CHILDREN'S LEARNING IN MUSEUMS WITH THEIR FAMILIES

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Museums have not always given visitors much of an active role in constructing their museum experience. Traditionally, museums thought of their staff in their complementary roles of collectors and preservers of collections of artifacts and researchers using those collections. Exhibits were developed based on the logic of the collections and the researchers' understanding of them. Visitors were expected to be able to access the collections on the same terms as the museum staff. The most knowledgeable visitors were seen almost as amateur researchers; those less knowledgeable were expected to make sense of the exhibits through the lens of the professionals who curated exhibits.

In the past few decades, many museums have placed more emphasis on responding to museum visitors' interests, abilities, and roles. Visitor priorities have taken a more central role in determining content and presentation. Research on people's motivations for visiting museums (Falk and Dierking, 2013) indicates that visitors view a trip to a museum as being both educational and entertaining. They also see their visit as often being a socially motivated event, a way to spend time together with friends and family. And for parents and other caregivers, they see a museum visit as a way to introduce their children to new and exciting educational experiences that will be motivating for the children because they are also fun.

Museums, then, have increasingly come to see themselves as one of many options for how families chose to spend their leisure time. And especially for museums that depend on entrance fees as a significant part of their financial resources, attracting more visitors and ensuring their satisfaction have become central to their financial stability. With this new emphasis, museums have not abandoned their central role as educational institutions, but they have come to understand that learning in museums must be interesting and fun if the visitors are to find their visit satisfying.

This increased emphasis on how visitors use exhibits and what they get out of their experiences has led to recognition of a dual responsibility for museums: first, they must develop intentional environments that present information through the use of artifacts in context and then they must understand the quality of the visitors' learner-driven encounters with those environments. This second responsibility has led to the blossoming of evaluation studies and the field of visitor behavior research. And since most museum visitors experience the museum with their friends and family, research on visitor behavior should include studying how meaning making occurs not only in individuals but across individuals through social interaction. Children's meaning making, and how it is supported by their parents and caregivers, is a special instance of this larger field of interpersonal engagement with exhibits and programs (Borun, et. al, 1998; Hilke, 1987). This chapter will explore what factors contribute to such family learning and what implications it holds for museum practice.

The Central Role of the Parent in Family Learning

Many museums, especially children's museums, adopted approaches found in early education when they began to consider how to design exhibits for children. Two popular models for designing exhibits for children were borrowed from the approaches developed by Montessori and Piaget. Both of these approaches focused on the individual child, or small groups of children of similar ages who were accustomed to working together in the classroom.

Montessori developed a curriculum that was based on carefully designed manipulatives that were structured in such a way that proper use of them would lead children to make connections and learn principles involved in mathematics, literacy, and other domains (Montessori, 1967). An example of such a manipulative is a set of spindles of different heights, each painted a unique color; accompanying the spindles are a set of beads that can be placed on the spindles, with just the correct number of each color so that when the beads and spindles are matched by color, each spindle will have a unique number of beads and all the beads will have a home. For example, the shortest spindle would be the height of one bead, and if painted red, then there would be only one red bead given in the set. The next spindle would be the height of two beads, and if painted blue, then there would be two blue beads given, etc.

This goal-directed approach to children's play and exploration has proven to be very successful in Montessori early education classrooms (Lillard, 2012). The same approach has been widely used in children's museums and children-oriented exhibits in other museums, where exhibits explicitly pose externally presented goals, and support the accomplishment of those goals through the use of objects designed to guide children's interaction. But on the open floor of a museum, there is less control of the use of such manipulatives than there is in the classroom. Children may not always use the exhibits as intended. Previous visitors may have left the activity in a completed or semi-completed state, so it is not organized for the next visitor to explore properly. Some of the objects needed to understand the concept may be missing. If the task is hard for a child, they may not have the patience to persevere in the face of other tempting activities. Because engagement with such activities in a museum are done in a public space, are novel, and are learner-directed, there is much greater likelihood that the learning value of such constrained, goal-directed activities will be missed than there is in a teacher-monitored classroom.

