one that the curatorial team could not have predicted. In some sense the jointly constructed responses affirmed both the significance of the activity with which the two groups were engaged and the

sensibility of their interpretations. Also, of course, the cross-group interactions made the experience more fun.

At another level, there is the negative impact of crowds on the learning environment. The next example shows a couple reacting negatively to a sudden surge of people into the gallery. The couple had been gradually making their way out of the gallery, retracing their steps back to the main entrance of the *Light!* exhibition, revisiting their favorite paintings along the way. They were looking at a painting by Hunt called *Pretty Baa Lambs*.

Husband: Baa lambs.

Wife: What, as opposed to the non-baa lambs? [large noisy group walking through on docent tour]

Docent: I wanted to point these two out because . . .

Wife: Ah. We're in the middle of a tour group. A couple. Oh good, they're off the cathedrals. [they walk over to two cathedral paintings by Monet] [pause]

Husband: There were Rouen cathedrals in the d'Orsay.

Wife: I know, there were boatloads of them!

Husband: Oh, I know. I know.

Wife: There are so many. How many were there? Three or four?

Husband: Well, yeah.

Wife: Well, they were sequenced. But there weren't two morning effects; they were different sunlight.

Husband: No, right, there were morning and afternoon.

Wife: And, yeah, they weren't the same.

Husband: They were very distinct. [pause]

Wife: That's just too . . . I'd love to see a whole bunch of them together at the same time and sit for hours and stare. Oh! Forget it! I don't like those other pictures well enough to beat somebody up to go and see them. It's getting busy.

Husband: Yes.

Wife: Very busy.

Husband: All the tourists.

Wife: Did the bus stop out front or what? My gosh.

Husband: Like, a tour bus got off.

Wife: Yeah, that's what I said. Let me out of here. This is too much. I don't want to deal with this. It's like docent tours or something. [noise increases as they move through the incoming throngs of people] Help Help. Good Lord. Get me out! (LT 16/112)

These two visitors were sophisticated and experienced museumgoers. After looking at the entire exhibition they retraced their path back to pieces that they particularly enjoyed or wanted to examine more closely. The presence of huge crowds funneling through the galleries, coming toward them in the opposite direction and filling up a space that had been relatively quiet and calm, coupled with the very prominent presence of a docent with another large cluster of people, derailed their plan. While they may have been more vocal than most about their dislike of the situation, we certainly saw, and have experienced, similar situations where crowds or large group tours end a small group's visit prematurely.

We provided the two previous examples to explicate the way the learning environment is always shaped not only by the intended plans of curators and designers but also by the unintended actualities of a visit taking place on a particular day or at a particular time and place. Sometimes these environmental factors are facilitative of engagement, as when the two family groups merged; at other times, these actualities are disruptive, as when a large crowd suddenly filled a quiet space.

The final example shows an unexpected and unintended positive outcome of social context. In this case, two twenty-year-old women had come from West Virginia to Pittsburgh and had stopped by the CMNH to see the renowned dinosaurs. The CMNH was closed, so instead they wandered into the adjacent art museum (CMA) and found themselves at the *Light!* exhibition. Neither visitor had ever been to an art museum before, and they did not realize that they were not supposed to touch the objects. They walked up to the first painting that they saw in the exhibition and touched it, prompting the guard to come over and speak with them.

Woman 1: Oh my God, look at this. This is ancient. Who did this? Giovanni Batiste Pittoni. [she touches the painting]

Woman 2: You can't touch it!

Woman 1: Oh, you're not allowed to touch? [reading label] "It was an Italian, an allegorical monument to Isaac Newton." Oh my God, look at that! I wonder what it's worth.

Woman 2: They're busty women. They'd like me!

Woman 1: They were big women. That's what they were back then. You see like angels or cherubs or something.

Woman 2: Oh look, a prism. Oh gosh, that's how they did it. Can you imagine how much time it took to draw all this?!

Woman 2: Draw this? They painted it.

Woman 1: Look at the wings on that angel. That's a fat little angel there. What do you see in this picture? Do you see just different concepts of life, and different little . . . like right here, this dude's trying to paint something.

Guard: You're too close!

Woman 1: Oh really? Is there anything—I don't know anything about art. Do you know anything about the facts? Like about how much something like that is worth? Do they tell you?

Guard: No. No.

Woman 1: Can you imagine how long it took the guy to paint that?

Guard: And how long ago it was done.

