PARENTAL SCAFFOLDING:
A CASE STUDY OF LOW-INCOME FAMILIES AT A CHILDREN’S MUSEUM

BY
WASANA SRIPRACHYA-ANUNT

DISSERTATION

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Doctoral Committee:

Assistant Professor Laura J. Hetrick, Chair
Professor Robert E. Stake
Professor Lisa Rosenthal
Assistant Professor Stephanie C. Smith
Associate Professor Elizabeth Wood, Indiana University-Purdue University Indianapolis
ABSTRACT

This study examines scaffolding behaviors that low-income parents used in a children’s museum. The primary research question is “How might low-income parents scaffold their preschool-aged children in an early childhood exhibition in a children’s museum?” with a supporting question of “How is parental scaffolding facilitated or constrained by the exhibit environment and the interpretive programs?” Drawing upon the case study method, the Playscape at the Children’s Museum of Indianapolis was selected as the intrinsic and instrumental case of the study. The study involved interviews and naturalistic observations with the museum staff and twelve dyads of low-income, who were members of the Access Pass program in Indianapolis. In addition, three families made repeated visits to the Playscape within 5 months from the first visit and participated in in-depth interviews regarding their museum experiences. The findings show that the low-income parents used scaffolding behaviors with their children at the exhibit areas where problem-solving tasks were explicitly pre-defined. More importantly, they used a wide range of learning and skill-enhancing behaviors to instill school readiness skills, particularly language development, early literacy, social skills, and general knowledge. The results also reveal that parents’ agendas and the perceptions of their roles and children’s learning differed from the museum staff’s expectations of the parental roles in the exhibition and their goal of increasing parental involvement in children’s play.

Keywords: Parental scaffolding, scaffolding, preschoolers, parental involvement, children’s museum, early childhood education
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CHAPTER 1
INTRODUCTION

Early childhood is a critical period for physical, emotional, and cognitive development. As income inequality increases and the opportunity gap widens, more and more children lack early learning opportunities and educational resources. The Institute of Museum and Library Services (2013) calls for museums to provide equal learning experiences for all children. Children’s museums often serve as an entry point for families and young children of all backgrounds to engage in rich learning experiences. Yet, only a few studies have investigated learning experiences of low-income families in museum settings. This study aims to gain a better understanding of how low-income parents might scaffold their young children in a children’s museum.

Background of the Problem

Many children’s museums have increasingly shifted their focus from children’s learning to family learning and thus promoted parental involvement in children’s learning experiences in the museums (Wolf & Wood, 2012; Wood & Wolf, 2010). The family-centered perspective is grounded in Vygotsky’s sociocultural theory, which regards learning as a social process. Vygotsky (1978) coined the term “zone of proximal development (ZPD)” to explain how social interactions with adults or knowledgeable peers help a child advance to his potential level of development (Vygotsky, 1978). Based on the same notion of mediated learning, Wood, Bruner, and Ross (1976) introduced the term “scaffolding” to describe the tutorial process in which an adult controls the structure of the problem and prepares the environment that matches the capability and knowledge of the child. The level of adult involvement gradually diminishes as
the child takes more responsibility and control over the task. In the family learning approach, museum educators and designers encourage parents to take on the role of a facilitator and scaffold children’s learning in the exhibit space.

In fact, the role of parents as facilitating teachers is not a new concept. Learning takes place long before children enter school (Vygotsky, 1978). In the early years, parents serve as the primary socializing agents for young children. The perceived role of parents is to enable children to acquire values and skills necessary to function effectively in society (Grolnick, Deci, & Ryan, 1997). Since most parents are aware of their child’s existing knowledge, they are likely to structure the learning context that is compatible with the child’s level of development, prior knowledge, and interests (Rogoff & Gardner, 1984; Wolf & Wood, 2012). In addition, numerous empirical studies (i.e. Hammond et al., 2012; Puchner, Raporort, and Gaskin, 2001; Wood et al., 1976) mostly conducted in laboratory settings, also found positive effects of parental involvement on children’s learning. Consequently, museum professionals have been receptive to the findings and promote parental involvement in children’s activities based on the predominant assumption that children are more likely to learn when the parents are highly involved in the activity and scaffold the children during play events.

**Statement of the Problem**

The learning stance dictates how museum professionals plan and deliver educational programs as well as design exhibit components (Wolf & Wood, 2012). Such a view that intends to increase parental involvement in children’s play disregards not only different purposes of museum visits but also the fact that families of different cultural backgrounds may have different styles of parenting (Porter & Cohen, 2012) and different perceptions of play and learning (Gaskins, 2008). Although the majority of U.S. museum visitors are white middle class (Farrell
& Medvedeva, 2010; Reach Advisors, 2010B), many children’s museums have joined hands and developed a program, called Museums for All, to make high-quality learning in museums accessible to the underserved communities (IMLS, 2014). Consequently, it is vital for the museums to accommodate the needs and agenda of these families, whose views on the role of parents in children’s play and learning may differ from those of the white middle class.

Beaumont (2006) found that there was an implicit understanding among museum professionals that parents who brought children to museums were at least college graduates. She suggested that a high level of educational attainment helped explain member mothers’ knowledge of learning theories and child development. Nonetheless, Beaumont also cautioned the generalizability of her findings to other groups of family visitors. She suggested a need to conduct a study with other ethnic groups, who may have culturally different child rearing practices.

**Definition of Key Terms**

*Scaffolding* was introduced in the tutor-tutee scenario, where one single task is predefined. Wood, Bruner, and Ross (1976) defined it as an act of “‘controlling’ those elements of the task that are initially beyond the learner’s capacity, thus permitting him to concentrate upon and complete only those elements that are within his range of competence” (p. 90). This definition is often used in predefined problem solving tasks with a close-ended outcome such as puzzles, block building, and word or numerical problems.

*Parents* in this study refer to adult caregivers aged 18 years old or above, who accompany children to the museum. Adult caregivers include parents, stepparents, grandparents, nannies, siblings, and relatives.
Interpreter or facilitator are terms that the Children’s Museum of Indianapolis refers to floor staff, who have direct contact with family visitors. Their job is “[to provide] the highest quality immersive and interactive experiences for children and families” (TCM, 2013). In addition to delivering daily programs at specific times, interpreters are present throughout the exhibit areas in order to play alongside children and scaffold their learning as well as model for parents some scaffolding strategies that they can use with their children.

**Research Questions**

Little is known about how young children living in homes with limited educational resources are supported by parents toward the conceptualization of critical skills for school readiness in museum settings. The objective of this study is to expand knowledge of family visitors to include an underserved group who, without some types of assistance, have limited access to high-quality educational experiences such as those in a children’s museum. This study focuses on the notion of parental scaffolding in a museum setting. The primary research question that guides the study is: How might low-income parents scaffold their preschool-aged children in an early childhood exhibition in a children’s museum?

To capture the complexity of parental scaffolding, the physical environment and the perceptions of the museum staff, who were involved in the design of the exhibition and the program delivery are also examined in conjunction with the primary research question. This leads to a supporting research question of “How is parental scaffolding facilitated or constrained by the exhibit environment and the interpretive programs in the early childhood exhibition?”

**Significance of the Study**

Low-income families are an underserved and understudied population in museum education. Samples of previous studies (such as Acosta, 1997; Beaumont, 2006; Downey,
Krantz, & Skidmore, 2010) were predominantly white middle-class. Most participants in the literature (such as Beaumont, 2006; Gallagher & Dockser, 1987; Grove, 2012; Puchner et al., 2001) were either museum members or general visitors who visited museums during general operating hours and presumably can afford to pay full-priced admission, which range from $9.50 at the Minnesota Children’s Museum to $18.50 at the Children’s Museum of Indianapolis. Major children’s museums such as TCM, Boston Children’s Museum, Chicago Children’s Museum, Please Touch Museum, and Minnesota Children’s Museum have been offering discounted or free admission to low-income populations to ensure access to these high-quality learning resources. However, there have been only a few studies that look specifically at parental scaffolding in low-income families. This study provides an insight into this group of family visitors so that museum educators and exhibit developers can design and provide supports that can further enrich their experiences at the museum and better meet the needs of these low-income parents.

**Parameters of the Study**

The study was conducted in an early childhood exhibition called *Playscape* at The Children’s Museum of Indianapolis (TCM). The Playscape is designed for families with children aged five years old and under. It was closed for renovation at the end of 2012 and was reopened to the public on August 31, 2013. The new 8,447-square-foot Playscape consists of four exhibit spaces: Babyscape, Art and Music Studios, Invented World, and Natural World. The guiding principles of the new Playscape are (1) to encourage children to learn through play, (2) to encourage parents or adult caregivers to play with the child, and (3) to support child-directed play (TCM, 2011).

The study was comprised of two groups of participants: one was the family visitors in the Access Pass program, who have children aged 3 – 5 years old; and the other was TCM staff
members including the Playscape designer, the director of early childhood education, the early childhood specialist and interpreters in Playscape. Although the focus of the study was parental scaffolding in low-income families, I sought more than one group of participants in order to gain a complete understanding of the notion of parental scaffolding in the museum.

Using a progressive sampling technique, I purposefully selected 3 dyads out of the initial twelve families for extensive interviews and observations. I invited them to make at least one repeated visit to the Playscape within 5 months in order to observe how parental scaffolding may evolve as a result of repeated visits and familiarity with the space and me, the researcher.

**Research Design**

The study was grounded in constructivism, which regards knowledge as being socially constructed and culturally specific (Schwandt, 2003) and therefore values multiple truths. I employed a case study method to gain an in-depth understanding of scaffolding behaviors that low-income parents use with their children in a children’s museum. I selected Playscape as the case study, because of its design intention to encourage parental involvement and thus providing an ideal scenario for me to study parental scaffolding. The study includes interviews and naturalistic observation with museum staff members and low-income families. I recruited 12 parent-child dyads for initial observations and interviews. After that I used a progressive sampling technique to select 3 families for further investigations on the rationale of their behaviors and the patterns of parental involvement.

**Research Procedure**

The study was composed of three phases of data collection. In the first phase of the study, I conducted semi-structured interviews with the museum staff members to learn more about the development and design of the new Playscape, their interpretation and expectation of parental
scaffolding, and the new interpretive approach *Powerful Interactions* employed in the new Playscape. In addition, I also observed the interpreters performing Powerful Interactions in Playscape to gain a better understanding of its practical implementation.

The second phase of the study involved naturalistic observation of family visitors in Playscape. Participants were asked to attach small voice recorders onto their clothing in order to document their verbal interactions. In addition, I observed, tracked their locations, and documented their non-verbal interactions, which included, but not limited to, pointing, touching exhibit elements, or demonstrating, and also any interaction they may have with the interpreters. When the dyad left the Playscape, I asked the parents to fill in a Playscape questionnaire and participate in a semi-structured interview regarding their scaffolding behaviors in Playscape. The interviews were also recorded.

The last phase of data collection involved progressive focusing (Parlett and Hamilton, 1972, cited in Hamilton, 2005; Stake, n.d.), in which I selected 3 families from the initial twelve families and invited them to make at least one more visit with their child to the Playscape. The procedure resembled that in the second phase, in which the families visited the Playscape and then participated in a brief semi-structured interview. The interview questions were adjusted to gain more information about their experiences in repeated visits.

Interview and observation data were transcribed and then coded in order to look for characteristics and patterns of parental scaffolding. In addition, I included vignettes to illustrate each scaffolding behavior and to provide a vicarious experience to the reader to increase the possible transferability of the results.

**Chapter Summary**

Early childhood is a critical period for skill acquisition and habit formation. Children’s museums serve as high-quality learning resources for families of all ages and backgrounds.
Many museums have increasingly acknowledged learning as a social process, in which parents serve as the primary socializing agents for children, and adjusted the design and delivery of their educational programs to encourage parental involvement in children’s activities in response to positive effects of parental involvement on children’s learning found in numerous empirical studies.

However, little is known about supports that low-income parents use with their children in museum settings. The study involved interviews with TCM staff members as well as observations and interviews with the Access Pass families in Playscape exhibition. This study aimed to not only advance research in museum education, but also give museum professionals insights into the needs of low-income parents so that museums can better support them in helping their children learn. In the next chapter, I review the existing literature in the field of early childhood education, learning theories, and museum education.
CHAPTER 2
LITERATURE REVIEW

The essence of a museum originally relied on the authenticity of its collection. In the late 19th century, the object-based epistemology guided the creation of museums. There was a widely accepted belief in the United States that objects represented facts and therefore are sources of knowledge (Conn, 1998). The 19th-century museums were used as an instrument for the elite to educate and regulate the working and middle class (Bennett, 1999; Conn, 1998). The new standards of the criteria for accreditation set by the American Alliance of Museums (formerly the American Association of Museums) reinforce the importance of educational service (Ellenbogen, 2002; AAM, 2004). In response to the AAM, museums have conducted numerous visitor studies and developed educational programs that respond beyond the needs of a group of scholars to the general public. Knowledge, as Hooper-Greenhill (1992) suggested, has become the commodity that the public expected to receive from a museum visit.

In this chapter, I review the literature from the second half of the 20th century to the present primarily in the fields of museum education and educational psychology in order to lay a foundation to examine the effects of parental scaffolding on young children’s problem solving in a participatory contextual exhibit. I first discuss a shift in museum educational goal from a child-centered to a family-centered perspective. Then I review the works of two influential figures in child development, Jean Piaget and Lev Vygotsky, and consider their views on the impacts of social interaction on cognitive development in early childhood. Finally, I examine more recent studies of parental scaffolding in museum settings and the mismatch between the museum staff’s
cultural understanding of parental roles and the parents’ perceptions of their role in children’s play and learning.

**Learning Opportunities for Preschoolers**

Families from elite backgrounds tend to participate in institutions serving the elite, and families in poverty tend to be involved with institutions serving the poor. Some institutional settings—zoos, parades, certain stores, and, sometimes, public transportation—are “great equalizers,” drawing families of all kinds. This kind of mingling of rich and poor is relatively unusual, however. (Lareau, 2003, p. 15)

Informal learning opportunities in most communities are designed in response to the needs of school-aged children. There are fewer opportunities for other age groups, one of which is the preschool age range. Early childhood is a critical period for learning and habit cultivation. Acknowledging the significance of early learning, the Obama Administration awarded the $500 million Race to the Top-Early Learning Challenge grants for early education reform to nine states in December 2011 and urged other states to apply for the funding in 2012. “What happens in early childhood sets the stage for everything that follows in life,” stated Health and Human Services Secretary Kathleen Sebelius (U.S. Department of Education, 2012). Museums, as public institutions, are also responsible in providing quality educative experiences for young children before they enter a formal schooling system (Shaffer, 2012).

Falk and Dierking (2002) advocated for museum professionals and other community program organizers to provide equal access of free-choice learning to all age groups. They reasoned that “[u]nder the best circumstances, it is during early childhood that people develop the foundation for lifelong learning skills that will enable them to travel safely, joyfully, and competently throughout a lifetime of learning” (p. 64). In addition to the benefits of skill acquisition, Wilkening and Chung’s (2009) interviews with 110 young adult museum lovers
show that visitors who had a positive memory of museums from childhood developed a lifelong interest in museums.

In response, many museums are contributing to early childhood learning. Betsy Bowers (2012), Deputy Director of Collaborations, Partnerships and Consulting at the Smithsonian Early Enrichment Center, conducted an online exploratory survey on a museum educator listserv. Nearly half of the respondents were art museum educators. Eighty-eight percent of the 69 respondents stated that they offered programs for children younger than kindergarten age. They indicated that primary challenges are the limited number of staff and the time-consuming preparation for hands-on and individualized learning for young children and parents. They also addressed a need to create a platform, in which museum educators could exchange ideas about early childhood learning in museums.

**From Children to Families**

Children’s museums, zoos, and aquariums could be considered as leaders in informal early childhood education. The Boston Children’s Museum aimed to create a learning environment that empowered children to explore and believe in their own choices. Gail Ringel (2005), the vice president of exhibits and production at the Boston Children’s Museum, explained that the museum believed in the child-centered approach to an extent that “[t]he staff people are trained to discourage parents from butting in and doing the project . . . [in order to let parents] know that it’s up to the child to guide his or her own activity” (p. 2). The museum staff increasingly recognized family as a learning unit. Nonetheless, they maintained an emphasis on listening to children’s voices.

While many museums are designing programs geared toward the needs of young children, leading children’s museums such as the Children’s Museum of Indianapolis called
attention to an obvious fact that children visit a museum with parents or adults (Wolf & Wood, 2012), who usually decide how children should spend their leisure time (Kelly, 2000; Wilkening & Chung, 2009). Children themselves also view the presence of their family members as an important element of the museum visits (Dockett, Main, & Kelly, 2011). Children appear to be less anxious and more eager to explore new environments when the adult is present in the room with them (Hutt, 1966).

In addition, Project Explore, a collaborative effort between Please Touch Museum in Philadelphia and Harvard’s Project Zero in Cambridge, also found that adults’ use of open-ended questions enhanced children’s learning in the museum environment (Haas, 1997). As a result, museums are shifting their focus from child-centered to family-centered learning. “In using child-centered approaches museum professionals realized that they were overlooking the adults as critical members of the learning cohort and that incorporating parents into the learning event offered the potential to expand children’s experiences beyond the museum” (Wolf & Wood, 2012, p. 30). Museums have increasingly realized that they need to make the exhibits inviting and enjoyable for adults as well as children if they want to increase adult engagement in children’s activities.

Along with children’s museums and other informal learning organizations, art museums have increasingly created family-friendly spaces and programs in addition to their traditional “no-touch” art gallery experiences. Edwards (2005), education specialist for family audiences at the J. Paul Getty Museum, described that the Getty Museum renovated the Family Room in order to better accommodate the needs and interests of family audiences. The redesign took families’ priorities into consideration: “(1) hands-on activity and opportunities to touch, (2) things to do that are fun and entertaining, (3) self-directed activities for learning about art, and (4) a place to
rest, relax, and ‘let off steam’” (p. 2) with an educational goal of connecting family experiences with the permanent collections. Similarly, the Art Institute of Chicago offers a variety of family programs for children of different age groups. Guided *Stroller Tours*, for example, are designed for families with children aged 18 months and younger (Wolf & Wood, 2012). Besides the hands-on experience, museums increase adult participation by designing multigenerational, physically and cognitively multileveled exhibits that appeal to adults as well as children (Edwards, 2005).