Piaget developed a curriculum that also was based on children's direct interactions with objects (Piaget and Inhelder, 1969), but because he believed that children constructed meaning out of feedback from experimenting with objects, the objects in a Piagetian (or Constructivist) classroom are much more open-ended and flexible than those found in a Montessori classroom (DeVries, 1987). An example of such materials would be a set of blocks of different sizes and shapes. Though repeated play with these materials, children can test hypotheses and make sense of unexpected events.

Open-ended play with flexible materials is a second kind of activity that is often used in exhibits designed for children. Again, the ways in which the materials are used by visitors is often quite different from the way they might be used in a classroom. For most visitors, the amount of time they devote to exploring the characteristics of materials in a single exhibit is limited; if children

do not lose patience with the activity, then their parents eventually do, mindful of all the other activities and exhibits there are in a museum. Children have only a single opportunity to explore, as well, so they cannot build on previous experience and knowledge (unless the materials are already familiar to them from home or school), as they would in a classroom. And parents may not understand how such open-ended exploration can lead to learning, putting the museum at risk for being judged as nothing more than a play space.

The slippage in translation when these two established approaches to early education are moved to the museum floor has led exhibit designers and museum educators to consider other ways of designing for children's learning. There is ongoing tension between the advantages of goal-directed versus open-ended activities, even though it is not always explicit; often, exhibits are designed to operate in some middle ground between the two, where the characteristics of the materials offered provide some guidance but there is also some leeway in how they can be used. This approach has the advantage of insuring that a single exhibit can be of interest to a wider range of ages of children, since individual children can find within the exhibit a way to use the materials that interests them and within their ability to extract information from their engagement with the exhibit.

But more significantly, both of these approaches borrowed from formal education assume that the primary actor in an exhibit is the individual child. As museums have come to understand that visitors often organize their learning through interacting socially with the people they come with (in addition to other visitors) and have come to prioritize facilitating such interaction, they have placed increasing emphasis on supporting learning in family groups. And when designing for children's learning, they particularly place emphasis on how parents (and other caregivers) actively mediate the children's learning.

This focus on the social nature of museum learning has led many museums to adopt a sociocultural model of learning taken from the work of Vygotsky (1978). He viewed learning as occurring through activities that are shared with other people. While children first co-construct meaning at the "interpersonal" level (often with intentional guidance from a social partner who has more knowledge than the child), they subsequently internalize that meaning so that it becomes "intrapersonal," that is organized and accessed through internal meaning structures. This process takes place at the edge of the child's current understanding, what Vygotsky called the "Zone of Proximal Development." Social interactions that mediate or "scaffold" meaning by more competent others (teachers or other students), are the heart of the Vygotskian classroom (Berk and Winsler, 1995). Questions and comments are used to guide the child's participation, by simplifying the problem, calling attention to relevant information or parameters (without giving answers), supplying needed information, and motivating the child to engage or stay engaged.

Translating this approach to early education to the museum setting requires some assumptions on the part of the museum about parents' beliefs about how children learn through learner-directed activities and the roles parents will be prepared to fill. First, parents must see the potential for learning in children's play and exploration. Second, they must be motivated to help their children construct meaning together. They need to be comfortable being a play partner with their child. But at the same time, they must be prepared to take the lead to organize their children's

experience by doing those activities described in the paragraph above as "scaffolding," simultaneously participating in and organizing the children's activities to support learning. There is an expanding body of literature documenting how co-construction of meaning occurs in families in museums and how it can support learning (Benjamin, Haden, and Wilkerson, 2010; Crowley and Callanan, 1998; Gutwell and Allen, 2010; Haden, Jant, Hoffman, Marcus, Geddes, and Gaskins, 2014). In addition, there is some evidence that these kinds of interactions of co-constructing meaning between parent and child on the museum floor through joint attention and problem solving support learning better than offering direct instructions about how to do an activity (Friedlieb and Gaskins, 2007; Puchner and Gaskins, n.d.).