Woman 1: *That painting* was done in 1727! No, Giovanni Battista did it in 1620 . . .

Guard: Let's see, between 1727 and '30.

Woman 1: Oh my God! He painted that *then*? That's unbelievable.

Guard: And look at what good condition it's in. That's because nobody's allowed to touch it.

Woman 2: And your hand was over the line. You'll get arrested.

Guard: You're not even allowed to touch the frames. (LT 15/4)

As many researchers have noted, the first and most salient contact that many visitors have in a museum is with the museum guards. In the quiet space of an art gallery or museum an admonition by a guard, no matter how quietly and politely done, can be quite a humiliating experience for most people. But in this interaction, the guard made a lovely educational move, showing the visitors how very old the painting is and then, with a clever segue to her own goal, she explained that the painting looks so good in spite of its age because no one has touched it. This interaction with the guard left the visitors informed but presumably not feeling chastised.

Findings

Different museums may attract different kinds of visitors with different intentions, and the same visitors may have different expectations at different venues. The hushed stately pace of the art museum invites an examination of the entire environment. The cacophony of the science museum both visually and auditorily tends to press visitors into a close manipulation of the object at hand—literally. The learning environment is reflective of both design and visitor actions. In measuring the learning environment aspect of our model, we focused only on the interactions with intentional design features.

This section presents the measure of the learning environment that was used in our study. The measure's relationship to the various museum exhibitions and to the other measures of learning in the museum is likewise described. The measure of the learning environment is the number of segments in which the visitors

commented on the environmental designs or read large-scale text panels. Just as with the construct of identity, there is more in the learning environment that we saw, and even more that existed, than what is captured by any one set of measures. Why? First, the curators and designers of an exhibition may craft many aspects of the total setting, but in order for an environmental feature to be used as a measure, researchers must connect aspects of that crafting to the actual behaviors and discourse of the visitors. Thus, if a visiting group seemed to respond to some environmental aspect but neither spoke about it nor stopped and read about it, then there was no record of it. Second, since we studied visitors' activities and not the exhibits themselves, codes had to be linked to visitors' behavior. For more details about the coding and the results see the appendix on methodology.

Figure 5.1 displays the mean scores on the measure of learning environment (LE) by exhibition. The scores represent the average LE score for a group visiting the particular exhibition. In both the *Light!* and *Aluminum by Design* exhibitions visitors were likely to comment four times or more about aspects of the learning environment, whereas in the *Behind the Screen* and *The Automobile in American Life* exhibitions visitors commented less than once a visit on average. The measures are probably very accurate with respect to the frequency of noticing environmental features (they saw a feature, commented on it, and it was recorded) but less precise with respect to the lack of notice (that is, they may have noticed a feature, not

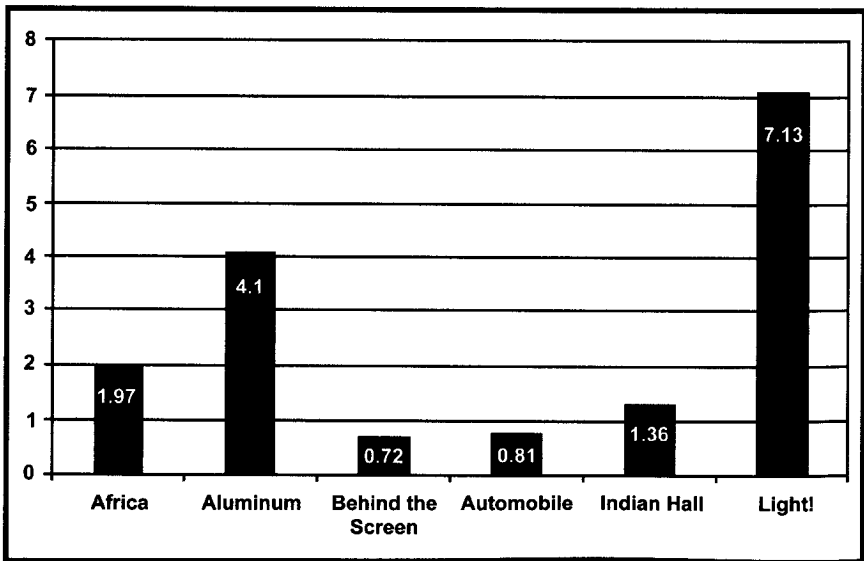


Figure 5.1. Mean learning environment scores for each exhibition.