**Family Agenda for Museum Visits**

Social roles and immediate relationships are among several crucial factors that influence how people choose to spend their leisure time (Kelly, 1978). “[F]amily activities were to be motivated by an individual’s perceived role, such as what it takes to be a good father or mother” (Falk, 2009, p. 46). Falk (2009) suggested that visitors entered a museum with specific needs and expectations shaped by their identity-related visit motivations. Parents, for example, often fall into the Facilitator identity category. Facilitators visit a museum “with a strong desire to support what’s best for their loved one or companion” (p. 221). The results of national surveys with museum visitors affirm Falk’s theory of identity-related motivations of parents. The survey shows that mothers usually look for child-friendly exhibits, which, at least they know, are designed for children to increase the likelihood that their children would enjoy and learn something at the museums (Wilkening & Chung, 2009). As a result, “[their] favorite museums to visit are children’s museums, zoos and aquariums, and science centers . . . [and they are] also more likely to visit natural history museums” (Wilkening, 2011, p. 35). In addition, the 2010 survey of museum visitors also shows that the largest segment of moms visited museums for their children’s learning opportunities (Wilkening, 2011). In other words, the interests of their
children override those of the parents. Mothers in the national survey valued museums as good learning resources for their children. One mother even called museums “a necessary evil,” where she felt compelled to bring her children for their benefits (Wilkening, 2011, p. 33). Learning appeared to be at the top of the list of the parents’ agenda for museum visits.

Despite the fact that most families share a goal of learning, family interactions and museum experiences of one family might look totally different from another depending on many factors such as “[parents’] personalities, relationship with their child, experience at the museum, as well as perceived context and desired outcomes” (Dockser, 1989, p. 313). In a case study of seven mother-child dyads at the Children’s Discovery Museum, Dockser (1989) found that these factors influenced how mothers reacted and participated in children’s activities. According to mothers’ explanations of their behaviors during the museum visits, Dockser identified 13 maternal roles, four of which are mother as visit facilitator, learning enhancer, vocabulary supplier, and promoter of positive self-esteem and independence. The aims of these four roles are to develop skillsets and facilitate learning. Therefore, they require mothers’ understanding of the child’s level of development, prior knowledge, and interests in order to scaffold the child accordingly. Since the notion of scaffolding is central to this research and children’s learning experiences in family-oriented museums, I discuss sociocultural theories of child development including scaffolding and the effects of parental scaffolding on children’s cognitive development from previous studies in the next section.

Effects of Parental Scaffolding on Cognitive Development

Ellenbogen, Luke, and Dierking’s (2007) review of literature published since the late 1980s confirmed the shift in the theoretical perspectives of museum professionals on family learning. They recognized family as “a learning institution within the larger learning
infrastructure they inhabit, and the culture in which they function” (p. S53). Parents play an important role in socializing their child to new knowledge and cultural norms of the society they live in (Falk & Dierking, 2002). Social interaction is vital for the construction of knowledge and cognitive development in young children. In this section, I examine social influences on cognitive development through the views of Piaget and Vygotsky.

**Social Influences on Cognitive Development**

Jean Piaget, a Swiss developmental psychologist who was well known for his stage theory, perceived social interactions as a prerequisite for cognitive development in young children. Piaget (1976) asserted, “social life affects intelligence through the three media of language (signs), the content of interaction (intellectual values) and rules imposed on thought (collective logical or pre-logical norms)” (p. 156). He suggested that the acquisition of language enabled children to converse intelligibly and served as the starting point of a “socialization of intelligence” with others. However, Piaget strongly believes that learning is an internal process that requires some changes in the mental structures of the learner.

On the other hand, Vygotsky, a Russian psychologist and a contemporary of Piaget, put a stronger emphasis on social environments. Vygotsky (1987) regarded learning as a product of social interactions. He viewed the communicative ability and understanding of sign systems as the basis for intellectual development that distinguishes humans from animals. Despite their conflicting views, both Piaget and Vygotsky agreed on the importance of language on cognitive development. I therefore discuss how children’s use of language relates to the intellectual growth by examining children’s private speech, which refers to self-talk, before proceeding to the use of language in social interactions.
Language as a self-guiding tool. Children at the beginning of their language acquisition often talk to themselves. Piaget (1959) termed this kind of behavior as egocentric speech, which is a common characteristic of children who are in the pre-operational stage. The egocentric speech reflects the child’s inability to understand that another person might have a different perspective. Consequently, he or she fails to adjust his or her speech to the point of view of the listener, for example, when a three-year-old boy was asked about his weekend, he might reply, “Sarah (the babysitter) helped me build a cave.” He did not realize that the adult stranger had no clues who Sarah was and might not understand that the cave meant a pretend cave made out of a blanket and chairs. Moreover, preschool-aged children often say something to no specific audience, for example, children talk aloud while they are drawing or building things.

Egocentric speech is closely linked with socialized speech. Children talk to objects, animals, or themselves as if they are interacting with another human being. Unlike, Piaget, Vygotsky (1987) perceived such speech in a more positive light and called it private speech. In his observation, children increasingly used private speech as they encountered difficult tasks. When a child was given a challenging task, she often began with socialized speech by asking adults for help. In a case that assistance was not available for the child, she first described the situation aloud and then verbally guided herself step-by-step through her thinking process and behaviors. Vygotsky (1987) concluded, “Children solve practical tasks with the help of their speech, as well as their eyes, and hands” (p. 26). Berk, Mann, and Ogan (2006) also found an increase in children’s use of self-directed speech as they tried to work out the storyline of their pretend characters in make-believe play. Children aged between 2.5 and 6 years old engaged

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1 The pre-operational stage encompasses the period in which the use of language emerges to the ages of 7 – 8 years old. Pre-operational children are not able to communicate their thoughts until they are between 7 and 8 years old, when egocentric speech is about 25% (Piaget, 1959; 1976).
more in make-believe play and used private speech more frequently than children in other age groups. In addition, Berk et al. (2006) also found that the rate of private speech remained high throughout that age range.

Private speech has an instrumental function (Bruner, 1985). According to Vygotsky (1978), the benefits of private speech are threefold. First, private speech enables children to think of different possible solutions beyond their immediate sight. Second, children who use self-directed speech plan a solution before executing an action. Lastly, children, with the aid of speech, can better control their behavior and develop self-regulatory skills. As children become more competent in their use of language and engage more in socialized speech with adults and peers, they begin to expand their knowledge of social rules and moral values (Piaget, 1976).

Repeated exposure of social interaction also plays a role in children’s cognitive development. In the next section I examine the role of social interaction on learning through the developmental constructivist perspective of Piaget and the social constructivist view of Vygotsky.

**Learning through social conflicts.** According to Piaget’s (1976, 1995) stage theory, preoperational children have not yet formed a logical mind. They simply imitate and follow adults’ suggestions. It is not until children reach the concrete operations (from 7 to 11 years old) that they overcome egocentrism due to an increasing amount of peer interaction (Crain, 2011). “Thus, [the child] becomes capable of discussion (and of the sort of internalized discussion with himself that is reflection), of collaboration, and of ordered expositions that a listener can understand” (Piaget, 1995, p. 144). Cooperation is an essential factor for cognitive development, because it enables children to work with others and gives them an opportunity to experience different points of view and to exchange thoughts. Piaget (1995) strongly believed that learning takes place only in a presence of social conflicts.
Based on the constructivist view, Piaget (1976, 1995) postulated that children create their own knowledge. When children encounter social conflicts, they need to reevaluate their own perspective and restructure their reasoning. They go through the processes of assimilation and accommodation in order to make sense of the new information. Bell, Grossen, and Perret-Clermont (1985) elaborated on the importance of sociocognitive conflicts that the child’s cognitive growth was evident even though the counterargument of his or her partner was incorrect and a correct solution was not presented to the child during the process of social confrontation. On the other hand, the child showed no cognitive progress in a situation in which he or she simply agreed to the opposing view of another individual. A mere imitation does not lead to learning.

Coming from a social constructivist point of view, Vygotsky (1978) disagreed with Piaget’s view of imitation in learning. He believed that a child has at least two levels of development: (1) the actual level of development, which refers to abilities that have already matured, and (2) the potential level of development, which is the upper bound of the child’s developmental level that is in a process of maturation. He suggested from other studies of his time that children can only imitate within their actual level of development. Yet, imitation under the guidance of adults can help children progress through their maturation process at an accelerated rate. Although both Piaget and Vygotsky shared a similar view that social factors influence learning, they held a different view in how learning should occur. Piaget believed that adults should provide instruction that is appropriate to the developmental level of the child. Vygotsky (1978) criticized instruction based on a developmental theory stating that “[t]his procedure oriented learning toward yesterday’s development, toward developmental stages already completed” (p. 89). He advocated for adults to aim for instruction that will advance
children’s development and help children reach the zone of proximal development. This concept is discussed in the next section.

**Zone of proximal development and scaffolding.** Having worked with cognitively impaired children, Vygotsky (1978) believed that educational intervention can help these children achieve cognitive skills that are beyond their own capability. He claimed that the same stance was applicable to normally-developed children and that instruction can expedite child development. Vygotsky introduced the concept of the zone of proximal development (ZPD), which was defined as a gap between the actual level of development that a child can solve problems on his or her own with already matured abilities and the potential level of development that the child can solve problems with assistance from adults or knowledgeable peers.

The concept of internalization lies at the heart of the ZPD. Vygotsky (1978) viewed learning as a social process in which a child internalized external knowledge and abilities. In his short life, Vygotsky did not elaborate on the concept of the ZPD (Lambert & Clyde, 2003). Yet, Brown and Ferrara (1985) described the ZPD in a practical situation that

first the adult or knowledgeable peer controls and guides the child’s activity, but
gradually the adult and the child come to share the problem-solving functions, with the child taking initiative and the adult correcting and guiding when she falters. Finally, the adult cedes control to the child and functions primarily as a supportive and sympathetic audience. (pp. 281-282)

The role of the adult partner is gradually minimized as the child begins to take charge of his or her own learning. However, it was unclear how the adult should control and guide the child’s learning.
Based on the same notion of mediated learning, Wood, Bruner, and Ross (1976) introduced the term scaffolding to describe the tutorial process in problem solving tasks. Wood et al. gave a similar description of the diminishing role of the adult tutor in the learning process as stated in Brown and Ferrara (1985). However, Wood et al. (1976) elaborated that “[t]his scaffolding consists essentially of the adult ‘controlling’ those elements of the task that are initially beyond the learner’s capacity, thus permitting him to concentrate upon and complete only those elements that are within his range of competence” (p. 90). Such controlling involves simplification of the task and reducing excess alternatives to help the child focus on the acquisition of skills that are within his grasp.

Having some shared attributes, the ZPD and scaffolding are often used interchangeably among early childhood educators and researchers. Lambert and Clyde (2003), however, argued that the distinction between the two concepts lies in Wood et al.’s explicit phrases that “elements that are within his range of competence” (p. 90). Thus, scaffolding focuses on mastering skills in the actual level of development, whereas instruction in the ZPD aims for the potential level of development. I disagree with Lambert and Clyde’s partial interpretation of scaffolding. According to Wood et al.’s (1976) statement above, the tasks consist of elements that are initially beyond the child’s capacity and those that are within his capabilities. The tutor needs to control the focus of the child on the latter at the beginning of the problem solving process so that the child can build on his matured capabilities in order to acquire skills that are initially beyond his capacity, but will be within his capacity after the tutorial session. Moreover, the phrase of “within his range of competence” (Wood et al., 1976, p. 90) entails both the actual level and the potential level of development. Although Vygotsky (1978) identified that a child can achieve the potential level of development through mediated learning, he also acknowledged that the child
could only reach a certain level of development due to the limitation of his or her biological maturation. As a result, from this point onward I use the term scaffolding in a sense that aligns with the ZPD, which aims to advance the child to his potential level of development.

In addition to the clarification of the adult’s role in mediated learning, Wood et al. (1976) showed that the child’s responses to tutoring also influence instruction. Wood et al. investigated the scaffolding function of the tutor with children aged 3 – 5 years old in a block construction task. They categorized children’s responses into three types. In the first category, the child ignored the tutor and continued with his play. In the second category, the child took over the task and manipulated it differently. Lastly, the child followed the tutor’s method and proceeded accordingly. They found that the 3-year-olds tended to fall into the first two categories whereas older children willingly followed the tutor’s directions. Consequently, the tutor needed to intervene more with the youngest group in order to entice them to work on the task.

The study shows that the role of the tutor goes beyond imparting technical knowledge and encompasses other functions such as engaging and maintaining the child’s attention to adhere to the task as well as minimizing the child’s frustration. These key functions require the tutor to have a deep understanding of not only the complexity of the task, but also the capacity of the child. Although the ZPD and scaffolding are originally intended for the context of school instruction and tutoring, their implications can also be applied to parent-child interaction. The effects of parental scaffolding on cognitive development in early childhood are the focus of the next section.

Effects of Parental Scaffolding on Cognition

Scaffolding takes place long before children enter school. Vygotsky (1978) acknowledged that children acquire speech, numerical concepts, and other skills before they
receive formal education. Parents, as socializing agents, play an important role in children’s skill acquisition in their early years. For example, parents facilitate the infant’s language acquisition by using repetitive words and supporting their verbal interactions with gestures (Rogoff, Malkin, & Gilbride, 1984). Senechal and LeFevre (2002) also found that parents’ storybook reading in early childhood predicts the development of vocabulary and listening comprehension skills in Grade 3.

Previous research has shown positive correlations between adult scaffolding and child development. Wood et al. (1976) pointed out that the benefits of scaffolding went beyond the completion of high-level tasks. Children, in fact, benefited more from the process, in which they came to “recognize the relation between means and ends” (p. 90). They must be able to identify a solution to a particular problem in order to accomplish the task without adult assistance. Thus, the goal of scaffolding was to help the novice develop skills that would enable him or her to work on a relatively difficult task independently.

In a recent study based on a social relational perspective\(^2\), Hammond, Müller, Carpendale, Bibok, and Liebermann-Finestone (2012) used a ring puzzle task to study parental scaffolding. At age 2 years old, children were first asked to solve the first ring of the Ring Puzzle task and parents were then instructed to help the child solve the rest of the puzzle. When children were 3 years old, the experimenter demonstrated how to solve the first ring and then asked both the child and parent to jointly solve the rest. They found an indirect effect of parental scaffolding

\(^2\) In contrast with the developmental approach, which posits that the development of executive function (EF) is the result of maturation, the social relational approach acknowledges both social and biological influences on the development of EF (Hammond et al., 2012).
of children’s problem solving at 2 years old on the development of executive function\(^3\) (EF) at 4 years old. The results showed that scaffolding increased children’s use of self-directed speech, which then improved EF at age 4. Nonetheless, there was a significant direct effect of parental scaffolding at 3 years old on EF at age 4.

Azmitia and Perlmutter (1989) pointed out that the limitation of Vygotsky’s model on mediated learning was that its emphasis on adults’ instruction ignored the contributions that the child brought to the interaction process. Similarly, although Kontos (1983) found a positive effect of parents’ verbal directives on children’s problem solving, results also show that children’s problem solving performance improved regardless of parental assistance. She suggested that children’s repeated struggles and practices of the tasks facilitated their performances as well as parental assistance did. Instead of disregarding parental scaffolding, she reminded future researchers to take into account children’s individual cognitive levels and persistence as well as social mechanisms. Besides problem solving, scaffolding has also been used to support other types of skillsets, for example, children’s understanding of scientific concepts (e.g. floating and sinking in Hsin & Wu, 2011), emergent literacy skills (e.g., Heath, 1982; Pentimonti & Justice, 2010), and social skills (e.g., Baker et al., 2007). So far I have discussed theories and empirical studies concerning the influences of social interactions on cognitive development in young children. In the next section, I discuss how learning theories and child development research have been applied in museum education.

\(^3\) Executive function (EF) refers to higher cognitive processes that enable children to perform goal-directed behaviors, such as planning and solving problems, in novel situations (Hammond et al., 2012).
Parental Scaffolding in Museums

Due to positive findings of parental scaffolding in laboratory settings, museum professionals have increasingly produced exhibits and educational programs that encourage parents to participate in museum activities with their children. Sutton-Smith (1993) found that a child’s growth is associated with the playfulness of the mother’s interaction, rather than with the didactic style of interaction. With an attempt to increase the quality of family learning in museums, museum professionals have incorporated the notion of play in their design of the exhibits and the museum activities. I elaborate on the idea of play as an engaging tool for learning and how play is integrated into museum programs and central to exhibit designs, particularly in children’s museums.

Play as an Engaging Tool for Learning

Learning is often associated with an acquisition of new knowledge. Roberts (1992) asserted that “[w]e live in a culture that values work, productivity, and performance. And those kinds of goal-oriented activities are fostered by cognitive, rational kinds of thought” (p. 164). Learning becomes an increase in the amount of facts that are often irrelevant to everyday life of the learner. As a result, children’s desire to learn out of their curiosity gradually changes toward a desire to learn to fulfill performance goals such as school grade requirements. Csikszentmihalyi and Hermanson (1995) perceived learning to be more than an intellectual involvement. Learning, they argued, involves the whole person, that is, the intellectual, sensory and emotional aspects of the learner. They emphasized the importance of intrinsic motivation as an element that engages learners to the subject of their learning.

Fun activities not only attract visitors to return to the museum, but they are also crucial for learning to take place. Affect provided an emotional hook to visitors and helped them make

Unlike school learning in which students are extrinsically rewarded with grades, flow activities are intrinsically motivated because they relate to learners’ interests and consequently stimulate their desires to learn. Flow experience also allows learners to have certain limits of choice and take ownership of their actions (Csikszentmihalyi & Hermanson, 1995).