Parents have a number of resources for facilitating their children's learning that museums do not have. They know their children's interests, their previous experiences, their developmental level, their knowledge, their fears and hesitations, and ways to motivate them to engage or to sustain their attention. These are many of the things that a good teacher also knows about each student, but that museum staff are not able to have access to, since their visitors are strangers to them. Because they care deeply about their children and want the museum visit to be a success, they are also highly motivated to facilitate their children's experience. When they go home, parents can also extend learning beyond the museum visit, making connections to things that were experienced at the museum and helping children remember and consolidate knowledge and ideas. They therefore have the potential to mediate between a child and the content of an exhibit or program in a way that a museum facilitator or structured activity cannot even approach.

But parents have their limitations as facilitators of their children's learning, as well. If they are not themselves familiar with museums, or feel uncomfortable or out of place, they may not be able to lead their children into engaging in exhibits or be able to accept their role as organizer of the family's experience. If they are not familiar with the particular museum they are visiting, then much of their energy is displaced into managing the visit at the practical level—finding their way around, figuring out what order to see things in, identifying exhibits that are of most interest, thinking about how to obtain food, looking for bathrooms and drinking fountains, pacing the family so that they do not spend too little or too much time on a given exhibit or do not get too tired, etc. They may also have their own personal goals for seeing things in the museum that are in conflict with the things their children want to see, and so they must balance their own desires and patience with those of their children.

Even when a parent is prepared emotionally and psychologically to focus on mediating their children's museum experience, they may find it difficult or inappropriate to do so. For each new exhibit, parents must quickly take in the topic content and the possible entry points, in order to help children get started. They must make a judgment about how the museum content and activities match the interests and abilities of their children and also how much of their guidance is required to allow the child to successfully engage and learn. When exhibits are hard to parse upon entry, or when parents do not understand the content of an exhibit, parents may hold back because they are not sure how to guide the children, and thus by default, they will allow children to initiate and organize engagement (Gaskins, Flores, Gonzalez, and Ursetto, 2007). When an exhibit looks to be within a child's ability to engage independently, a parent may keep some distance and take on the role of being a witness rather than a participant (Gaskins, 2008a; Gaskins, Barbosa, and Obirek, 2007). When an exhibit seems to be beyond the child's ability, a

parent may take over to insure successful engagement (or because the activity is an interesting challenge for the parent!), even if it means marginalizing the child's contribution (Cole and Gaskins, 2007). Parents may prematurely judge content as uninteresting or inaccessible to the child because of gender or age biases, thus limiting a child's exposure to some topics (Crowley, Callanan, Tenenbaum, and Allen, 2001; Friedlieb and Gaskins, 2007). And if exhibits are designed for the use of one person at a time, or there is no comfortable way to sustain proximity to children, parents will also keep some distance, even if their mediation would support their children's learning (Gaskins, 2008a; Gaskins, Barbosa, and Obirek, 2007).

If museums make a commitment to family learning with parents serving as mediators of their children's learning experiences through joint attention and co-constructed meaning, then they need to consider how to best support parents' understanding of content and activities and their engagement with the exhibit. This would include making entry points and themes transparently obvious, constructing activities so that goals and the means to achieve them are easy to figure out (including ways to engage that are easier and harder, so that parents can match the difficulty of the task to their children's levels), and providing information on an "as needed" basis through accessible signage. They also need to consider how to make spaces comfortable for maintaining proximity and shared attention, by making access to components generous enough to support whole families at one time, by providing proximal seating, and by limiting the range of movement of children so that they are not in constant motion. They might also consider how to make activities or components serve as invitations for shared engagement between parents and children through problem solving or actions that require coordination or team work to accomplish successfully.