Table 5.1. Correlation Matrix

	<i>Learning Environment</i>	<i>Identity</i>	<i>Conversation</i>	<i>Learning</i>
Learning environment	1.00			
Identity	.28	1.00		
Conversation	.47	.41	1.00	
Learning	.55	.44	.66	1.00

commented on it and thus it was not recorded OR they did not notice the feature and did not comment on it.)

We now turn to the simple correlations between the measure of learning environment use and comment and the other measures shown in table 5.1. The table displays the zero-order correlations among the measures. The identity of the visiting group is what visitors bring with them, and the learning environment is what the curatorial and design teams leave for them; thus, one would not expect to see a large association between LE and the measure of identity, and we do not (.28). However, one would expect to see a stronger association between what people discuss in a meaningful way about an exhibition and what they notice about the learning environment. There is indeed a stronger association between LE and conversation (our combined measure of analysis, synthesis, and explanation) (.47). Finally, the learning environment should affect learning that went on in the exhibition, and it does (.55). The correlation matrix shows that the learning environment, identity, and conversation all support learning.

Message

Of the three central dimensions of our model (identity, conversation, and environment) we struggled most with the role of the environment. This is where museums can enhance their effects, and so it is critically important. However, it is also the case that the environment is designed to do a great many things as well as to influence the level of learning and the feeling and disposition toward the exhibition itself. At some level the environment is composed of specific items, such as benches or flip labels, which can be moved, added, subtracted, and essentially tested for their impact. The learning environment is where the curatorial voice is spoken, and the measure of engagement with higher-level text panels is our estimate of whether that voice was heard. Initially, the physical cues and their responses were analyzed separately from the intellectual ones, but this was in some sense an inappropriate separation; thus in the end the two features were combined.

An intervention study would be necessary to study the learning environment more thoroughly. What kind of intervention might be best? Explicit questions

about whether people noticed the environment or how they might change it might be useful. Also, a variety of short studies could be done with virtual tours before or after a group visit. In these computer simulations, certain features such as wall color or clustering of displays can easily be manipulated and examined for their effects. Reactions to virtual tours could be compared directly with real visitor experiences. For example, suppose that one wanted to understand the impact of the strong difference in wall color from gallery to gallery. One could design a study in which the virtual reality mimicked the actual one and see how visitors responded in both the real world and virtual environments. Then one could manipulate the colors, eliminating the contrast in the virtual world but leaving it in the physical one, and so forth. Differences in memory and in commentary would help elucidate the impact of that single manipulation. Third, one could use more long-term tools such as follow-up phone calls and even visitor diaries in which the overall impression of a visit is as likely to be recorded as is the response to any particular object.²²

Questions

Museum learning is a complex issue. We invite you to turn back to chapter 2 and decide which aspects you would choose as the focus of your own queries in an examination of museum learning environments. How might you design a study to examine more fully the features of a museum learning environment? What trade-offs do you envision? What would you ask in an interview, and when would you ask your questions? How could you document the use of the learning environment? What unique and innovative tools, such as computer simulations, physical mock-ups, or diaries, might you use? How might you think about the overall and holistic atmosphere of these environments? If you were to design a set of studies that focused solely on the impact of the learning environment, what might that study or set of studies look like?

Notes

1. Stodolsky 1988.
2. Brown 1992.
3. See, for example, Schauble et al. 2002.
4. Allen 1997.
5. Another kind of experiment has been used extensively in the field of visitor studies in which visitors' behavior is measured in response to changes in the layout, context, or labels of exhibition.
6. Examples of different approaches to this research can be found in Bitgood et al. 1987; Serrell 1997; Korn 1988; Allen 1997.

7. Schauble et al. 2002; Crowley and Galco 2001.
8. Falk 2002; Bitgood and Loomis 1993.
9. Duncan 1995.
10. Yanow 1998.
11. Hooper-Greenhill 1992; Bennett 1995.
12. Greenberg, Ferguson, and Nairne 1996; Roberts 1997.
13. Falk and Dierking 1992; Serrell 2001.
14. Dean 1996; McLean 1993.
15. Underhill 2000.
16. Schauble et al., 2002.
17. Knutson 2002.
18. Hood 1993.
19. Worts 1995.
20. We are aware that our method of collecting data might have influenced visitors not to sit down or stop. While a few groups did stop and sit, most continued on with their tours, perhaps aware of the researcher's time.
21. Pursell 1992, 241.
22. Leinhardt, Tittle, and Knutson 2002.