Similarly, Falk and Dierking (2002) suggested that “fun and learning are not mutually exclusive. Enjoyment is not only possible, but essential to the creation of quality free-choice learning experiences” (p. 144). Enjoyment is essential because, according to Dewey (1969), learning occurs in a continuum. A positive and fun learning experience encourages the learner to continue to learn. On the other hand, a negative impression is likely to impede future learning. In response to learning theories and early childhood research, many museums are incorporating play in their educational programs and gallery exhibits. Museum educators use play as a tool to engage young children in learning about the museum exhibits. However, the definition of play remains open. Play encompasses a wide range of activities from pretend play to rough-and-tumble, to social play with rules.

Despite the unsettled definitions of play and the different forms of play, they have some shared characteristics. Play is often referred to as voluntary activities that have no serious purposes and lack immediate goals. It is intrinsically motivated and often imitates real behaviors (Bateson, 2005; Dissanayake, 1974). Vygotsky (1978) proposed a complex notion of play. He suggested that there was no such thing as play without rules. When a situation has rules, it means that a number of possibilities for action are excluded. An imaginary play is a rule-based
situation. When a child acts out as a mother, she follows the rules of maternal behavior. She has to act mature according to the concept of a mother. In other words, she enters an imaginary world to free herself from the constraints of being a child, but at the same time she has to follow the rules of that particular role and can’t be freed completely.

Play has tremendous benefits on child development. Play creates a zone of proximal development in which a child can act beyond his average age and above what he usually does (Vygotsky, 1978). Advocates of Vygotskian theory suggested that play enabled young children to build self-regulation skills (Golinkoff, Hirsh-Pasek, & Singer, 2006; Tough, 2009). A preschooler, for example, can rarely stay still, but in a rescue play in which he is supposed to be injured, he can lay down still for a long time waiting to be rescued by his play mates. Play allows children to practice symbolic thinking (Dissanayake, 1974; Vygotsky, 1978), which is the ability to transform an object or an action as if it is something else, for example, a girl pretends that her action of jumping up and down is riding a horse. In addition, children acquire skills necessary in adulthood through play (Bateson, 2005). Golinkoff, Hirsh-Pasek, and Singer (2006) asserted that “play, especially guided play, offers a road to learning” (p. 6). Play provides an opportunity for children to rearrange new information about the world into a novel combination, which helps them to gain new insights of the situation (Bateson, 2005).

In contrast, Hutt (1966) argued that play can prevent learning. While exploration leads to the acquisition of information about a novel object or environment, play distracts children from further investigation of the object or environment. Hutt made a distinction between play and exploration. Exploration usually precedes play. “The goal [of exploration] is ‘getting to know the properties’, and the particular responses of investigation are determined by the nature of the object” (p.76). When a child becomes more familiar with the properties of the object, she will
then play. But if the child is distracted by play too early, he or she will stop exploring and lose some details that might be important about the object. Moreover, Bateson’s (2005) studies of animal and human play showed that play appeared to have biological costs because animals expended more energy, exposed themselves to greater risks of injury, and became less aware of their surrounding when they are playing. These risks are greatly minimized when children play under parental guidance in the safe environment of museum exhibits. Museum professionals have focused on the benefits of play and thus positioned play-based learning at the core of the exhibitions. I provide examples of play-based programs in different kinds of museums.

**Play-Based Learning in Museums**

Play-based learning is central to the exhibit designs in children’s museums, which target families with young children. Downey, Krantz, and Skidmore (2010) found that children’s museums across the United States explicitly advocate for learning through play in their mission statements, for example, Please Touch Museum (PTM) aims “to enrich the lives of children by creating learning opportunities through play” (PTM, 2013). Museums strive to provide an environment that initiate learning through unstructured play, which is process-oriented and open-ended, and structured play, which is governed by rules and has a clear beginning and ending (Downey et al., 2010). Children’s museums usually have a water table and child-scale models of a grocery store, kitchen, or doctor’s office available for children to engage in unstructured play such as make-believe and role-play (Puchner et al., 2001). In addition, exhibit elements such as story puzzles, jigsaw puzzles, and predesigned games give families an opportunity to engage in structured play.

Although it is difficult to integrate play elements in art exhibitions, art museum educators strive to incorporate play-based learning in weekend activities and educational programs for
family visitors. In June 2005, the J. Paul Getty Museum held a symposium titled, “From Content to Play: Family-Oriented Interactive Spaces in Art and History Museums”. One of the speakers, Susan Hoppenfeld (2005), the family and youth program coordinator of the Vancouver Art Gallery, gave an example of supersunday as a family program that incorporated both Vygotsky’s zone of proximal development (ZPD) and play-based learning in the design of family programs. On supersunday, families can engage in a range of creative play from in-gallery discussion that takes place in a form of dance to studio projects. The museum educators have tried to empower children by encouraging them to decide on the activities they want to engage in and having parents follow their decisions and participating in the activities with them. The museum also provides Family Guides, which are booklets that lead families through an exhibition with suggested questions and information.

Similarly, art museum educators at the Warhol Museum in Pittsburgh, Pennsylvania integrated pretend play in a kindergarten field trip (Krakowski, 2012). At the Warhol Museum, museum educators selected the theme of “superheroes” in order to help kindergarteners relate to Warhol’s Myth series featuring some action heroes such as Superman, Batman, and the Wicked Witch. Museum educators invited children to create their own capes using a silk-screening method and to pretend that they had some kind of super powers during their discussion in the gallery. Krakowski explained the benefits of pretend play that it engages “the whole child” and allows children to understand different perspectives when they take on different roles. Play has an intrinsic value as children play because they want to. It also allows children to put on different personas, which helps build their understanding of their socio-emotional and cultural identities. Furthermore, children develop their symbolic thinking as well as imagination in play. Play, she
added, promotes memory-in-action, in which children use play to make sense of their experiences and to hook their memories on those experiences.

In addition to the indoor space, Chermayeff, Blandford, and Losos’s (2001) case studies show how play is incorporated in outdoor science playgrounds. At the science playground at the New York Hall of Science, they found that the absence of interpretive signage allowed children to choose, experiment, and explore freely. Children made direct connections between science and their everyday physical world, which not only benefited their classroom knowledge, but also built a foundation for their lifelong learning skills such as teamwork. The playground also gave adults an opportunity to witness their children’s competence and knowledge of science.

**Effects of Exhibit Design and Programs on Parental Scaffolding**

Studies show that the nature, design, and content of the exhibit influence the level of parental participation. Wilkening and Chung (2009) found that mothers felt more comfortable to bring their young children to children’s museums rather than domain-specific museums like art museums, because they knew what to expect when they entered the door. On the other hand, they often felt less competent to teach their children in a less-familiar domain such as art (Gelman, Massey, & McManus, 1991). Children’s museums often create contextual exhibits, which, according to Shine and Acosta (1999), “invite children to step into an environment, such as a jungle, construction site, or doctor’s office, and participate in the activities suggested by the setting, often by taking on roles and engaging in pretend play” (p.124). Contextual exhibits often resemble familiar settings that visitors encounter in their daily lives such as a living room, a grocery store, a post office, and so forth (Gelman, Massey, & McManus, 1991; Ringel, 2005) in order to provide comforts for parents who are experts in the everyday social and economic scripts to engage in discussing the exhibit topic and role-taking with their children (Shine &
Acosta, 1999). The Boston Children’s Museum, for example, created a typical Japanese elementary classroom for American families to compare their own culture to the Japanese as well as to expand their cultural understanding and overturn stereotypes.

Despite children’s museums’ attempts to invite parents to participate in children’s activities, Shine and Acosta (2000) found that parents were reluctant to play in a public space and tended to follow realistic scripts. Two mothers in the study voiced their preference to participate in pretend play in an enclosed space such as the EMS exhibit. They tended to only watch their children play in an open exhibit area. Similarly, Downey, Krantz, and Skidmore (2010) suggested that the look of exhibit elements such as low tables and small seats can send a wrong signal to parents that exhibits were designed to accommodate only young children. Consequently, parents may step back and provide less or no scaffolding.

According to interviews and observations at three children’s museums, Beaumont (2006) specified three factors of exhibit design that influence parental scaffolding: seating, labels, and the presence of floor staff. She found that seating had both a positive and negative effect on parent-child interactions. Although seating provides a space for parents to rest, it may withdraw parents from playing alongside their child. Gaskins (2008) explored the effect of seating further by providing mobile seating that was light and easy to move around at the digging exhibit at the Chicago Children’s Museum. She found that parents’ decisions whether to join the child’s play or to sit back outside the digging pit were greatly influenced by their early judgment of the potential of the exhibit for activities in relation to the child’s interest and capability. If the activity is beyond the child’s ability, the parent is likely to step in and scaffold the child. However, if the parent thinks that the task is manageable for the child, she tends to let the child work on the task on her own. Her theory of matchmaking aligns with Pentimonti and Justice’s
(2010) explanation of effective scaffolding, which requires teachers or adults to have an understanding of the task and the child’s level of development in order to provide “the level of scaffolding necessary to assist a student in successfully completing a task” (p. 243). The museum staff can assist parents in this process by giving information or suggested questions to the parents. Mothers in Beaumont (2006) explained that labels that addressed simple questions or challenges helped them initiate a conversation with their children. They also found the presence of staff to be helpful because of their knowledge on the exhibit contents.

In addition, the museums have attempted to provide exhibit-based scaffolding to families with young children by simplifying difficult concepts to match the level of knowledge of very young children. One of the few examples is the Children’s Museum of Indianapolis’s The Power of Children: Making a Difference exhibition (Wolf & Wood, 2012). The exhibition is designed for older children due to the serious content of prejudice and intolerance, which is presented through the lives of Anne Frank, Ruby Bridges, and Ryan White. Such concepts are beyond the understanding of very young children such as preschoolers. Museum educators, however, translated these concepts into the “Kindness Tree,” each leaf of which contains a simple message of kindness, such as “Sit with someone new” (p. 34). The features not only scaffold children, but also assist parents in helping their children learn these concepts.

The design and content of the exhibits reflect museum educators’ and designers’ theories of learning and expectations of parental involvement in museum exhibitions. In spite of the good intention to enhance family learning, these exhibit designs and intervention programs disregard the fact that different families have different views regarding adult-roles in children’s play and different agendas for museum visits. Their intention to increase parental involvement may
contradict different styles of parenting practices in cultural groups, who are considered the minority of museum visitors. This issue is further discussed next.

**Mismatch in Cultural Understanding of Parental Role in Children’s Play**

Museum professionals’ stances on learning theories and child development dictate the design of the exhibits and the delivery of museum programs. Many museum exhibits were designed based on an underlying theory that children learn through open-ended play (Downey, Krantz, & Skidmore, 2010) and learning is enhanced when adults participate in the play and scaffold children’s learning experiences (Gaskins, 2008; Luke & Windleharth, 2013). Despite disagreement in the level of parents’ participation in play, there seemed to be a consensus among play researchers that “adults play a key role in the facilitation of play” (Downey, Krantz, & Skidmore, 2010, p. 19). Findings of many empirical studies in children’s museums support that statement and show that children were more likely to learn when adults asked them open-ended questions (Haas, 1997) and were highly involved with the exhibit elements with the children (Puchner et al., 2001). Gaskins (2008) also found that these predominant views of play equals learning and high parental involvement in children’s play were also shared by middle-class European Americans.

Middle-class European Americans are not only the majority of museum visitors (Farrell & Medvedeva, 2010; Reach Advisors, 2010B), but also the majority of research participants conducted in museums (e.g., Acosta, 1997; Beaumont, 2006; Downey, Krantz, & Skidmore, 2010). They were mostly either museum members or general visitors who visited museums during general operating hours and presumably could afford to pay full-priced admission (Beaumont, 2006; Gallagher & Dockser, 1987; Grove, 2012; Puchner et al., 2001). Beaumont (2006) found that member mothers who were mostly college graduates had an understanding of
learning theories that aligned with child development literature. As a result, they successfully provided verbal and non-verbal scaffolding to their children as well as learned about their child’s development through observation. Nonetheless, she cautioned the applicability of her findings to other museum visitors and urged researchers to conduct studies with other ethnicities in order to better understand museum visitors more fully.

In contrast, Downey, Krantz, and Skidmore (2010) interviewed a sample of predominantly white female, highly educated caregivers and found that only 15% of the sample associated play with learning, while 41% of the sample valued the visit for the enriching experience and 36% for skill-building. Most caregivers in the sample stated their role in the exhibit was to play and have fun with the children and allowed children to direct play activities; however, observations revealed that most caregivers exhibited supervisory and instructional behaviors and only one-third of the caregivers played with their children. This inconsistent result suggests that some parents may lack confidence, knowledge, or skills to facilitate play. Moreover, the design and content of the exhibit may not provide enough support that helped caregivers notice the potentials of the exhibit for activities or learning that adults and children could do together.

In addition to the white middle class, Gaskins (2008) further investigated learning theories and perceptions of parental role in children’s play in other cultural groups, including African-Americans and Hispanic-Americans. She found that more than half of the African-American mothers in her sample saw a connection between play and learning; however, they did not perceive themselves as children’s play partners in most occasions. On the other hand, Hispanic-American mothers viewed museum visits not as a learning experience but as social and fun experiences, in which children played with siblings and caregivers. In spite of a small sample
size, this preliminary study shows that cultural background influenced parents’ perception of their role in children’s play and the purpose of a museum visit. Besides cultural background, Gaskins also suggested that the age of the children and the genders of both the adults and the children might also be other factors that influence parents’ agendas and expectations of a museum visit. The museums need to provide diverse opportunities to accommodate all these different expectations in the museum exhibits.

**Cultural Understanding of Low-Income Parents**

Another factor that is rarely examined in visitors’ studies and museum education is the impact of socioeconomic status of museum visitors on families’ learning experiences. A recent study conducted by the National Center for Educational Statistics (NCES, 2015) shows that low-income levels are associated with lower levels of educational attainment. Previous studies (i.e. McLoyd, 1990; Lovejoy, Graczyk, O’Hare, & Neuman, 2000) also show negative effects of low socioeconomic status on parenting behaviors due to psychological distress of the negative life circumstances. As an example, Lovejoy et al. (2000) found that economic disadvantage increases depressed mothers’ likelihood of irritability and hostility toward the child. Yet, the effects of depression vary depending on the child’s age with a moderate degree of unresponsiveness in depressed mothers with infants. Nonetheless, Okado, Bierman and Welsh (2014) argued that parenting distress and parents’ support for learning were two separate constructs. Amidst economic distress, low-income parents who participated in school readiness intervention programs can also enhance children’s school readiness skills.

Furthermore, other qualitative studies report that the negative association of lower SES and children’s poor academic performances are the results of the use of a White, middle class model to assess family practices and child competencies (Jarrett, Hamilton, & Coba-Rodriguez,
Similarly, Lareau (2003) found that a difference in the cultural values of low-income parents resulted in them not trying to cultivate social and cognitive skills like middle-class parents. Rather, “sustaining children’s natural growth is viewed as an accomplishment” (p. 5). As a result, poor children did not develop dominant cultural repertoires that helped them succeed in school and later work life.

Barton, Drake, Perez, St. Louis, and George (2004) contended that parental involvement, so far, had been considered in terms of what parents do, for example, whether they participate in parent-teacher conferences or other school events, while ignoring “power differences and conflicts that parents from language and ethnic minority backgrounds often experience in their children’s schools” (p. 5) and their efforts to become an active participant in those events. For example, Edin and Lien’s (1997) in-depth study on welfare dependent and low-wage mothers shed some light on the dilemma of welfare dependency. They found that the welfare dependent mothers had to weigh the costs and the benefits of full-time jobs and leaving their children unsupervised due to the lack of affordable childcare facilities. Concerns of child safety made them decide to remain on welfare and rely on cash assistance from work (formal, informal, and underground), their network of friends and family, and agencies and charities as the last resources.

Given the poor living conditions and limited access to educational resources of families in poverty, the Association of Children’s Museums (ACM) and the Institute of Museum and Library Services (IMLS) recognized a need to “[make] the high-quality learning experiences of children’s museums more accessible to low-income families” (IMLS, 2014, para. 1) and consequently launched a program for low-income families, called Museum for All with 44 participating children’s museums across the country. Yet, few studies examine how the low-
income families learn in museums and how parents and children interact within the exhibits. Therefore, there is a need to investigate this population and their experiences in children’s museums to better understand and accommodate their needs.

**Chapter Summary**

Parents play an important role in child cognitive and social development. The positive correlations between adult scaffolding and children’s learning found in numerous empirical studies drive changes in exhibit design and educational programs in museums that encourage parental involvement in children’s activities in museum exhibits. Such a stance may reflect the practices of the majority of museum visitors, who are white middle class and attain a college level of education. However, Gaskins’ (2008) preliminary study shows that cultural background influences parents’ theories of learning and perceptions of their role in the museum, which differ from those of the mainstream. ACM and IMLS acknowledged the need to support low-income families by increasing accessibility of museum learning to this disenfranchised group. Studies show contradictory findings regarding levels of parental involvement in low-income families. In addition, little is known about the low-income visitors in children’s museums. In order to better accommodate their needs and enrich their learning experiences, I conducted a study with a group of Access Pass members at the Children’s Museum of Indianapolis. I discuss the methodology and research design of this study in the next chapter.
CHAPTER 3

METHODOLOGY

This study is grounded in constructivism, “which assumes multiple, apprehendable, and sometimes conflicting social realities that are the products of human intellects . . . [and] sees knowledge as created in interaction among investigator and respondents” (Guba & Lincoln, 1994, p. 111). Instead of pursuing objective truth, constructivists believe that knowledge is constructed, culturally specific, and alterable (Schwandt, 2003). In contrast to post-positivist researchers who try to control variables in the environment, constructivists document and embrace contexts and personal histories in order to make sense of the phenomenon. Qualitative methods such as participant observation, ethnographic case study, and interviews are typically associated with constructivism, because they aim to obtain both the etic perspectives of the outsiders (researchers, policy makers, exhibit developers, museum educators) as well as the emic perspectives of the insiders (the subject of the study such as low-income families) by observing and engaging with different stakeholders in their natural setting (Eckert, 1987).