But museums must also come to terms with the fact that parents are not formal teachers and will not always act the way a museum facilitator or school group leader would, that they will make some mistakes in stating facts or presenting ideas, and that they will undoubtedly miss some of the potential for action and learning built into the exhibit—or even use an exhibit in unintended ways. These "weaknesses" should be given perspective by remembering the strengths that parents also bring by virtue of knowing their own children's interests, knowledge, abilities, and experiences. If the concept of what there is to be learned in a museum visit is expanded beyond the idea of facts and related ideas, to include consolidation of existing knowledge, connections to past (and future) experience, and the formulation of new questions (Falk and Dierking, 2013), then parents are, despite their weaknesses, in the best position to facilitate their children's learning, especially if museums help them by providing direct and efficient access to the resources in each exhibit.

Cultural Differences in Family Learning

In addition to the individual differences in how adults approach their children's learning in museums discussed above, there is also important evidence that illustrates the ways in which parents from different cultural groups may bring different understandings to their task of supporting their children's learning and enjoyment in the museum. From the of other cultures around the world, we know that learning as a process is culturally organized, growing out of shared beliefs about the nature of children, their play and learning, and adults' responsibility for

teaching them or monitoring and evaluating their learning (Lancy, Bock, and Gaskins, 2010; Rogoff, Paradise, Mejía Arauz, Correa-Chávez, and Angelillo, 2003).

As we will see in the evidence presented below, the basic assumptions that were given above about what parents believe and are inclined to do that allow them to mediate their children's learning through playfully co-constructing understanding are generally valid for middle-class European-American visitors. But those assumptions do not hold for all groups of visitors. If museums hold fast to a commitment to supporting parental scaffolding of information from the exhibit and of their children's motivation, then they will be inclined to judge as inadequate any families that work from a different model. If, on the other hand, they study families across the full range of visitors, from different cultural, socioeconomic, and educational backgrounds, they will undoubtedly find that they need to be developing exhibits and programs that support other kinds of models of family engagement, as well, if they are to insure their museum is designed fro all visitors (Gaskins, 2008b).

In this section, a series of research studies will be described which look at families from three distinct cultures in the United States, exploring their understandings about learning and museums and their actual behavior in a children's museum. This sample of three cultures will not provide answers about how all types of visitors might use a museum. Rather, it demonstrates the need for each museum to identify their distinct visitor populations and learn about their underlying beliefs and social habits, and how these affect their use of the museum.

Most of the visitors who visit the Chicago Children's Museum in the United States come from one of three cultures: European-American, African-American, and Latino. These three cultures were therefore chosen to serve as the comparison groups for the series of studies described here. There are other groups that are represented in the city of Chicago and who visit the museum, but none were large enough to merit inclusion in these studies.

(We considered including Korean families as a fourth culture, since there is a large Korean population in the city, but it turned out that attendance at the museum for Korean families is relatively low. I interviewed a Korean mother who served on the Board of Trustees for the museum to understand how she interpreted this pattern of attendance, and she reported that Korean parents in general highly value and actively seek out educational experiences for their children, but they do not recognize the potential for learning in a playful environment like that of the children's museum, so they were not very motivated to visit.)

Developing Models of Family Learning Based on Cultural Beliefs

The first step was to assess parents' beliefs. Interviews were done first of mothers from the three cultural groups outside of the museum setting (Gaskins, 2008b). We were interested in two beliefs in particular: 1) do parents see a relationship between play and learning, and 2) do parents see themselves as active play partners for their children. To assess the first belief, we asked an open-ended question about why they thought children played. We then coded their responses for any evidence of a connection made between play and learning or related concepts, like curiosity and exploration. We found large differences across the three cultural groups in how many mothers thought children played in order to learn. Almost all European-American mothers (81%)

talked about learning when describing why children play. African-American mothers were less likely to make that connection (60%), and Latina mothers were the least likely to do so (45%). (All results reported in this section as showing differences across the three groups are significant at a p-level of .05 or higher.) A shortened version of the interview was subsequently conducted with parents in the museum. The results showed a similar pattern of cultural differences seen in the open-ended interview question above (Gaskins, 2008c).

To assess the second belief, about the role of parents in play, we presented a series of short vignettes about children at play, stopping the story at a point of tension about what might occur next. We then asked the mothers what they thought the mother in the story should do. We coded their responses for whether they answered that they would enter to play either to support it, expand it, or redirect it.). Almost all European-American mothers (79%) indicated that they were inclined to have the mother join in the play of the children in the stories. Of the other two groups, Latina mothers were less likely (49%), and African-American mothers were the least likely (27%).

Note that in these interviews, the differences are one of degree, not of absolute differences. For example, not all European parents connected play with learning (even though most did), and many Latino parents did connect play and learning (even many did not). In the following model of cultural beliefs, such intracultural variation will be suspended in the service of coming up with generalizations that capture general differences between cultures, but it should not be forgotten that they do indeed exist. Also, every effort was made to balance our samples for the three cultural groups for education and income, to be sure that any differences we found were indeed about cultural beliefs, not about socioeconomic conditions. By selecting our samples from a larger pool of families we observed and interviewed, we were able to produce samples that did not differ on income, but Latino parents (many of whom are immigrants) had a slightly lower level of education than parents from the other two groups.

With this data, we constructed a working model of cultural patterns of belief about play, learning, and interaction that help us interpret visitor behavior seen in the children's museum (Gaskins, 2008b). The first two columns of the model report the interview results. The second two columns provide derived expectations of the roles that parents will adopt while visiting exhibits with their children and the styles of interaction they are likely to most comfortable with. Note that the model for the European-American parent is the one that best matches the behavior that is expected from Vygotsky's sociocultural model of co-construction of meaning through playful, scaffolded interaction. For African-Americans, they interpret their children's play as supporting learning, but they are less likely to join in that play, except in those instances where they see an opportunity for direct instruction that they control. Such opportunities would be provided more often in goal-directed activities, where there is clearly a right and wrong answer or a clear marker of success in achieving a specific goal. Latinos have their own pattern of roles and styles. They are the least likely to define children's activity in a museum as learning, but are willing to participate in their children's play. Thus, they see their children's engagement in a museum as an opportunity to enjoy each other's company in pursuit of a shared activity, taking on little responsibility for active teaching, either in the form of scaffolding their children's engagement through conversation or in offering direct instruction.

Cultural Models of Family Learning

	Play=Learning	Adults=Playmates	Adult Role in Museum	Style of Interaction
European-Amer	strong	strong	Help children through play	Child Directed & Collaborative
African-Amer	moderate	low	Watch or Instruct	Adult-Directed
Latino	low	moderate	Have Fun Together	Collaborative

Because they are less focused on teaching, but rather on participation, Latinos are put at the least disadvantage when they are lacking content information relevant to an exhibit. Rather, they engage with exhibits as co-learners, with everyone in the group holding equal status in the quest for information and understanding. This is a particularly interesting point because they tend to have the least education of all the three groups, especially immigrants who may have had limited educational opportunities in their country of origin. Both European-Americans and African-Americans (when they engage as teacher) need more mastery of content if they are to succeed in their goal to support their children's learning by teaching (directly or indirectly).

These cultural models of family learning would also have an impact on the kind of feedback parents are likely to offer. Part of Vygotsky's model of sociocultural learning includes providing motivation to engage and to stay engaged. One would expect, then, to see mostly positive feedback and encouragement from the European-American parents (even when in reality the child has accomplished very little). Since African-American parents are focused on direct instruction of content with right and wrong answers, you would expect them to use both positive feedback and negative feedback, when each is appropriate. Latinos, as equal co-participants, would be expected to use the least amount of feedback, either positive or negative, with most of that being focused on the social dynamics of the group and less focused on the children's accomplishments.