I used a case study method to gain a holistic understanding of scaffolding behaviors that low-income parents might use with their children in a children’s museum. The case is an early childhood exhibition called Playscape at the Children’s Museum of Indianapolis (TCM). The case satisfies both intrinsic and instrumental purposes (Stake, 1994). Playscape was intrinsically interesting to me because I, who was an intern at TCM, had a personal connection with the museum staff members and was familiar with the museum etiquette and space. The new design of Playscape also reflected current research in early childhood education and aimed to better accommodate family learning. In other words, it could be considered as one of the “best” case
scenarios. Playscape also serves as an instrumental case study, because it is specifically designed
to encourage parents to participate in children’s play and scaffold children’s learning in the
exhibition. Thus, it provides an ideal environment where I can examine parental scaffolding.

In order to achieve a complete understanding, I sought different perspectives of
stakeholders through the use of triangulation. Triangulation is commonly used to increase the
validity of a study. The desired goal of triangulation is to yield convergent findings from
different data sets. Nonetheless, Mathison (1988) suggested that inconsistent or contradictory
findings could also reveal the complexity of a social phenomenon. For the purpose of the study, I
used two types of triangulation, one of which is data triangulation. According to Denzin (1978),
data triangulation refers to the use of different data sources. A source of data can be an
individual, a point in time, or a location. In the study, the interviews were conducted not only
with caregivers, but also with museum staff who were involved in the exhibit design and the
delivery of educational programs in Playscape. In addition, I also collected documents relating to
the old and the new Playscape.

The other type of triangulation is methodological triangulation, which predominantly
refers to the use of more than one method. “The rationale for this strategy is that the flaws of one
method are often the strengths of another: and by combining methods, observers can achieve the
best of each while overcoming their unique deficiencies” (Denzin, 1989, p. 244). Interview data
rely heavily on the articulation of one’s thoughts and social experiences, which may contradict
the actual behaviors of a person. In addition to interviews, I also observed caregiver-child
interactions and interpreters’ facilitation of family interactions in Playscape.
Research Site

The study was conducted at The Children’s Museum of Indianapolis (TCM) due to a number of reasons. First, being an intern in the research and evaluation department at TCM in summer 2012, I was familiar with the museum’s space, etiquette, and staff. Jorgensen (1989) suggested that “[w]here the researcher is located socially determines what is observable, the character of observations, and opportunities to observe” (p. 53). My presence as an outsider researcher may cause an uneasiness among museum staff and family visitors; however, having been part of the museum team, museum staff would behave more comfortably with me and support me during the process of data collection. In addition, I would gain more trust from families when they see me as part of the museum.

Second, TCM holds family learning at the center of its mission. Family learning guides the design of the exhibits as well as the interpretations of its educational programs to be multi-leveled and multi-generational. Seating in some exhibit areas, for example, is built to accommodate at least one child and one adult. Third, TCM adheres to and invests in research in child development, family learning, and museum education. In addition to the use of existing literature, the museum has an in-house research and evaluation team that conducts formative and summative evaluation as well as prototypes testing in order to better understand and improve visitors’ museum experiences.

Finally, TCM serves families of all backgrounds. Although the admission fees are relatively high ($13.50 for youth ages 2 – 17 years old, $18.50 for adult ages 18 – 59 years old, and $17.50 for seniors), the museum offers free admission on the first Thursday of each month from 4 to 8 pm and on special days such as Martin Luther King Jr. Day, President’s Day, and Christmas Eve. In addition, low-income Indiana families who receive state assistance, such as
food stamps, Hoosier Healthwise insurance or temporary assistance (TANF) may enroll in the Access Pass program. Qualifying families pay $1 admission per person per visit. The free nights and the Access Pass program are vital for the museum to better serve its local population, 18.9 percent of which live below the poverty level and 27.5 percent of which are African American (U.S. Census Bureau, 2013A). Both percentages are higher than the U.S. national statistics, in which 14.1 percent lives below the poverty level and 13.1 percent are African American (U.S. Census Bureau, 2013B).

**Early Childhood Exhibition, Playscape**

Playscape is particularly designed for families with children aged five years old and under. TCM recognized the importance of the Playscape as the first entry point for families to bring their young children to the museum and develop a life-long relationship with TCM. Playscape was opened in 1981 and underwent a second renovation in 2012 (Reason, 2013). It was reopened to the public on August 31, 2013 with a bigger space and new amenities such as private nursing cubicles and diaper-changing stations to accommodate the needs of mothers with very young children. The new 8,447-square-foot Playscape consists of four exhibit spaces: Babyscape, Art and Music Studios, Invented World, and Natural World. The guiding principles of the new Playscape are (1) to encourage children to learn through play, (2) to encourage parents or adult caregivers to play with the child, and (3) to support child-directed play (TCM, 2011).

Each play area has a unique theme and focuses on different content areas and skills. The **Babyscape**, for example, is primarily designed for infants and toddlers. It provides a safe environment for younger children “who accrue their understanding of the world through visual, aural, and motoric stimulation” (TCM, 2011, p. 9). The design of the space mimics a natural
setting with tree and animal motifs to encourage conversations between parents and children about what they see. Since the target age group of the Babyscape is younger than that of the study, the participants rarely spent time in this area.

For the purpose of my study, I focused on the other three exhibit areas: the Invented World, the Natural World, and the Art and Music Studios. The Invented World provides an opportunity for families to experiment with science, technology, engineering, and math (STEM). It aims to foster critical inquiry skills such as questioning, generating hypotheses, and testing. Children will learn about cause and effect by manipulating simple machines at different stations such as Reaction Contraptions and Whirly Twirly Tower. The space also features Blockopolis, where children can build complex structures with different types of wood blocks (TCM, 2011; Reason, 2013).

Unlike other parts of the museum, the Natural World has many windows that let natural light into the space. It provides an opportunity for children to exercise gross motor skills and reconnect with the outdoor environment in three hands-on areas, which are the Creek, the Pond, and the Sandbox. The Creek features natural-looking rocks, a small waterfall, and two realistic-looking streams. Above the water feature, there is a “cloud” that pours water down into the pond (Rudavsky, 2013). The Pond is located at the back of the Creek. It features a stack of giant lily pads, where children can climb up to the boats situated at the top of the Pond.

In the Art and Music Studios, families are encouraged to make art and impromptu music using natural materials and authentic musical instruments such as glockenspiels, Hapi drum, clatterpillars, and frog rasps. The goals of these two areas are to empower children in the process of art and music making and to learn about cultural identities through the arts. In addition to
exhibit elements, Playscape interpreters also lead art and music programs, each of which takes place twice daily at specific hours to enhance family experiences in art and music making.

Participants

The main purposes of this study are to understand how low-income caregivers might use elements of scaffolding with their preschool-aged children in Playscape and how parental assistance is facilitated or constrained by the exhibit design and program arrangements of museum staff. Thus, the study is comprised of two main groups of participants: one is low-income family visitors in the Access Pass program, and the other is TCM staff including the Playscape designer, the director of early childhood education, the early childhood specialist, and interpreters in Playscape.

In terms of the low-income families, I recruited and mostly observed families who came in a group of one adult and one child. According to the study of visitors’ learning talk at the Exploratorium, Allen (2002) advised researchers to select participants from groups of two visitors (adult-child dyads) rather than adult-child dyads who are part of larger groups in order to “keep the complexity of the situation at manageable levels” (p. 267). In the pilot observations of the visitor groups, she found that larger groups tended to split up and reform. As a result, they were likely to talk about things they had previously done and seen in other exhibitions rather than about exhibit elements or activities in front of them. Such reflective talks complicate the coding scheme. Another complexity of observing adult-child dyads in large groups is that the dyads sometimes switch pairs. During my internship at TCM, I also found that children in large groups sometimes did not pair up with the same adult throughout the exhibition. The researchers could not simultaneously keep track of both the same adult and the same child. Thus, the selection criteria for participants in this study were as follows:
• The family participated in the Access Pass program.

• The family came in a group of one parent (the term “parent” in this study refers to any accompanying adult who is 18 years old or older) and one child whose age is between 3 and 5 years old.

• They used English to communicate to each other, so that their conversations were intelligible to me and could be transcribed for further analysis.

• They spent at least 15 minutes in the exhibition in order to yield sufficient data.

The museum granted me permission to recruit participants from members of the Access Pass program. It was, however, determined that the museum would contact the members first and those who were interested in participating in the study would complete an online demographic questionnaire and left their contact information so that I could schedule museum visits with them. This method left me with a self-selected sample of the underserved population. I will discuss shortcomings of self-selection later in the limitation section.

The museum sent four waves of emails to Access Pass members who lived in the metropolitan area of Indianapolis. The table below shows the number of respondents who submitted the online demographic questionnaires and the number of participants whom I was able to contact and schedule a Playscape visit.

<table>
<thead>
<tr>
<th>Wave</th>
<th>Number of Access Pass Members</th>
<th>Number of Respondents</th>
<th>Number of Participants</th>
<th>Rate of Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Wave April 28</td>
<td>200</td>
<td>13</td>
<td>3</td>
<td>0.015%</td>
</tr>
<tr>
<td>2nd Wave May 7</td>
<td>250</td>
<td>12</td>
<td>7*</td>
<td>0.028%</td>
</tr>
<tr>
<td>3rd Wave June 13</td>
<td>250</td>
<td>3</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>4th Wave July 1**</td>
<td>250</td>
<td>14</td>
<td>2</td>
<td>0.008%</td>
</tr>
<tr>
<td>Total</td>
<td>950</td>
<td>42</td>
<td>12</td>
<td>0.013%</td>
</tr>
</tbody>
</table>

* One family has a twin. The father brought one and the mother brought the other.
** Incentive increases from $15 to $25 per dyad per visit.

Table 1. The table shows the rates of participation from the four waves of invitation.
The highlighted areas on the map in Figure 1 illustrate where the twelve families live so that the reader can get an idea of how far the families had to commute to the children’s museum. The travel times range from 15 minutes to 35 minutes by car without traffic according to the Google Map.

*Figure 1.* The map shows the areas where the twelve families lived in relation to the location of the museum (illustrated as a star on the map)

The graphs below (Figures 2 – 4) illustrate demographic information of the twelve family participants in terms of age groups and educational attainment of the caregivers and the number of children per family.
**Figure 2.** The bar graph shows age groups of the parents in the study.

**Figure 3.** The bar graph shows the level of educational attainment of the parents in the study.
Based on Hood’s (2004) definition of frequent visitors that “the frequent visitors [are] those who go to museums at least three times a year” (p. 153), nine out of twelve families in the study (or 75 percent) are frequent museum visitors.

Table 2. The table shows the frequency of visits to TCM per year.

<table>
<thead>
<tr>
<th>Frequency of Visits to TCM per year</th>
<th>Number of Families</th>
</tr>
</thead>
<tbody>
<tr>
<td>Once a week</td>
<td>1</td>
</tr>
<tr>
<td>2-3 times a month</td>
<td>0</td>
</tr>
<tr>
<td>Once a month</td>
<td>4</td>
</tr>
<tr>
<td>Every other month</td>
<td>0</td>
</tr>
<tr>
<td>2-3 times a year</td>
<td>4</td>
</tr>
<tr>
<td>Once a year</td>
<td>3</td>
</tr>
</tbody>
</table>

Out of the initial twelve families who visited Playscape between May and July, I asked three families, who are also frequent visitors, to revisit Playscape. One family visited Playscape twice and the other two visited Playscape three times within five months. The families were selected based on their willingness to make a repeated visit and their elaborate explanation of their behaviors in the first interview session, as Stake (1994) suggested researchers to select “cases
that seem to offer *opportunity to learn*” (p. 243). This method is called progressive sampling, which originates from the idea of “progressive focusing” in Parlett and Hamilton (1972). Progressive focusing requires the researcher to become well acquainted with the phenomenon before redefining the focus of the study (Hamilton, 2005; Stake, n.d.).

Repeated visits served as a way to triangulate observational findings. Besides a person as a unit of analysis, Denzin (1989) suggested that time is another source of data, which is directly related to ongoing interactions. Behaviors may vary at a different point in time due to familiarity and trust building. Through repeated encounters, families, particularly young children, became more comfortable with me and acted more naturally when I observed them in Playscape and during the interview process. In addition, few visitor studies have been conducted with repeated visits of the same families in the same exhibition. This gave me an opportunity to observe how parental scaffolding and the child’s understanding of exhibit elements may evolve as a result of familiarity.

In addition to families enrolled in the Access Pass program, I also interviewed the Playscape designer; the director of early childhood education, who administered the preschool programs at the museum and introduced a new interpretive approach based on the book *Powerful Interactions* (Dombro, Jablon & Stetson, 2011) to the Playscape interpretation team; and an early childhood specialist, who oversaw the management and daily operation of Playscape. Her responsibilities include staff training, creating scripts and instructional resources for art and music programs, as well as the maintenance of equipment and toys in Playscape. She also led programs in Playscape and thus allowed me to observe her during the music program. She introduced me to four other Playscape interpreters, whom I also observed and interviewed. Two of the four interpreters, Molly and Katie, worked on a weekly rotation between exhibitions. The
other two interpreters, Julia and Rose, usually worked as instructional assistants in preschool classrooms in the museum during school semesters, but they were assigned to work in Playscape in the summer. Both of them also led the art and the music programs.

**Participation Incentives**

Access Pass families who were recruited through the first three waves and visited Playscape received free admission and a $15 coupon for the museum cafeteria. In the fourth wave, the incentive was increased from $15 to $25 due to the low response rate. Therefore, family participants who were recruited through the fourth wave and/or made a repeated visit received free admission and a $25 coupon. Museum staff did not receive any incentives.

**Research Procedure**

The study was composed of three phases of data collection. In the first phase of the study, I conducted semi-structured interviews with the exhibit designer and the director of early childhood education in order to learn about learning theories that guide the development and the design of the new Playscape, their interpretations of the term “scaffolding,” and their expectation of the parental role in accommodating children’s learning in Playscape. I also interviewed the early childhood specialist about the new interpretive approach based on the book *Powerful Interactions* and how it was implemented in the new Playscape. As part of data triangulation, I also observed the early childhood specialist and interpreters perform Powerful Interactions with family visitors in the gallery and asked them to elaborate on specific Powerful Interactions moments and their perceptions of scaffolding in the follow-up interviews. Interview questions for museum staff can be found in Appendix G. The observations and interviews of museum staff including interpreters took place between June and July 2014.
The second phase of the study involved naturalistic observation of low-income family dyads in Playscape and follow-up interviews with caregivers right after the Playscape visits. This initial group of family dyads visited Playscape between May and July 2014. On each day of the scheduled visits, I greeted the family in front of the ticket office. I purchased the admission tickets for the family and then stopped by the cafeteria to explain about the study and the research procedure, which included in-gallery observation, voice recording, a brief questionnaire, and a semi-structured follow-up interview. The caregiver who agreed to participate in the study would sign an informed consent. I also asked the child if it was okay for me to go with them to Playscape and see how he or she played with the caregiver. Once I receive the child’s assent, I asked the caregiver to attach a wireless microphone and a transmitter on his or her clothing and asked the child to wear a small voice-recording necklace. Then I led them to Playscape. I told them to spend as much or as little time as they wanted. When they entered Playscape, I stood 3 – 4 feet away from them to observe and describe their behaviors into my voice-recorder.

When the dyad exited the Playscape, I thanked them and gave the $15 or $25 coupon to the caregiver. If the child was hungry and wanted to eat something, I asked to go to the cafeteria with the family and interviewed the caregiver as they were having lunch or a snack. But if the child wanted to go to another exhibition, I asked to follow them and interview the caregiver as they were walking or staying in another exhibition. After the interview, I asked the caregiver to fill in a brief questionnaire and then return the voice recorders. The set of follow-up interview questions for caregivers can be found in Appendix J.

The last phase of data collection involves progressive focusing (Parlett and Hamilton, 1972, cited in Hamilton, 2005; Stake, n.d.), in which I contacted four families from the initial fourteen families and invited them to make a repeated visit with their children to Playscape.
These repeated visits took place in July and October 2014 and were at least a month apart from the previous visit. The procedure resembled that in the second phase: families signed the new version of informed consent (Appendix E), visited Playscape, and then engaged in an interview. The new interview questions can be found in Appendix K. One of the two families who visited Playscape three times brought another child beside the primary child of the study to Playscape. Although it did not satisfy the initial criteria, I included the observational data in the data analysis because it represented a normal visit in which the caregiver needed to assist more than one child at a time.

**Data Analysis**

After an in-gallery observation, I transcribed the parent’s, the child’s and my voice-recordings. I used two levels of person analysis to analyze the interview and observation transcripts. According to Denzin (1989), the first level is aggregate-person analysis, in which each data source is collected as a separate account with no direct relationship. Aggregate-person analysis was used with interview data of the parents, a senior exhibit developer, a designer, and interpreters as well as existing Playscape documents. In addition, I employed an interactive analysis with observational data of social interactions that take place within Playscape. Instead of focusing on an individual account, I examined specifically the interactions between the parent and the child, and possibly an interpreter.

Having a small number of family participants, the study does not necessitate the use of coding. However, the primary research question aims to discover characteristics and patterns of scaffolding that parents used with their children in Playscape. Sandelowski (2003) suggested that the frequency of occurrence could assist qualitative researchers in finding patterns in qualitative data. Pattern Recognition implies seeing something over and over again in one case or across a
selection of cases. Finding that a few, some, or many participants showed a certain pattern, or that a pattern was common or unusual in a group of participants, implies something about the frequency, typicality, or even intensity of an event (p. 341). Consequently, after I transcribed the observational data, I categorized parental involvement into two sets of codes; one consists of scaffolding behaviors that fit into the problem-solving context with purposive goal attainment, and the other is a set of behaviors that parents intend to enhance learning and skillsets beyond problem-solving; for example, language development, critical thinking, and learning new concepts. The first set derives from Wood et al.’s (1976) scaffolding process. It is only applied to parent-child interactions that take place while they are working on a predefined task, mostly with a close-ended outcome. The other set is an adapted list of parents’ behaviors from the literature in social development and museum learning (Beaumont, 2006; Beaumont, 2010; Benjamin, Haden, and Wilkerson, 2010; Hammond, Müller, Carpendale, Bibok, and Liebermann-Finestone, 2012; Wood et al., 1976) and from the ALFIE (Assessment of Learning Families in Informal Environment) inventory used in data analysis at the Children’s Museum of Indianapolis (TCM, 2014). This set of learning and skill-enhancing behaviors is used with open-ended activities such as music making, art making, free play at the Sandbox and the Creek.