Observational Evidence of Cultural Models of Family Learning in a Museum

My colleagues and I have collected evidence about cultural differences in behavior in the Chicago Children's Museum, both by tracking and observing visitors for their entire museum visit and by modifying exhibits to look for cultural group effects in how they are used under varying conditions.

For the tracking study, we observed 14 families from each of the three cultural groups for their entire visit (Gaskins, 2008c). Each group had a child between the ages of 5-8 years of age that was designated the "target child" (the child that we followed). We recorded many variables, including how long visitors stayed at exhibits, styles of child-caregiver interaction, and the types of dominant activity at each exhibit. We found a wide range of similarities across the three groups that suggest that all the visitors observed found their visit equally interesting and rewarding. The mean length of time of the entire visit, for all groups, was about 2 hours. Within that time, their mean length of time actively engaged in exhibits was about 1¼ hours. The mean

length of visit for an activity was just over 3 minutes, and families visited on average 43 different components. Visitors from all three cultural groups used exhibits as intended almost all of the time (average = 95% of the time). For all three groups, about half of the time the target child was acting independently, and about half the time they were engaged in social interaction with others. For the children in each group, their most frequent type of activity (about half of all their activity) was large motor activity (with movement using the whole body).

It was only when we analyzed the social interaction segments that we found significant cultural differences (Gaskins, 2008b, 2008c). Our model predicted that European-Americans would engage in more child-directed activity than the other two groups, that African-Americans would engage in more adult-directed activity than the other two groups, and the Latinos would engage in more collaborative activity (where neither the child or the adult was consistently determining what the family group would do). The results of our analysis are found in the chart below. Each of these predictions was upheld (even though for all groups, collaborative interaction is the most common type of interaction). European-Americans had more segments of social interaction where the child determined what the family would do than the other two groups, although collaborative interaction was the dominant type of social interaction for this group. Likewise, African-Americans had a higher amount of adult-directed interaction, nearly as common as collaboration. And for Latinos, virtually all of the interaction was collaborative.

Types of Social Interaction by Cultural Group

	Child-Directed	Adult-Directed	Collaborative
European-Amer	16%*	20%	64%
Afro-Amer	2%	43%*	55%
Latino	4%	10%	86%*

* $p < .05$

Moreover, there were differences across groups in how long social interactions of different types lasted (Gaskins, 2008c). For European-Americans, all styles of interaction last same length of time. For African-Americans, child directed segments, which are culturally the least likely, are of shorter duration than adult-directed and collaborative segments. For Hispanic-Americans, collaborative segments, which culturally are the most likely, are longer than either child-directed or adult-directed segments.

Likewise, we compared how long independent engagement segments and social engagement segments lasted as a way of measuring how meaningful social engagement was for each group (Gaskins, 2008c). We found that social engagement segments last longer than independent engagement segments for European-Americans (30 seconds longer) and Latinos (66 seconds longer), but for African-Americans, independent engagement seconds lasted longer than social engagement segments (25 seconds longer). While these times may appear short, it is important to remember that the mean length of time for engagement with a component was only about 3 minutes. So the increase for European-Americans reflects a 16% increase in time spent over the average, for the Latinos a 35% increase, and for the African-Americans, a 13% decrease.

These data looking at length of time spent both in social engagement segments and in types of social engagement are also supportive of the model of cultural differences proposed above. European-Americans find social interaction meaningful in general, and are comfortable with all types of social interaction, including child-directed interaction. African-Americans are relatively independent (with independent engagement segments lasting longer than social ones) and their social interactions are divided between adult-directed and collaborative styles (but not child-directed). Latinos appear to strongly prefer a collaborative style of interaction over child-directed or adult directed interaction, and with such social engagement segments lasting much longer than independent engagement segments.