Scaffolding Behaviors

- **Recruiting Interest**: The parent gets the child’s interest in the task and work on the task.
- **Reducing degree of freedom**: The parent simplifies certain aspects of the task or reduces the alternative options so that the child can work on the manageable parts.
- **Maintaining Attention**: The parent maintains the child’s focus on the task and encourages the child to complete the task.
• **Marking critical features:** The parent points out and/or explains the difference between what the child has produced and the desired outcome.

• **Minimizing Frustration:** The parent intervenes when or before the child shows a sign of frustration while working on the task.

• **Demonstrating:** The parent demonstrates the solution or a part of the solution to the child for the child to imitate and produce the desired outcome.

Learning and Skill-Enhancing Behaviors

Non-verbal Scaffolding

• **Facilitating:** The parent facilitates the child's play/task by setting up or modifying the environment to make it easier for the child to work on the task. For example, the parent grabs a boat that is out of the child's reach to the child. The parent looks for the right shape for the child.

• **Hinting:** The parent provides a hint by pointing at a picture or a model to help the child to advance the task without giving out the full solution.

• **Modeling/Demonstrating:** The parent models or demonstrates for the child how to accomplish a task, do an activity, or learn a new skill and often for the child to imitate the behavior. For example, the mother demonstrates how to squeeze water out of the turkey baster.

Verbal Scaffolding

• **Exploring:** The parent mentions something about another exhibit element, while the child is walking or playing at one exhibit element. The parent tries to recruit the child's interest and to encourage him/her to explore a new element.
• **Maintaining attention:** The parent encourages the child to continue working on a task or to complete the task, sometimes to maintain the attention and spirit of the child on the task, for example, “You can do it,” "Let's give it another try."

• **Encouraging prosocial behaviors:** The parent asks the child to play nicely, be considerate, and/or share with other people.

• **Hinting:** The parent provides hints, cues, or asks exhibit-related questions (what, where, when, why, how, do/don't) to get the child to explain, to think, or to reconsider his/her choice of action so that the child can accomplish the task or expand his/her thinking. The hints do not include a full solution, for example, the child says that she is building a house, but she creates only one wall. Father asks, "How many walls does a house have? How can you get into the house?"

• **Asking questions:** The parent asks the child for information about what the child is doing or asks the child to describe an aspect of the exhibit element, mostly reinforce the child to describe colors, shapes, and counting, for example, "What are you building?" "What is the color?" "How many are there?"

• **Providing information:** The parent describes what the exhibit element is and how it works in general or uses the sign at the exhibit element to give the child some information, for example, “This is called a Hapi drum.”

• **Giving an instruction:** The parent tells the child what to do and how to do it to accomplish the task.

• **Posing a task:** The parent poses a task, a question, or a challenge to initiate the child into doing something, for example, “Let's see how fast you can reach the boat" and "How can you get the ball to go into that track?"
• **Connecting to prior experiences**: The parent relates the activity or the exhibit element to the child's prior knowledge or previous experiences outside the Playscape, for example, "Are you sifting flour?" "These notes are just like Dad's guitar" "Have you seen this object anywhere before?"

• **Verbalizing/Repeating**: The parent repeats the word or sentence that the child has just said either in the form of a question or a statement in order to give the child an opportunity to listen to the correct pronunciation of the word.

• **Engaging/Framing in a pretend play**: The parent and the child engage in a pretend play, which involves imagination and symbolic play, or the parent frames the child’s activity in a pretend play setting to encourage the child to use his/her imagination.

Verbatim transcripts of the audio records from both the participants’ voice recorders and my voice recorder will be coded. The transcript will be parsed by the exhibit element (Allen, 2002), for example, the Creek, the Climber, and the Blockopolis. The coding units will be parsed by the subject (the parent or the child) and/or verb in a sentence (Benjamin et al., 2010). One code may be applied multiple times at one exhibit element. In order to exemplify each coding behavior, I selected a series of play episodes or “vignettes,” which are according to Stake (1995), defined as “an extreme representation, quite atypical” aspect of the case, from observations, interviews, and document analysis in order to “transfer experiential knowledge” (Stake, 1994, p. 241) of low-income parental scaffolding and provide vicarious experience to the reader.

**Chapter Summary**

This study examines the notion of parental scaffolding in low-income families from a constructivist perspective, in which knowledge is culturally specific and constructed as a product of the interactions between the researcher and the participants. In order to gain a better
understanding of scaffolding in a children’s museum, I employed a case study method and selected the Playscape at the Children’s Museum of Indianapolis as the intrinsic and instrumental case of the study. One group of the participants was drawn from the Access Pass members and the other was the museum staff, who were involved in the exhibit design and the interpretive program in the Playscape. Three out of 12 parent-child dyads made repeated visits for in-depth observations and interviews regarding the rationales of their scaffolding behaviors. The observational data and interviews were then transcribed verbatim and coded to find scaffolding patterns that the parents in the study used with their preschoolers in the exhibition. Examples of play scenarios were also presented to illustrate each scaffolding behavior at different exhibit areas. In the next chapter, I described the demographic and background characteristics of the twelve parent-child dyads, because an understanding of their life’s circumstances could potentially enhance the interpretations of their scaffolding behaviors and parent-child interactions in Playscape.
CHAPTER 4
PARENT-CHILD DYADS

Before delving into parent-child interactions in Playscape, I want to introduce each parent-child dyad through the notes of my observation and conversations with them during the museum visit. Descriptions of the families vary in length and details depending on a number of factors, most importantly, the number of visits and my ability to engage them in an open conversation. I was able to build more trust and thus learn more about the families who made repeated visits than those whom I met once. Nonetheless, these descriptions help me to better understand their life circumstances and the way they interacted in Playscape.

A couple of days before the scheduled visit, I usually made a call to confirm with the parent that he or she was still willing to join the study and could still visit the museum on the set date. I also emphasized that I would be waiting for them by the Bumblebee Autobot and given my Asian appearance and the staff badge, it should be easy for them to identify me. On each day of the scheduled visit, I waited anxiously for the family at the bottom of the ramp, which connects the second floor of the parking garage located on the other side of the street to the museum building. I usually arrived 10 – 15 minutes before the time of the appointment, most of which was at 10 o’clock in the morning, when the museum opened. I stood by the 17-foot-tall Bumblebee Transformer reciting the names of the parent and the child I was about to meet and making sure that my name on the staff badge faced outwards. I made frequent eye contact with many families who walked down the ramp and smiled to them in a hope that the parent would say, “Are you Wasana?” About three quarters of the scheduled families arrived within 5 – 10 minutes of the scheduled time, while the other quarter never appeared and could not be reached by phone or email. In this chapter, I present the twelve families who made at least one visit to the
Playscape and participated in a post-visit interview. The names of the participants are pseudonyms. The table below shows a summary of demographic and background information of the twelve dyads.

<table>
<thead>
<tr>
<th>Parent (age range)</th>
<th>Child (age)</th>
<th>Race</th>
<th>Parent’s Level of Education Attainment</th>
<th>Parent’s Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melicia (30 – 39)</td>
<td>Mica (4)</td>
<td>African American</td>
<td>Associate degree</td>
<td>Unknown</td>
</tr>
<tr>
<td>Maria (21 – 29)</td>
<td>Ethan (3)</td>
<td>White American</td>
<td>Bachelor’s degree</td>
<td>Stay-at-home mom</td>
</tr>
<tr>
<td>Orlena (21 – 29)</td>
<td>Tehila (5)</td>
<td>African American</td>
<td>Associate degree</td>
<td>College student; Part-time worker</td>
</tr>
<tr>
<td>Katie (21 – 29)</td>
<td>Ally (4)</td>
<td>White American</td>
<td>Some college, but no degree</td>
<td>Full-time worker</td>
</tr>
<tr>
<td>Sam (21 – 29)</td>
<td>David (3)</td>
<td>White American</td>
<td>Some college, but no degree</td>
<td>College student</td>
</tr>
<tr>
<td>Mikaela (30 – 39)</td>
<td>Marcus (3)</td>
<td>White American</td>
<td>High school graduate</td>
<td>Stay-at-home mom</td>
</tr>
<tr>
<td>Brooke (30 – 39)</td>
<td>Luis (5)</td>
<td>White American</td>
<td>Associate degree</td>
<td>Stay-at-home mom</td>
</tr>
<tr>
<td>Ben (30 – 39)</td>
<td>Hannah (5)</td>
<td>White American</td>
<td>Bachelor’s degree</td>
<td>Engineer</td>
</tr>
<tr>
<td>Angela (21 – 29)</td>
<td>Mira (4)</td>
<td>White American</td>
<td>Associate degree</td>
<td>Preschool teacher</td>
</tr>
<tr>
<td>Melah (30 – 39)</td>
<td>Marvin (3)</td>
<td>African American</td>
<td>High school graduate</td>
<td>Stay-at-home mom</td>
</tr>
<tr>
<td>Sarah (30 – 39)</td>
<td>Alice (5)</td>
<td>White American</td>
<td>Some college, but no degree</td>
<td>Certified yoga trainer</td>
</tr>
<tr>
<td>Molly (40 – 49)</td>
<td>Jacob (4)</td>
<td>White American</td>
<td>High school graduate</td>
<td>Part-time worker</td>
</tr>
</tbody>
</table>

Table 3. The table summarizes demographic and background characteristics of the twelve dyads.

**Melicia and Mica**

Melicia and Mica was the first family who joined the study. On the day of the museum visit, Melicia approached me and said, “Hi!” I looked up and saw a girl in a matching neon pink color tank top and shorts standing next to her. I remembered from our phone call that her daughter, Mica, was 4 years old, but she seemed very tall for her age. I confirmed with Melicia whether Mica was actually four and she told me that Mica would turn five in two months. Mica
did not say anything to me. She held her mother’s hand tight and stood very closely to her mother. As the only child, Mica seemed to be attached to Melicia. There were a number of times when she paused and waited for Melicia’s words of encouragement like, “Go on.” and “You can go in there” before she began to play something.

After spending more than an hour in Playscape, they were ready to have lunch. I led them to the museum cafeteria and interviewed Melicia while they were eating. It was a relatively short interview that lasted only 15 minutes, because her answers were very brief, for example, I asked, “How do you know when she needs your help?” Her reply was, “I just know.” It could also be because they were my first family and I hadn’t had enough experience in conducting an interview. Yet, I got to know them and their lifestyles a little bit more.

Melicia and Mica visit the museum on a yearly basis. At home, they mostly do their own things. Mica either plays by herself or plays with her cousin and other kids in the same neighborhood. As Melicia explained, “I played with my iPad and she played with her tablet. She also played with Sophie the First [a Disney doll]. And she usually plays with her 8-year-old cousin. Besides that she also played with shoes. She would give them names and played with the household.” (Melicia, 05-21-14, p. 9) Outside the playtime, Melicia also does writing practices at home with Mica, specifically teaching her letters of the alphabet.

**Maria and Ethan**

Maria and 3-year-old Ethan visited the Playscape three times, two of which they went to the museum with the father and Ethan’s 9-month-old brother. On the first visit, I told Maria that I had a hard time understanding what the children said in the previous observations. She warned me right away that it might be even more difficult to understand Ethan, because he got an ear
infection between 6-month-old and 1-year-old, which impacted his speech development. Despite his speech problem, Ethan frequently communicated with Maria in all three visits.

In the first visit, there were many instances when he was unable to describe the objects or situations, so he mostly pointed at them. In contrast to the second and third visit, he tended to talk a lot more, although some utterances were incomprehensible to Maria. During the course of 5 months, I saw a huge improvement in his speech, as I recognized many of his words and better understood what he said on the third visit. Maria explained to me that they just changed to a new speech therapist and hoped that his speech would keep improving.

Ethan spends most of his time at home with Maria, who is a stay-at-home mom. He hasn’t attended preschool, so interactions with children at his age are limited to those at the church, where his family goes twice a week for Bible study. Therefore, one of the main goals for Playscape visits is for him to develop his social skills like “he’s not pushing other kids… and learning to share” (Maria, 05-27-14, p. 26). Maria further explained, “I'm hoping that my son [understands] how to express ideas with another child [and] knows how to address the situations. The more interactions he has with other children, I think the better prepared he'll be since we don't know if he's actually gonna go to preschool” (Maria, 05-27-14, pp. 26-27).

Ethan’s favorite subject is art and Maria does a lot of art activities with him at home. He particularly enjoyed coloring and thus learned color names when he was one and a half years old. His father, who also loved art and took all the art courses offered in college, might also be another source of inspiration for Ethan. At the time of the first Playscape visit, the father was working on pin striping his motorcycle. In addition, his father built a play set for the boys in the backyard and also played superhero figures with Ethan.
Besides their playtime, Maria said that Ethan loves reading. They usually have bedtime stories unless something comes up and sometimes they go to read at the library. In addition to a monthly visit to the Children’s Museum, they also love going to a zoo, where Ethan got to hold a snake for the first time. Ethan has toy snakes at home and it is his favorite animal. The theme of snakes and worms also came up when he played with Play-Doh® at the Art Studio in Playscape.

**Orlena and Tehila**

Orlena and Tehila also made three visits to the Playscape within a period of 4 months for this study. Even though it was quite a short length of time, I was able to see a few changes in the way Tehila behaved. I remembered the first time when I met with them at the bottom of the ramp, Tehila reminded me so much of Mica, the first girl in the study, because of her shyness. She rarely spoke a word with me and when I was present, she even used “baby talk” with her mother, Orlena, who was in her sixth month of pregnancy. Orlena called it “baby talk,” because she spoke so softly that it was hard to hear or comprehend. Orlena explained that Tehila was not her usual self. “She's more reserved today. She doesn't just run away and do her own thing like she usually does. Usually she just comes in and goes to something, but today she seems like she needs a little warming up.” (Orlena, 06-06-14, p. 25) Despite her shyness, Tehila was very friendly and smiled at me a lot.

A month later I invited them to revisit the Playscape and they accepted my invitation. On the second visit, her pregnancy was noticeably further along. It was also difficult for her to catch up with Tehila, who ran around full of energy. Although Tehila used “baby talk” at the beginning of the visit, she became more at ease with me later and we were able to have a small chat during the interview, when Orlena felt some abdominal pain, possibly due to her pregnancy. Orlena had to excuse herself to the restroom twice and left Tehila with me at the museum cafeteria. I waited
for Tehila to finish her lunch and asked her if she wanted to play a game with me while we were waiting for her mother. She smiled and nodded. I picked an online preschool story game for Tehila, because I thought that it would be something that she was used to and interested in. She chose an adventure story and went through four pages with me before Orlena returned. Orlena apologized to me that she would not be able to continue the interview because her pain worsened. She suggested that we could continue our conversation on the phone. I quickly wrapped up and helped her put the food tray away and walked both of them to their car to make sure that she was all right.

Three months later I called Orlena and invited her and Tehila back to the Playscape. I asked her about her newborn and she told me that she had a baby girl. On the day of the visit, Orlena left her newborn at home with her family, but she did not have time to drop her 14-month-old baby, Bree, off at the nursery, so she brought her along with Tehila. Although Bree was not part of the original plan, her presence allowed me to see another aspect of Tehila and perhaps better understand how a “normal” visit with more than one child might look like. Orlena had to balance her attention between the two children. She let Tehila choose where she wanted to play at the beginning and then at the end she asked Tehila to bring her baby sister to the Babyscape and showed her how things worked. Tehila was no longer just a 5-year-old girl, but she had become the “big sister” who needed to guide and care for her younger sister.

One thing I found prominent throughout the three visits was that Orlena highly values education. She often looked for opportunities to pose challenges and assign tasks for Tehila to complete while she was playing. Orlena explained to me, “Instead of just having fun, I wanted her to be learning while she's having fun. That's the best way to learn, the best time to learn,” (Orlena, 10-17-14, p. 28) She often works on reading and spelling with Tehila. Every night they
have a bedtime story together and Tehila has reached the point where she can read some of the smaller books by herself. Orlena also did some spelling activities at different areas in Playscape with Tehila on both the first and third visits. Her emphasis on early literacy also reflects her love of reading and writing. At the time of the study, she was also pursuing a bachelor’s degree in journalism with a major in public relations.

Since Orlena needs to attend classes four days a week and works part-time on the weekend and some weekdays and her fiancé works full time, both Tehila and the 10-month-old go to a preschool and a nursery on weekdays. Nonetheless, whenever she has time and energy, she brings her children to the museum or the zoo, usually with her sister and her niece, who is roughly the same age as Tehila. Otherwise they stay indoors and play word games and board games like Candy Land and Guess Who. Tehila also entertains herself with the Xbox Sonic®, which is one of her favorite games so far.

Katie and Ally

Katie and Ally is the family that made two visits to the Playscape for this study. On the day of the first scheduled visit, I remembered vividly that Katie walked down the ramp with a redhead girl, who was full of energy. The 4-year-old Ally looked healthy with her pink cheeks. She wore a neon pink T-shirt and colorful plaid shorts. I also noticed the Disney princesses on her shoes and pointed that out to have a small chat with her so that she could warm up to me a little bit. Katie was very easy-going. She told me that Ally has a speech problem, but they are working on it. She added that Ally’s 2-year-old sister has been a good influence on her. Now that her sister speaks a lot, Ally tries to speak more.

Although Katie describes Ally as an introvert, I felt most connected to her because she held my hand within the first five minutes of our encounter. As we were walking to the entrance
of the museum exhibit area, she held her mother’s hand on the right and then slipped her left hand into mine and continued walking. It was the most surprising and memorable moment in the study. During her play in Playscape, she also looked for me as she was moving to a new area. There was one time that Katie asked her to explore other areas in Playscape. As they were leaving the Music Studio, Ally turned back to me and said, “Come on. Let's go.” I smiled back at her and said yes. She understood that I would be following her from behind, so she continued walking ahead with her mother.

Another thing I noticed in the two visits was that Katie highly values imagination and tries to inculcate her girls with imaginative play. She explained, “We don't do a lot of Internet stuff. I have them use their imagination. I did put TV on for them in the background like if I'm trying to clean the house and they're kind of in my way. I'm like, ‘Here, watch this movie.’ But we do a lot of imagination, playing outside” (Katie, 06-07-14, p. 25). Consequently, Ally is full of imagination. She was the only child in the study who pretended to be making a tasty soup at the Creek exhibit in Playscape, while others sailed boats or used fishing nets to catch fish.

Both Katie and her husband worked full-time Monday through Friday, so both children go to daycare during the day. On the weekend, they try to go out to spend some family time together either on Saturday or Sunday. They usually visit different parks near their house. Katie’s parents have a boat and rafts that the children can get into, so they go to the beach in Indiana if they have time. They also visit the Children’s Museum 2-3 times a year and Katie typically goes to the museum with the children.

When they are outside, Ally and her sister usually play right beside each other, but at home Ally prefers to play by herself. She has three dollhouses and little figurines and makes up pretend play. Ally also loves art and plays with Play-Doh® a lot. Katie reads bedtime stories to
them. Ally cannot read yet, but recognizes some letters and numbers. Her favorite book is *Chick-a-Chick-a-Boom-Boom* and the *Frog and Toad* collection.

**Sam and David**

When I scheduled a visit with Sam on the phone, she told me that she would bring her 3-year-old son, David to the Playscape. On the day of the visit, I expected to see her and a little boy. Instead, there were four of them, Sam, her husband, David, and his 9-month-old sister. I was also surprised to see David because he looked as tall as a 5-year-old. He did not speak much. Sam said that he only utters words and doesn’t speak in sentences yet, so they are in a process of finding him a private tutor. In addition, they also do speech therapy for 15-20 minutes per day with him at home using the applications on the iPad, such as, alphabet games, names of animals, and math games. As a result, David likes doing things digitally.

In addition, they also do a lot of puzzles. Sam likes to read early American literature. She usually reads two short children’s books a day to him due to his short attention span. But from time to time she would bring out the chapter book, *Thousand Leagues Under the Sea*, and try reading it to him. Sam said that he knows all his letters, shapes, and colors and he can read. Her only concern is his communication skill, since he doesn’t speak in sentences.

Sam, who is in her 20s, is a full-time student. She is studying for a bachelor’s degree in science and nursing with a minor in psychology and her husband works full-time. Consequently, David has to go to daycare three times a week during the semester. Since her husband provides the only income in the family, Sam explained to me that her parents help them out a lot by letting them rent a place for a reasonable price. The family seems to have a close relationship with Sam’s parents. She said that David is very close to her father, because her parents often take him traveling with them as far as Cancun, Mexico.
Besides his family, David also gets a chance to play with kids his age when Sam organizes play dates at home. The kids usually play toy cars and with the Little People®. Sam added that David loves playing with all kinds of vehicles. His interest in vehicles was also noticeable when he played with plastic boats for a long time at the Creek in Playscape. Moreover, David also likes to play with Legos and Lincoln Logs at home, but most of the time he enjoys building tall structures and knocking them over. That is how he plays with blocks at the Blockopolis as well.

**Mikaela and Marcus**

On the day of the scheduled visit, a woman with dark brown hair walked down the ramp towards the Bumble Bee. She was pushing a 2-seat stroller with a boy, who looked like a 5-year-old, in the back seat, while the front seat was empty. She asked me if she might be the person whom I was waiting for and introduced herself. She then introduced her son to me, “This is Marcus,” who was actually 3 years old. Mikaela had a high school diploma and used to be a work-at-home mother until she had three children and then it became too much for her to continue working. She had been a stay-at-home mother for over a year.

I was surprised to learn from Mikaela that Marcus has a speech delay, because it would make him the fourth child in the study with a problem with speech development. She told me that it would be difficult for me to understand what he said and that she often repeats what he says so that he can hear the right way of saying it. During the Playscape visit, Marcus seemed frustrated. He yelled and screamed a lot when Mikaela tried to get him to move away from something with which he still wanted to play. When Mikaela tried to calm him down by holding him on her lap, he hit her many times. Mikaela explained to me at the end of the visit that he was born with a heart murmur, which makes him get tired easily if he exerts himself. Whenever she
sees some signs such as heavy breathing or getting sweaty, she has to get him to sit down for a while. Nonetheless, she said that he was particularly frustrated on that day because he did not have a good sleep the night before.

They visit the Children’s Museum once a year, as she usually waits for her husband to go together as a whole family. However, her husband works 6 days a week and on his day off she tries to get him to rest. The last time they went to the museum was 8 months ago and this Playscape visit was Marcus’s and her first time in the newly renovated Playscape. On this visit, Marcus seemed to enjoy the water feature the most. In addition to the museum, they also go on a yearly trip as a family to attractions like Holiday World and Indiana Beach.

At home Marcus plays with his sisters. He has more disagreements with the 8-year-old, because when he gets rough, she does not want to play with him and he would get upset. On the other hand, he is very close to and protective of his little sister, because they are only 12 months apart. Besides his siblings, he also plays with cousins and occasionally with children of his dad’s friends. Mikaela said that he is at the age that he has to learn to share, but she thinks that he is already getting that at home. What she hopes to get from museum visits is for him to see things that spark his interests and get some ideas of how different things work. I was fascinated with how Mikaela interacted with Marcus on the first visit, so I called her a few months later to ask whether she would like to participate in the study again. Unfortunately, she was unable to do so because her daughter was sick and she needed to take care of her.

**Brooke and Luis AND Ben and Hannah**

In this section, I introduce two parent-child dyads together, because they are a family. Brooke responded in the demographic survey that she has 5-year-old twins. When we spoke on the phone to schedule a visit, she asked whether her husband could join and pair up with one
twin while she goes with the other child. I agreed to that, because I thought it would be interesting to observe children from the same background and, more importantly, have a father take part in the study.

Brooke is a stay-at-home mother, while Ben works full time as an engineer. She usually brings the twins and her youngest son to the Children’s Museum 2–3 times a year and Ben might join them once a year. They normally spend a whole day in the museum and nearly an hour in Playscape. On the day of the scheduled visit, Brooke decided to pair with her son, Luis, and Ben paired with his daughter, Hannah. Luis and Hannah are both tall and thin with blonde hair. They looked similar, but not alike. Hannah was very independent, yet calmer than Luis. They had just finished preschool and started kindergarten in the fall of 2014. Both of them were verbal with their parents and I could understand most of what they said. Nonetheless, Brooke said that Luis receives speech therapy and is still working on his words.

In addition to the museum visits, Brooke also encourages them to play outside. Sometimes they go to a park to bike or go swimming at a nearby pool. Otherwise, they also have a playhouse and a sandbox in the backyard. If they stay indoors, the twins usually play by themselves. Luis likes to play with his dinosaurs and Imaginext® toys, while Hannah plays with her kitchen set and does art activities like drawing and coloring. Ben joins their play sometimes when they want him to do so. Brooke, on the other hand, normally plays with the children at home. She tries to go to gym if she has spare time, which, she said, “is almost non-existent recently” (Brooke, 06-28-14, p. 15).

Ben explained to me in the post-visit interview that the twins are used to climbing in a climbing structure on their own, because they usually do that at local restaurants with play areas. Ben said that he preferred to play with Hannah at the Reaction Contraption and the Blockopolis,
Angela and Mira visited the Playscape on the fourth of July. I can remember it clearly because Mira wore a Fourth of July costume. She had a royal blue-ribbon hair clip on her long dark blonde hair. It went very well with her red top, the royal blue and white stars on her tutu, and the American flag leggings. Another thing that made Mira stand out from other girls in the study was her lower voice. I asked Angela at the beginning whether Mira was sick, but Angela said she didn’t know because the kids went to stay with their father for a week and she just got them back in the morning. She later revealed during the interview that she is a single mom to five kids. On the day of the visit, Angela also brought her 2-year-old and 6-year-old sons along with them. Besides the three kids she brought to the museum, she also has an 11-year-old son and a 13-year-old daughter, who usually help out with the young ones. The 6-year-old is often paired with the 11-year-old, while Mira often plays with the 13-year-old sister.

Although an iPad is available at home, the children don’t get a lot of electronic interactions. As a preschool teacher, Angela encourages her children to do more hands-on activities so that they can exercise their fine motor skills. For example, Angela allows them to play with a turkey baster at the water table at home, so the young ones can exercise their finger muscles as they are squeezing. Similarly, Angela also provides both rubber stamps and natural materials for Mira to practice stamping and then draw on them, which is one of her favorite activities. Angela reasoned, “It really strengthens the muscles for early writing” (Angela, 07-04-2014, p. 31). As a single mom, she told me that she doesn’t have free time for herself. She tries to integrate housework into children’s play; for example, she lets the kids play with shaving
cream in the shower with different scrapers and toys, because the kids not only have fun making designs on it, but her shower also gets cleaned.

In addition to playtime at home with their siblings, all of her children, except the baby, are in school. Mira not only goes to preschool, but she has play dates all the time. Moreover, each child has his or her own extra-curricular activities, for example, 6-year-old Jack plays soccer and baseball and Mira dances. Angela brings them to the Children’s Museum once a month. They also visited the Magic House in St. Louis, where they climbed the 3-storey beanstalk, which is similar to the climber in Playscape.

**Melah and Marvin**

Melah has three children, a 19-year-old, a 17-year-old, and 3-year-old Marvin. Her two daughters have already moved out and her husband works full time, so during the weekday Marcus only stays at home with Melah, who is a stay-at-home mother. Nine months ago, Melah and her husband started bringing Marcus to the Children’s Museum every Sunday to let him play. Melah explained further,

I haven't really had a chance to do a lot of things with him 'cause he's been to the emergency room probably like 54 times since he [was] born for different things…right now he's on 9 different medicines. 'Cause he has asthma, so he's on a breathing machine twice. He has 3 inhalers that I carry with me. (Melah, 07-06-14, pp. 29-30).

I was surprised to learn that he had been so sick, because he seemed very energetic and danced a lot, as we were walking up the ramp to the Playscape. However, after walking for a while, he asked her to carry him. She told me that he also has a weekly therapy for his legs, because they are not as strong as they should be.

On the day of the scheduled visit, Marvin also brought a 6-inch Iron Man® figurine with him to the Playscape. Melah said that he brings toys everywhere he goes. After the Playscape visit, they went to the dollhouse on the fourth floor and continued to the ScienceWorks
exhibition. At the water feature in the ScienceWorks, he took a few action figures out of his pant pockets to do a pretend play by himself while I interviewed Melah. Melah added that since he is going to turn 4 soon, she lets him decide where he wants to go in the museum so he can become more independent. In addition, she also hoped that he would learn to share and interact with other children his age at the museum, because he is usually at home all day by himself and has not had many chances to play with other children.

At home he seems to be equipped with everything he wants. He has a kitchen set and a cable television in his room. He has electronic games, but he prefers playing with his action figures by setting scenario plays by himself. Melah plays with him when he asks her to, for example, pretend cooking with him. She said that Marvin is really attached to his father. They play soccer and other things together. When his father has a day off, he sometimes takes Marvin out to have one-on-one time together. In addition to play, Melah also reads to him and is also trying to teach him how to write. He can recognize his name and can count to 16. He knows the shapes and the colors. Melah said that she does not have much free time, but if she does, she reads a bit or plays some games on her phone.

**Sarah and Alice**

On the day of the scheduled visit, Sarah walked down the ramp and greeted me first. She introduced me to her 5-year-old daughter, Alice, who has long dark blonde hair. She wears a T-shirt with a picture of two seahorses and a pair of neon yellow leggings. A few moments later a tall man with a cap walked towards us with a 15-month-old boy in the stroller. Sarah introduced her husband and her son to me. She apologized for being late as they just went to register Alice for kindergarten. Alice was shy at the beginning. She asked her father to hold her and did not
respond to me when I talked to her. But later when she saw me at the cafeteria after the Playscape visit, she waved her hand to me and gave me a big smile.

Sarah brings her children to the Children’s Museum on a monthly basis. In Playscape, Alice was the only child in the study who put on an animal costume and took on the role of a fish in the Pond area. She pretended that her mother was going to catch her. Sarah explained that Alice loves pretend play and she is familiar with the idea of using the fishing pole to catch fish, because they have a KoPi pond at home and Alice has a fake fishing pole to play at the pond. Besides pretend play, Alice also loves drawing and sometimes does chalk drawing on the sidewalk. Sarah feels that Alice is really artistic and therefore, whenever they visit the Playscape, Sarah tries to persuade Alice to explore the Music Studio in order to broaden her artistic skills to another domain. Unfortunately, Alice has not shown much interest in the musical instruments.

At home, the only electronic device available for Alice is an iPad. However, Sarah restricts her electronic interaction to only half an hour a day, because she prefers Alice “to be out in the real world” (Sarah, 07-07-10, p. 23). Consequently, they play a lot outside in the yard, where she has a small slide. They also go out for a walk and play Frisbee™ and balls at the park. In addition, Sarah, who works as a certified yoga trainer, also encourages Alice to do yoga. Sometimes when Alice sees Sarah do it at home, she will get her little mat and join her.

**Molly and Jacob**

Molly was the only grandparent in the study. She brought her 4-year-old grandson, Jacob, to participate in the study. Jacob is well articulated and well behaved with Molly. Molly did not elaborate on her answers to the interview questions and it was also more difficult to concentrate on the interview because they continued playing at another exhibition. As a result, I learned only a little bit more about their background. Jacob, his 2-year-old sister, and his mother live with
Molly. Since Molly and Jacob’s mother both work two days a week and on weekends, they take turns looking after the children, but sometimes, like the day of the scheduled visit, the father also helps babysit the baby.

Jacob does not have many friends his age. His interactions with other children are limited to the summer time when he frequently goes to the pool, where he gets to know children from different ethnicities, mainly Hispanic, African-American, and Burmese. Consequently, one of the goals for museum visits is for him to interact more with other children. Nonetheless, Molly asserted that he is good with sharing. At home, he usually watches cartoons, plays with Legos®, and other everyday things. They used to have a rabbit, but they just got rid of it, so they have only a dog and a cat in their residence.

**Chapter Summary**

In this chapter, I introduced twelve families, who are members of the Access Pass program and participated in the study between May 21, 2014 and July 8, 2014. The majority of the information was gathered from my conversations with the parents prior to the Playscape observation and in the post-visit interview. The description of each family encompasses information regarding their living circumstances, for example, learning resources and toys available for the child, extra-curricular activities, and parent-child interactions at home. These descriptions enable me to make sense of their interactions in Playscape and to see how the parents help the child make connections between his or her museum experiences and those outside the museum walls. The next chapter focuses on nine exhibit areas in Playscape. It also includes interviews with the museum staff, which elaborate on the design rationale of each exhibit area.
CHAPTER 5
DESCRIPTION OF PLAYSCAPE

The Playscape exhibition at the Children’s Museum of Indianapolis (TCM) is the case of this study in which I investigated parent-child interactions. In order to provide a vicarious experience of being in Playscape to the reader, this chapter will present a detailed description of each exhibit area in Playscape from a perspective of a visitor and a researcher. The background information of design elements and rationale gathered from the Playscape planning document, Conceptual Design: Early Childhood Experience (TCM, 2011) and interviews with museum staff represent perspectives of the internal entity who have prolonged engagement in the design and conception of the Playscape.

The Playscape is located on the third floor of the museum. Families can either take an elevator or walk up the ramp to the third floor. The first thing that families see at the entrance of the Playscape is a small kiosk, where an interpreter is always stationed to greet Playscape visitors. The interpreter will also remind parents to park their strollers at the designated spot along the left wall and not to bring any food into the Playscape. If the family also comes with a child aged 6 years old or over, the interpreter will assign the child to be a “helper,” which means that s/he will assist her/his younger sibling(s) and let them play first.

As soon as the family walks past the greeter, they will see a 4-foot-tall partition wall with the Playscape sign. The low wall enables parents to see different areas in Playscape. On the left side, there is an area with a giant tree full of green leaves called the Babyscape. It is designed for infants and toddlers. The Babyscape is the only area in Playscape that is surrounded by low walls

4 Except the Babyscape, because it is designed for infants and toddlers, who are not in the target group of the study.
in order to prevent young children from running away from their parents and to protect them from older and bigger children. Since the target age range of the study is between 3 and 5 years old, the Babyscape is excluded from the study. Nonetheless, there were a couple of times when the child in the study wanted to go to the Babyscape to either see her/his younger sibling or to briefly explore the area behind the closed door.

If the parents look straight over the partition wall, they will see a big waterfall, which is the hallmark of the Creek. Behind the Creek is the Pond, where there are two red boats at the top of the lily pond and children can climb up the lily pads to the boats. The three areas at the back of the Playscape that are out of sight from the entrance of the Playscape are the Sandbox, the Art Studio, and the Music Studio. The right side of the Playscape features four small areas in the Invented World: the Blockopolis, the Whirly Twirly Tower, the Race n’ Roll, and the Reaction Contraption. Each of these areas will be described in more detail below. The floor plan of the Playscape can be found in Appendix M.