Experimental Evidence of Cultural Models of Family Learning

To see how these approaches would shape families engagement with specific characteristics of exhibits, we compared European-American and Latino families in a building exhibit where we could manipulate the premise of the exhibit (Gaskins, 2008d). For half of the families in each group, we presented the task as an open-ended building task ("build whatever you want"); for the other half, we gave them a specific goal to build a tall structure ("see how close to the cloud you can get"). Whether or not an activity has a specific goal or not is a major design characteristic. We believe that having a goal has an important impact on family learning, in particular how parents engage. In this case, it is a "relative" goal—rather than an absolute one found in an activity where there was only one "right" answer, so the experimental manipulation is a subtle one. (The exhibit as designed uses the goal present in this experiment; our manipulation was to remove it for half the visitors.) Our prediction is that if the adults are interpreting the task as an opportunity for learning, they will be more likely to engage with a goal-directed activity. But it should have no difference on adult engagement if adults interpret the task as an opportunity to collaborate with no focus on what might be learned. Thus, given our cultural model, we predicted that European-Americans would have a higher level of engagement when a goal is present (compared to their engagement when the activity is open-ended), but that the task structure would have no effect on Latinos. (The prediction for African-Americans, if they had been part of this study, would have been that the amount of joint engagement would increase even more dramatically for goal-directed activity than it would for European-Americans.)

Observing families from each of these two cultures (half with a goal, half with an open-ended activity), we measured how much of the time the adult was jointly on task with the child. For European-Americans, they increased their joint participation when there was a goal (92%) compared to when there was no goal (80%). For Latinos, there was no difference between the two groups (94% with a goal, 90% with no goal). As predicted, European-American adults were more motivated to join in the building activity with their children when there was a goal, while Latinos were highly motivated to join in the building activity with their children whether or not there was a goal.

In a second experiment, my colleagues and I analyzed interviews conducted on the museum floor of a children's museum with parents following their engagement in one of two parts of a building exhibit--an open-ended building activity and a goal directed activity followed by an exercise reflecting on their experience (Gaskins, 2009). To measure their understanding of what children might learn and how parents might participate, we explicitly asked them in the interviews what

they thought their children had learned and whether they had had an active role in the activity. We were interested in knowing the overall effect of participating in the open-ended vs. the goal-directed activity on the parents' perceptions about children's learning and parents' roles, but we were especially curious whether the presence of a goal-directed activity would have the different effects on responses by parents from the three cultural groups.

Overall, parents who participated in the goal directed activity identified more learning skills that those in the open-ended activity (an average of 1.7 vs. 1.2 skills). But that difference was entirely from differences in the responses from African-American (an average of 1.7 vs. 0.9 skills) and Latino parents (2.0 vs 1.2 skills). There was no change for European-American parents (an average of 1.5 vs. 1.3 skills). The goal-directed activity served to make children's learning more salient to both the African-American and Latino groups.

We also coded for mention of STEM skills (Science, Technology, Engineering, and Math) in particular. Overall, the percentage of parents who mentioned a STEM skill was higher for the goal oriented group than the open-ended group (33% vs. 15%). When responses were analyzed by cultural group, we found the only group that differed across the two conditions was Latinos (43% vs. 9%). European-Americans (50% vs. 33%) and African-Americans (8% vs. 0%) showed no difference between the two exhibit types, although the African-American parents were clearly much less likely to talk about STEM skills than parents from the other two groups. Interestingly, the goal-directed activity was particularly helpful in making STEM learning salient for the Latino parents, while it did not effect the European-Americans (who recognized STEM learning in both conditions) nor the African-Americans (who failed to recognize STEM learning in both conditions). (In addition to STEM learning, other types of learning mentioned by parents in all groups included process learning (like learning how to solve problems) and learning how to work together.)