**The Creek**

The Creek is the first open exhibit area that a family sees when they walk past the low partition wall. The water of the Creek originates from the top of the 7-feet-tall giant cliff at the back of the Creek and then falls down into a plunge pool below. The height of the retaining walls of the plunge pool are nearly 2 ½ feet tall, so there is a small step at the front of the pool so that children can reach out for things in the pool. The pool splits into two streams; the right stream has two levels and the left stream has three levels. The lowest level of the left stream is a 1½ - feet-tall circular pool, which has a clump of reeds in the middle that are out of a child’s reach. There are various sizes of rocks in the streams. The exterior of the Creek and small rocks in the streams have a bumpy, yet smooth surface that mimics river rocks, which have been smoothed
over time by the current of the river. The colors of the Creek are based on colors in nature, for example, both sides of the streams and the small rocks are greyish brown with tiny minerals’ colors of reddish brown, blue, and white and the reeds are emerald green.

*Figure 5.* The photograph shows labels of the exhibit elements at the Creek.

There is a small pathway underneath the cliff, which allows families to walk behind the waterfall and go back and forth between the left and the right stream. Above the plunge pool, there is a rain cloud, which pours down at intervals and often triggers parent-child conversations. When families arrive at the Creek, children are quickly drawn to a wide selection of toys at the Creek, for example, plastic fishing nets, grey toy fish that look similar to catfish, colorful plastic boats, clear measuring cups, colanders, red ladles, and turkey basters. Parents will notice that there are smocks available on the other side of the partition wall for the parents to put on their children to protect them from getting wet at the Creek. There are also two hand dryers next to the smock hangers for families to dry their hands after they finish playing at the Creek.
**Design rationale of the Creek**

The exhibit developers designed the Creek to resemble a real stream that families can find in nature in order to provide children an opportunity to connect their museum experience with an outdoor environment. In order to make a stronger impression of nature, the exhibit development team also installed floor-to-ceiling windows, which not only allows natural light to flood into the exhibit space, but also includes trees, birds, and the sky outside of the museum into the exhibit landscape. The Playscape designer, expounded on the design rationale:

> It’s just…affording us to give [an] experience that could then be connected to, maybe, get back to nature, when they’re at home in their yard or in a park. (Staff 1, 05-08-14, p. 2)

In addition to developing a sense of nature-connectedness, young children can also learn properties of water by observing the flow characteristics of water in the two streams (TCM, 2011). For example, children may notice that water flows downstream from the waterfall to the circular pool and that water flows rapidly at the waterfall and through a narrower channel due to the steep slope and due to an increase in water pressure, respectively. They may also notice that the water slows down as it flows into the circular pool, which is a small body of still water.

The exhibit developers also provided a variety of toys to not only encourage pretend play but also enable children to investigate properties of water and properties of objects in water (TCM, 2011). For example, there are different sizes of measuring cups. Children can investigate how many half-cups they need to use to fill up a one-cup measuring cup. Children can also experiment with different objects to see, for example, how they can make a boat sink and float. In addition to cognitive development, parents can also teach young children how to use a baster in order to strengthen their fine motor skills.
The Pond

Figure 6. The photograph shows the “underwater” view of the Pond with two boats at the top.

The Pond is located behind the cliff towards the left side of the Creek. It is designed to represent “an underwater ‘pond’ habitat” (TCM, 2011, p. 21). Figure 6 shows the “underwater” view of the pond as if families are walking at the bottom of the pond and approaching this water lily structure. Each green pad in the structure represents a giant lily leaf that floats in the water and the green poles represent stems of the water lily. The climbing structure and the boats are enclosed with strong safety wire net. Children, and even adults, are encouraged to “climb up a transparent, bubble-like structure to ascend to the surface and gain a different spatial perspective… [at the top of the boats]” (TCM, 2011, p. 21). Altogether there are nine openings, where children can climb in and out of the climbing structure. Depending on the route children take, they need to climb up between seven and nine lily pads before they reach the top of the structure where two red sailboats are “floating on the water’s surface” (TCM, 2011). Each of the
boats can accommodate approximately 2 – 3 children. There are a few dead ends in the climbing structure, but children can easily climb back down and change their route. On the ground in the middle of the climber, there is a pathway where adults can walk into in order to get closer to their child, who is climbing in the structure.

The lily pads are made of strong wood, which has dark greyish green rubber covering the top of the pads and is painted in light green at the bottom. In order to prevent children and adults from bumping their heads at the hard leaves, there is black rubber on the edge of the leaves where children have contact with and there is also thick black foam at the bottom of the leaves in the middle pathway. At the back of the cliff, where the waterfall originates, there is a small costume station with a child-sized half-body mirror. The thin panels on the sides of the mirror show three types of animals: an eastern painted turtle, a leopard frog, and a bluegill, that children can transform into when they wear the animal costume vests, which can be found in the box in front of the mirror.

**Design rationale of the Pond**

The multi-level climber is designed to help young children practice motor skills, “reconnoitering and planning, spatial orientation…and risk-taking for confidence building” (TCM, 2011, p. 22). In order to climb up the structure, children need to exercise not only their body muscles, but also their critical thinking in orienting their position in the climber relative to the whole structure in order to decide on their next move and the route they are taking to go up to the boats. Despite the sign on the climber encouraging parents to climb up with their child, the designer voiced out her initial concern with the lack of parental involvement due to the relatively small opening areas in the climber.

My greatest fear was that it wouldn’t fit in the family learning model that there would be a disconnect from the kids and the parents because kids were in the
climber climbing and parents were down here. Surprise. Surprise. A lot of parents are going into the climber...but now the kid’s been up there once or twice, they don’t do that any more, I don’t know. But that was something I noticed.

(Designer, p. 8)

Since the study was conducted nine months after the Playscape was reopened to the public, the designer’s statement may explain why parents in the study did not climb into the climber.

In order to enhance parental scaffolding, the pathway in the middle of the climber enables parents to stay beside their child and guide the child to ascend to the boat, where s/he can see the whole exhibit space from the highest angle of the Playscape. The exhibit designer elaborated on the design rationale of the climber:

Also because we fashioned the Climber in such a way that it has a walk-through, a path through it, parents can better follow along with their child and help them and go, “Oh, up on this one now. Come on. This way and then you can get to the boat,” and “Oh, dead end. Turn around.” But there’s a lot of involvement that way where the parents are walking along side their child as their child is ascending into the Climber and then the kids, I think, it’s very important for them to feel that sense of victory for them is “I made it all the way to the boat. Hey! Look at me! I’m up here. So high!” And then they get the whole different perspective of the exhibit they’ve just been going through. So, now we’re starting to teach them about different points of view and what that means, beyond developing their physical ability and mobility and teaching them to judge risks in a safe way.

(Designer, pp. 8-9)

In addition to those critical skills, the costume station at the Pond is intended to promote pretend play and foster children’s interest in a freshwater habitat. Children can take on different roles of freshwater animals and “swim” through the water lily “pond”.

The Sandbox

The Sandbox is located right next to the climber in the back corner of the Playscape, where there are floor-to-ceiling windows. The Sandbox consists of two keyhole-shaped sandboxes, one is in front of the blue Flight paintings and the other is in front of the Hands-Can sensory station. The walls of the sandboxes are 23 inches high so that it can keep the sand inside.
Turquoise tiles with pictures of animals are covered in sand at the bottom of the sandbox. These pictures include a duck, turtle, fox, and doe at the sandbox by the Flight paintings and a beaver, birds and bees, raccoon, bass, shells, rat, trout, and rabbit at the sandbox by the Hands-Can. At the sandbox by the Hands-Can, there are photographs and text signage in both English and Spanish saying, “If we dig here, what do you think we’ll find?” to hint at the digging activity to parents.

Figure 7. Sandbox by the Flight paintings.  
Figure 8. Sandbox by the Hands-Can.

In addition to the animal tiles, the sandbox by the Flight paintings also has two round spinning tables that go round constantly and the Pour-a-Pattern table, where families can observe a pattern when they pour sand over the top of the table and wait until the sand goes down the holes. Furthermore, there are also different types of tools for families to play with such as, stamping tools, tin cans, sieve pans, funnels, wooden shovels, and scrapers. The texture of the sand is ultra fine and looks sparkly when the light shines through the window onto it. However, this special type of sand can diffuse into the air easily when many children play at the sandboxes.
**Design rationale of the Sandbox**

In fact, the Sandbox was not part of the original plan of the new Playscape (TCM, 2011). However, the feedback from parents given before the Playscape was closed for renovation showed that the sand table was one of the most desirable features in Playscape. Thus, it was added into the plan with some improvements, particularly the availability of mobile seating.

We learned...that visitors really, really, really wanted [the sandbox] and so we made that larger, put that more on a nature theme and amped it up from the old one, which was basically the containers, filling, pouring, sifting and stuff like that. We had all that still, but now we have some seating built into the sides of the sand feature where parents can sit there right next to their child, we had the mobile seating that they can pull up to the edge with them. (Staff 1, p. 3)

Mobile seating is the product of prototyping, where an exhibit developer found that the dynamic of parent-child interaction increased vastly when parents were able to sit closer to their children around the sand table compared to when the bench was placed two feet away to the back of the room. Knowing that, they prototyped the use of mobile seating prior to the renovation of the new Playscape.

We went to the extent of adding some seating, smaller seats that parents could easily move around and what we found was when we weren’t so busy and there was space for adults to come up and be at the sand table with their child, they would pull that seat up and be up there with them. (Staff 1, p. 3)

In addition to the seating, the exhibit development team and the designer enhanced parent-child interactions and their play experience by adding interactive elements that encourage a sense of discovery and exploration. For example, families can dig up the tiles together and have a conversation about the animals and their habitats. Parents can look at the sign above the Pour-a-Pattern table and ask their children to observe the pattern in the sand.
The Blockopolis

Figure 9. The photograph shows woodblock models and the building area.

When families enter the Playscape, the Blockopolis is located on the right-hand side of the Creek. One of the two distinctive features is the block model of the Children’s Museum of Indianapolis on a small semi-circular table, which is situated against the wallpaper at the back of the room featuring the blue sky and the skyline of Indianapolis. Here the Soldiers and Sailors Monument and the Chase Tower, the tallest building in Indiana, are presented side by side in the background, while the foreground shows single-story and double-story houses in various colors. The other feature is the block-building area, where there are three lower tables and stools and a tall building centerpiece. The sign on the centerpiece states, “Please do not build on models,” which suggests to families to build their own structures at the lower tables. Around the centerpiece, there are four green containers, in which families can find woodblocks that come in different shapes, for example, cubes, round wood sticks, Y-shaped sticks, flat pieces, and blocks with colored cellophane. The centerpiece and the museum model are mostly built with short,
thin, flat pieces, which are glued together to secure the structure. On the opposite wall of the skyline, there is a low mirror wall with two photographic cutouts, in which a mother says, “Look how tall your tower is! Let’s count the blocks 1…2…3…4. Can you add more?” and the other mother asks, “What shape are we holding? What will happen if you put this block on top?”

**Design rationale of the Blockopolis**

The revival of block play in Playscape stems from recent research findings, which show that young children progress through seven stages of block play\(^5\) from carrying blocks in children ages 2 – 3 to building structures in ages 3 – 4 to engaging in dramatic play with the structure in ages 5 – 6 (TCM, 2011, p. 20). The Playscape interpreters were trained to assist children to develop into the next level of block play, as one of the interpreters explained,

> There's like different cognitive levels [or] developmental levels of playing with blocks. I think the first of knowing that you can transport a block from point A to point B, so a really little baby would be like, "Oh, I could actually change where this block is on the table." And then it's making patterns horizontally with blocks and then you start building towers and then you'd realize, "Oh, if I make two towers, I could put a block on top of them to make a bridge." And then it just progresses from there. So, [it's] kind of helping kids make that next step. Even a kid who's making a full house, you may say, "Oh, tell me a story about what you're making or something." (IN, 06-23-14, p. 5)

In some occasions, interpreters also brought out additional props such as little wooden cars and trucks to further promote dramatic play.

The Blockopolis is designed based on a theme of cityscape. The Indianapolis cityscape mural and block models of the museum and the tall centerpiece serve as a source of inspiration for families to transform the two-dimensional mural into three-dimension block buildings. The exhibit designer also pointed out that the bigger models like the centerpiece are built to catch

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parents’ attention so that they will participate in the block play with their children. Furthermore, the photographic cutouts on the low wall are intended to give examples of how a parent initiates a conversation and potentially scaffolds a child in a block building activity.

The Whirly Twirly

![Figure 10. The photograph shows the Whirly Twirly Tower.](image)

The Whirly Twirly is located between the Blockopolis and the Reaction Contraption. The round glass tower with a glass dome has plywood frames to support its structure. The tower has two child-sized openings, which families use to enter and exit the tower. On both sides of the openings, there are two stereo-like wooden boxes outside of the tower, which suck the air into the tunnels and release the wind inside the tower. There are also blue line stickers showing the direction of the wind in the tower. Behind these wind tunnels, families can find goggles and colorful sheer fabric on the black metal carts. Above the cart, there was a sign saying, “Please wear goggles inside the Whirly Twirly Tower” to prevent dust from getting into children’s eyes. The 5-foot diameter of the tower can potentially accommodate up to eight children and a few
adults; however, the optimum number is approximately four children and two adults so that they have room to pick up scarves from the floor and throw them up in the air.

**Design rationale of the Whirly Twirly**

The exhibit development team and the designer decided to add the Whirly Twirly into the Playscape, because it offers not only a full body experience in the wind tower, where families can feel the wind passing through, but also an opportunity for them to use scarves to experiment with the air motion and air flow in the tunnel. The design enables young children at all developmental levels to participate in this experience.

The big success [of the Whirly Twirly] is... a full body experience. [P]arents could take their baby in there and they could have the full body experience and feel the wind. You know, just like how people sometimes would blow in a baby’s face to get a reaction or something. But that’s as much as the baby’s going to get out of it is like “Whoa, there’s wind.” Where a toddler in there, they could get in there and they’re going to be looking at the scarves flying around and that’s all they’re doing. They might just sit there and they can feel their hair blowing around and they have the full body experience, but they’re just, they’re tracking the scarves. Next level, I guess, would be, “Oh, wow, if I grab the scarf and wave it around in my hand, look at the wind. It’s moving it. And I’m hanging onto it.” And then the next one would be “Oh, look! If I let the scarf go and let it go here, goes around here, if I let it go up here, it will twirl up here.” I don’t remember if we still have different materials in there or not, but at one point, we discussed having two different weights of scarves so that the ultimate level would be “Oh, look, this scarf works way better than this material, so I’m going to use this one. It’s just getting them to make these more decisions where they are even making decisions beyond just having an experience and going through a thought process, a little bit with that. (Staff 1, p. 5)

Despite the initial plan of providing different types of materials for families to experiment with the effects of materials and their weights on the movement of the scarves, only one type of material was available on the carts in different colors. As a result, families could focus on one specific challenge, which was to make a scarf twirl around the tower. The task of making a twirling scarf was not as simple as it sounded. It also required families to perform a few trial-and-errors to get a scarf to twirl a full round.
The Reaction Contraption

Figure 11. The photograph shows the front view of the Reaction Contraption.

The Reaction Contraption is located on the left side of the Creek in the same area as the Blockopolis and the Whirly Twirly Tower. The Reaction Contraption is a ball machine that consists of three compartments as shown in Figure 11. At the right compartment, there is a hole on the right side that sucks a ball upwards. The ball will fall into the blue pin wall on the left and then drop into the tubes at the magnetic wall below. The components of the right compartment are similar to those of the left compartment, where there is a hole on the left side that sucks a ball upwards, but instead of the pin wall, the ball falls into a translucent spiral tube and exits at the light blue 90° elbow pipe. On the right side of the spiral tube, there are dark green pipes and a clear gutter that are fixed onto the glass wall. Both the fixed arrangement of the pipes and the spiral tube lead to the magnetic wall beneath. The magnetic walls at the right and the left compartment comprises different types of pipes, for example, 90° elbow pipes, 60° elbow pipes,
and coupling pipes. Each pipe has a magnet at the back, so it attaches to the wall. As a result, families can move the pipes around to change the configuration of the ball route.

The middle compartment shares similar characteristics with marble machines. There are three holes: a clear hole at the red path in the middle of the compartment and one green hole on the right and the left side of the middle compartment. On the right side of the red path, there is a blue wheel that, if turned clockwise, will move balls up the blue conveyor to the top where the balls fall into the spiral blue track. The balls will roll down into the green slope and stop at the top of the lowest yellow arrow. The player needs to push the arrow upwards so that the ball falls onto the arrow on the right. S/he needs to push the rest of the arrows up one by one from left to right until the ball falls into the track behind the green hole on the right.

Similarly, if families turn the light green wheel on the left side of the red path clockwise, balls on the green conveyor will move upwards. Once the ball reaches the top, it will fall into the green spiral track below and then rolls onto the green slopes. The ball will get stuck on the second slope from the top. In order to get the ball to roll onto the third slope, families need to push the silver handle up. The ball will then roll onto the third and get stuck at the fourth slope. Families need to push the silver handle up again and then the ball will fall onto the green slope below. Families need to turn the small dark green wheel slightly to the left so that the ball will fall into the green hole on the left. Balls that are fed into the green holes on both the left and the right side of the middle compartment will roll down the track to the wind tunnel at the bottom of the compartment, which shoots the balls up into the green funnels at the top right of the left compartment and at the top left of the right compartment.
**Design rationale of the Reaction Contraption**

The mechanism of the Reaction Contraption is adapted from different models of marble machines, the only interactive of which is to have children feed and track marbles in the machine (Staff 1, p. 4). In order to make the concept of cause and effect evident for young children, the exhibit development team installed clear glass cases at the front and the back of the Reaction Contraption and designed additional features such as multiple tracks, levers, wheels, and magnetic walls, where families have a certain level of control over the course of the ball so that they begin to make a prediction and test their hypotheses regarding the ball trajectory (TCM, 2011). There are many ways that young children with different developmental levels manipulate parts of the machine.