A larger percentage of parents who participated in the goal directed activity also reported that they had taken an active role than those in the open-ended activity (78% vs. 53%). Here, differences were found for European-Americans (75% vs. 47%) and African-Americans (77% vs. 43%)—the two groups that our model would predict would have their understanding of their role affected more when there was a goal. There was no difference for the Latinos (86% vs. 73%)—who had equally high values for both conditions, the group we would predict would not be influenced by the presence of a goal.

In addition to providing more evidence for the validity of the cultural model of family learning presented here, these experiments demonstrate the value of analyzing visitor experience and understanding by cultural group. If these observational and interview results had not been broken down by cultural group, there would be a much less informative set of data points to interpret about the effect of a goal directed activity on parental engagement and on their understanding of museum learning and parental roles. Each of the effects was culturally shaped. When an overall difference was found, it turned out only for one or two of the cultural groups contributed to that difference, not all of them. The effect of a goal-directed activity on visitor behavior and understanding was dependent on the cultural model of family learning that the visitor held.

Conclusions about Family Learning

When a museum makes a commitment to supporting the children's learning in family groups, they also need to make a commitment to understanding more fully what families expect from their visit and how families organize their social interaction. The most accepted model of social learning in museums is a sociocultural one, build on the theory of Vygotsky, which emphasizes the co-construction of meaning through conversation. It also emphasizes that parents (and others who know more) verbally mediate children's learning by working together in the "Zone of Proximal Development," that is, just beyond what children can understand on their own. Parents bring a great deal of knowledge about their children to the museum encounter. They need the help of the museum to allow them to understand the content of exhibits and the potential ways of engaging with that content, so that their mediation can be effective. Studying visitors' joint attention, collaborative actions, and conversations can help museums understand how well their exhibits and programs are serving families' social learning.

This model of parental scaffolding in support of children's learning assumes that parents will share with the museum a number of commitments--that they understand that play can lead to learning, they see themselves as active play partners, and they commit to mediating their children's play to maximize what the children will learn. Because this model largely matches the understandings of European-American parents about play, learning, and social roles, many of the visitors that come to museums act in the way that museums expect families to act.

But our research demonstrates that not all visitors will be working with the same model of family learning. We have shown that for two cultural groups, African-Americans and Latinos, their model of family learning is significantly different from that of the museum. While they may share with more traditional museum visitors the expectation of experiencing novel, interesting, and fun activities during their museum visit, they bring with them cultural understandings about how children learn and their role in that learning that will lead them to interact in ways that are at odds with the expectations of the museum.

When families do not display the kind of behavior the museum expects them to, museum staff are often judgmental. Not recognizing that there can be more than one cultural model for how families learn, the staff's first inclination is to "teach" parents and children how they "should" act in their museum. But families do not act as they do simply out of ignorance (although some families may not be as used to attending museums as others). Rather, their behavior is organized by cultural models that are habitual and complex; they can not be changed by a brief orientation or signage throughout the museum. More importantly, these visitors do not want to change the ways they are used to interacting together. They value their cultural understandings; they enjoy experiencing the museum through the lens they are used to.

Rather that trying to change visitor behavior, museums should put their effort into understanding more about the cultural models of family learning that different groups of visitors bring to the museum and how they affect visitors' engagement with the exhibits and programs offered by the museum. Then, they can use that knowledge to design (or redesign!) their museum experiences in ways that support a broader range of ways of interacting and learning. The cultural differences found in this research would suggest the following. Information should be presented in ways that

are sometimes directly content driven and sometimes exploratory. Some activities should be open-ended, some goal-oriented. Experiences should be available to individuals (of varying ages) and to groups working together (including large groups). The physical space should provide proximal seating for parents who want to collaborate or teach, but also provide distal seating for those who want to observe or witness.

With other cultural groups, in other cultures, researchers might identify additional factors that should be incorporated into museum experiences. The more we know about the different ways that families learn together, the richer and more diverse avenues will be identified for designing museums to support children learning with their families. In the process, as museums become more diverse, and therefore more inclusive, they will become richer and more complex learning environments and more valuable for *all* visitors.

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