A baby is just happy carrying around one of those balls or holding a ball or putting it in his mouth. That’s part of that Reaction Contraption. If all you’re ready to do is put your ball in like the vacuum thing and track it through the machine and…work on your visual tracking, you’re covered. If you’re a little bit beyond that, you can figure out to put your ball in there, track it, and then go, “Oh! If I do this knob, I could make it go that way instead of that way. And I can control the path of the ball. And then the next stage is you start combining some of those controls and then the ultimate one is where the ball exits the fixed Reaction Contraption that you can manipulate, there’s a magnetic wall where you’re building your own Reaction Contraption. You’re adding onto this. So there’s something for everyone there in that age group. (Staff 1, p. 4)

In other words, the goal of the Reaction Contraption is to add multiple layers into this ball machine in order to provide opportunities for young children and their parents to collaboratively “experiment with science, technology, engineering, and math (STEM)” (Donnelly &Wolf, 2011, p. 19) through creative play with balls and machines.

**The Race ‘n Roll**

The Race ‘n Roll is situated in the back corner of the Invented World next to the Reaction Contraption. It works as an extended ball play of the Reaction Contraption and requires families
to build long tracks by putting foam blocks and different types of small tracks together. The blocks and the tracks can be connected like Lego® studs and tubes on Lego® bricks. Each black foam square block has a small square stud on the top, while each small track has 2 – 3 square holes at the bottom, which can be connected to the stud of the square block. The tracks are turquoise with black foam walls on both sides. There are four types of tracks: short smooth tracks, long smooth tracks, short bumpy tracks, and long bumpy tracks. Another important element for families to play with at this area is the ball, which can be found at the Reaction Contraption and in a basket at the Race ‘n Roll staircase.

Figure 12. The photograph shows the purple stairs and the Roll ‘n Race track.

Design rationale of the Race ‘n Roll

As mentioned, the Race ‘n Roll is another type of ball play, in which families build up their own track. Similar to the Reaction Contraption, the fundamental goal of the exhibit element is to provide a range of activities for children at different developmental levels.

Again the baby could be happy carrying around the ball. The next stage is you just set the ball on one of those sections. And then maybe you set up multiple tracks and you try and you notice how the ball acts differently on the different shape track surface. Or you realize, “Wow, I can link these together and I can make a
big long track.” Or the ultimate would be “I’m linking these together and I’m making the fastest track, because now I’m seeing that the smoother the steeper the surface of this track is, the faster I can make my ball goes.” So, you see, how…it can go from “I am carrying this beautiful little ball” to “I made the fastest track in the world!” (Staff 1, p. 5)

She also emphasized that every element in the exhibit was purposefully designed. In this instance, there are different degrees of slope and two types of track surface for families to experiment with and find out how the degree of slope and the friction of the surface affect the forces and motion of the ball.

**The Art Studio**

![Figure 13. The photograph shows one view of the Art Studio.](image)

The Aesthetic World, which consists of the Art Studio and the Music Studio, is the major addition to this newly renovated Playscape. The Art Studio is located at the south end of the museum, where the natural light is flooded into the space. There are two openings to enter and exit the area: one is by the Sandbox near the Flight paintings and the other is by the Music
Studio. If a family enters at the entrance by the Music Studio, the most noticeable feature is the long S-shape table and wooden stools in the middle of the room for families to do art making. Two art projects and the instructions are available on the table. At the middle of the S-shape, there is a big glass case, which features a variety of natural objects, for example, a giant pinecone, shells, minerals and fossils. When the family steps into the space that is flooded in natural light, they will notice a series of artworks on the right wall. The board by the entrance presents 4 – 5 artworks that families created in the Art Studio. There are a few paper collages, a watercolor painting, and a drawing. The next five pieces on the left are famous artworks, which are presented in a similar manner that includes a reproduction, signage that suggests questions for parents to initiate a discussion about the artwork with children, and a small hands-on piece that can be touched to enhance the use of other senses.

The first famous artwork is the thin and long photograph of Andy Goldsworthy’s *Stone River* sculpture, which resembles the winding of the river. The second work of art on the left is a reproduction print of Georgia O’Keefe’s *Red Hills with White Shell*. On the side of the print, there is a sign saying, “O’Keefe looked at tiny things, and painted them really BIG,” which encourages parents to use the comparative terms to describe the attributes of the objects. Below the sign, there is a real 1-inch spiral shell attached to the wall for families to compare the actual size of the real shell with the shell in the painting. The third piece is a reproduction of Hiroshige’s woodblock print titled, *Whirlpool and Waves at Naruto*. The sign on the side suggests questions like, “Do you see *curved lines* in the print, too? Do you think the water is *still*…or *stormy*? What do you see that makes you say that?” Below the sign there is a 2”x4” shiny plastic block with curvy lines carved on it attached to the wall to aid families’ understanding of woodblock printing. The fourth piece of art is a reproduction print of George
Seurat’s *La Grande Jatte*. The sign on the side states, “Spot dozens of dots! What if...you could see the original painting? Here’s a smaller canvas, painted in the style of Seurat. How many colors do you see? Now, touch the surface. Is it smooth or bumpy?” Below the sign, there is a 5”x7” oil painting reproduction of the same scenery for families to examine and touch the dot texture of the painting. The last set of artworks is composed of three pieces of art: (a) a reproduction print of Albrecht Durer’s *Young Hare*, which is a detailed and realistic watercolor painting of a fluffy rabbit sitting still on the ground; (b) one of Hunt Slonem’s original abstract paintings of a rabbit profile; and (c) Eric Berg’s bronze sculpture, *Running Rabbit*, the texture of which seemed smooth with some lines on the body of the running rabbit in action. A sign that is hung between the first two artworks and above the sculpture states, “One, two, three rabbits and all look different from each other. Which rabbit *can you pet*? Which rabbit *looks like a real rabbit*? Which rabbit *would you like to hold (if you could)*?”

At the back corner of the room there is a small sink and a set of built-in cabinets, some of which have glass doors to reveal natural objects and art-making tools inside. On top of the cabinet, small objects and colored pebbles are kept in clear jars. These clear jars and colorful ceramics are sorted by colors according to the Reggio style of atelier (TCM, 2011). Objects are placed in color categories from maroon red on the far right to scarlet, orange, yellow, and green to ultramarine blue at the other end of the row. On the opposite wall of the three rabbit artworks, there is a clay sculpture portraying a female storyteller sitting with flared skirts. Her body becomes a playground where small clay figures representing children are doing different activities such as shooting an arrow, catching a dog, climbing, and holding a big umbrella for the storyteller. The work is called *Storyteller Under Sunny Skies* by Rose Recos Sun-Rhodes. On the left there is another glass case featuring three colorful animal sculptures: *Beehive with Bees,*
Armadillo, and Manta Ray. These three sculptures share characteristics of fantasy creatures, because they do not resemble the real animals. They reflect the artists’ imaginations through the use of surreal colors and patterns, for example, the beehive is in cobalt blue and the bees are different colors.

The wall at the other end of the room next to the Sandbox is full of small abstract paintings of a rabbit from different angles. If the family continues walking to the left, they will find an opening to the Pond and the Sandbox. Between this opening and the other one by the Music Studio, there are three big glass cases, which feature gourd containers, a long piece of African textile, and Chihuly’s colorful glass sculptures. In front of the case of the glass sculpture, there are two glass panels; one has colorful visual texture and the other one is clear glass with tactile texture. The sign below the panel of the visual textures states, “Can you see through the glass? How does it look different when the light’s on or off?” and the one below the tactile texture says, “Touch the glass pieces. Are they hard or soft? Smooth or bumpy?” There is also a button between these two panels. If a person presses on the button, the backlight of both panels will light up so that she can see the texture more clearly.

In addition to the monthly art projects on the table, the Playscape interpreters also offer an art program twice daily. During the program, there is one lead interpreter and an assistant, who helps giving out smock shirts and art materials to families. The lead interpreter usually asks families to gather around a piece of artwork in the Art Studio. Children will sit at the carpet circles on the floor while parents seat themselves on the stools around the table. The focus of the artwork changes every other month. Nonetheless, lead interpreters follow the same format. First, the interpreter invites children and adults to look closely at the artwork and then asks a few questions about it. Second, s/he follows the script and gives information about the artist and the
Third, s/he introduces the project and the art-making technique that families will use in the session. Fourth, s/he asks children to sit around the table and work on the project. Fifth, s/he demonstrates how to apply the technique with the tools they have at the table. Sixth, children begin working on the project with some assistance from their parents. Lastly, the interpreter concludes the project by giving families an idea of how they can continue working on a similar project at home.

**Design rationale of the Art Studio**

A variety of artifacts in the Art Studio are presented to ignite children’s curiosity and promote family interactions through art talk and art-making activities. Questions on the wall next to the artworks are intended to help parents point out some characteristics of the work to their children in order to expand their vocabularies as well as get them to pay closer attention to the details of the artworks. The Art Studio deviates from traditional art galleries, where sight is the only way for visitors to appreciate the arts, by displaying the tactile elements next to the artworks in order to enhance young children’s appreciation of art through touching and ensure that visually impaired visitors can participate in this experience as well.

It comes down to hitting on as many of those senses and experiences as you can. If you’re doing that, you truly are doing universal design, where anyone can walk away with a meaningful experience. Someone who is sight-impaired could understand what Seurat and his technique is by touching this sample. Or like the Japanese print with the water and we have a wavy tile, where it’s kind of wavy like a wave and cool like water would be. Texture was the big thing throughout this whole exhibit as well. (Staff 1, p. 8)

Besides these small samples on the wall, tactile elements are displayed throughout the exhibit such as the glass samples in front of the Chihuly glass case as well as a small wooden container carved in a form of fish in front of the container case. The wide selection of artworks in the studio serves as a source of inspiration for studio projects; for example, the bee sculpting activity was based on the fantasy sculpture of bees and a beehive and the printmaking project was based
on Hiroshige’s *Whirlpool and Waves at Naruto*. The focus changes every few months so that repeated visitors can explore a new art technique or a theme when they return to the Playscape (Staff 1, p. 7).

In addition to projects that families can do in the Art Studio, the Playscape interpretation teams strive to help families to continue their learning experiences outside the museum walls, as elaborated:

That's one of our goals for growth in the next year is to always try and leave an interaction with an idea for how they can extend the experience. So, if you were doing an art project where you were doing sculpting, saying, "You can make sculptures at home. You can use play dough, or you can use different materials that you find outside to make a...to use to make pattern in your play dough, so you should try that when you get home." So, always trying to give them ideas of "What can I do after I leave the museum?" to continue this learning on at home. (Staff 3, p. 10)

An example is the project of bee sculpting, in which the interpreters gave a handout to each parent at the end of the art program. The handout suggested families to put the sculpture in the oven to harden it and possibly paint the bee either using yellow and black like the honeybee that they can find in nature or using their imagination to create fantasy bees like those ones on the beehive sculpture inside the glass case.

**The Music Studio**

The Music Studio is situated on the right side of the Art Studio. The conventional look of a room with big doors gives a different impression compared to other areas in Playscape, which are more open and encourage free flow of traffic. Nonetheless, the doors of the Music Studio are widely open most of the time, except when the interpreters are preparing for a music program. Upon entering the room, a family will notice a set of Tubano drums, which is placed in a semicircle with a life-sized cutout of a father, a mother and a girl hitting the drums together with a Spanish word bubble. They will also spot an amadinda, which is a big xylophone that more
than one person can play at the same time, on the left side of the entrance. Behind the amadinda, there is also another life-sized cutout of a father holding a mallet and saying to his little girl, “You start and we’ll take turns. I’ll repeat what you play. Let’s try it!”

![Image of the amadinda and the xylophone pod in the Music Studio.](image)

*Figure 14. The photograph shows the amadinda and the xylophone pod in the Music Studio.*

As the family walks further into the space, they will see three round and 1½-inch-tall wheeled pods, where different types of authentic percussion instruments are available with an informational sheet at the middle of the table. One of the pods features three kinds of the mallet percussion family: a xylophone, a metallophone, and two glockenspiels. All of them have the pentatonic scale, which is composed of the notes do re mi – so la – do, omitting “fa” and “ti”. The informational sheet at this pod introduces the names of these three instruments and poses questions like, “What kind of sound do they make? Calming or exciting? Or another sound?” It

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6 For further clarification of the differences and photos of a xylophone, a metallophone, and a glockenspiel, please refer to Appendix N.
also suggests parents to imitate the notes that the child plays and to encourage the child to compose a song. The sheet emphasizes the use of opposite adjectives like play slowly and fast, softly and louder, and notes that are high and low. In addition, it also encourages the use of new words such as melody, title of the song, and composer when a parent speaks to the child about playing the music.

Another wheeled pod is divided into four sections of small instruments that fit in a child’s hands: egg shakers, wrist bells, clatterpillar and frog rasp. At each section, there is a picture and the name of the instrument. The wooden egg shakers do not exactly look like the picture of the plastic ones, but they share the egg shape. One side of the egg is painted in color, while the other side reveals its wooden texture. The wrist bell has 4 bells attached to the nylon wristband. A clatterpillar is made of wooden slats that were connected together with a sheet of leather at the back. When the clatterpillar is rolled back and forth from side to side, it creates a rattling sound. Lastly, the frog rasp is in a wooden three-dimensional form of a frog with ridges on its back. There is a wooden stick in its mouth that can be taken out to rub on the ridges to make a croaking sound. The informational sheet gives a little background of the clatterpillar and instructions of how to play the clatterpillar and the frog rasp, which are unfamiliar instruments to many families. The last pod presents a Hapi drum and a tongue drum. The Hapi drum is a round black steel drum with eight tongues cut radially at the top of the drum. The tongue or slit drum is made of wood in a shape of a hollow rectangular box. The top of the drum is cut into different lengths of tongues to create different tones. The tongue drum has a pair of mallets, but the informational sheet indicates that these drums can be played either with hands or with mallets. The sheet also encourages parents to ask children whether the sounds that they make are calming or exciting. In
addition to the musical instruments, plastic rings with colorful ribbons are available in a basket for families to use for dancing.

In addition to free play in the Music Studio, Playscape interpreters also provide music programs twice a day. During the program, the musical pods are covered and pushed to the side of the room to create more room for families to participate in the activities. Each program incorporates three activities, where families listen to a piece of music or a story, use musical instruments to make beats along with the story, and move their whole bodies with the music. The program usually lasts half an hour. When the music program ends, the Music Studio resumes its original state, where pods are wheeled out to the center of the room and uncovered for continuing experience in music making.

**Design rationale of the Music Studio**

Critical skills that the exhibit development team expected to take place in the Music Studio are auditory localization and discrimination; music vocabulary; three types of preparatory audiation, which consists of acculturation, imitation, and assimilation; and storytelling (TCM, 2011). According to Gordon (2003), preparatory audiation is a process that helps prepare young children to learn and understand music. The process begins with acculturation, which is listening to different types of music; trying to imitate tonal patterns and rhythms; and lastly assimilation by coordinating breathing and body movement with singing and performing. A variety of authentic musical instruments aims to create an environment that assist the learning process of these skills. For example, percussion instruments and the pentatonic scale are selected for this age group, because they are better suited for the motor skill and basic musical skill of young children.

The layering [of music] was with instrument choices in that if [they are] toddlers, they can do that. [She’s hitting the sticks on the table.] They can do the drum. Or
if the parents are knowledgeable enough, they could let a baby have their hand on the skin [on top of the drum] and feel the vibration as well as hear the noise. But we try to pick very basic instruments that are commonly used to introduce music…we went to the extent making sure that all the instruments were within a certain range so that even though they’re not being played together, it wouldn’t sound like an out-of-tune band. No matter what, these are gonna sound alright together, because they’re within [this pentatonic scale]. (Staff 1, p. 6)

In addition to the availability of the musical instruments, life-sized cutouts of family interactions were installed to demonstrate to families how they can play a musical instrument together. These cutouts are specifically designed for families with young children, because the parents of young children usually “end up being virtually consumed with these young little beings darting around” (Staff 1, p. 6). They do not have time to read a long passage. It is essential that the message gets across to them in seconds, for example, both cutouts of parent-child plays at the amadinda and the Tubano drum suggest to parents that they and their children can take turn to lead and then repeat after the other person. In doing so, the child will go through the process of preparatory audiation as she listens to the sound of the musical instrument when her parent hits it and then learn to imitate the sound. Furthermore, parents can introduce the names of the musical instruments and basic musical terminologies to the child. Many of the instruments in the Music Studio originate from other countries and therefore are foreign to family visitors. Parents can look up the name of the instruments from the informational sheet or those written on the pod and read them to the child. Parents can also talk to the child about musical notes and rhythms, for example, the two missing notes at the small xylophone pod.

Besides families’ impromptu performances, the early childhood specialist designed a music program that integrates storytelling and musical concepts into a musical experience based on the work of Dr. Feierabend, one of the leading figures in music education, who advocates for tuneful, beatful, and artful music curriculum for preschoolers.
[Dr. Feierabend] said that all music like lessons or programs for children should include something that is tuneful, so where they're singing or making music with their voice; something that is beatful, so they're making rhythms or patterns whether it's with their bodies or with instruments; and then something that is artful, so something that talks about expressions in music or movement in music.

In our programs now, we try to do 3 activities where we're all trying to get the children to do something where they're moving, or they're listening to music, or they're doing movements to a book, a story, and thinking about how could I move my body in different ways? We go from fast to slow and soft to loud, so exploring those musical concepts and then singing a song…where they're using their voices to create music. (Staff 3, p. 2)

The music program is intended to add more depth into families’ musical experiences by incorporating the use of their own musical instrument, which is their voices; rhythms; and expression into the music they are making.

**Chapter Summary**

In this chapter, I describe nine exhibit areas in Playscape from my personal account as a researcher and present the design rationale through the museum staff’s perspectives. The Creek, the Pond, and the Sandbox constitute the Natural World, which aims to immerse families in a natural environment and provides opportunities for young children to explore properties of objects and develop gross motor skills. The Blockopolis, the Whirly Twirly, the Reaction Contraption, and the Race ‘n Roll form the Invented World, which focuses on basic physics concepts and critical skills in STEM fields, such as predicting, generating a hypothesis, and testing. Lastly, the Aesthetic World, which consists of the Art Studio and the Music Studio, provides a wide range of arts experiences that promote the use of different senses and authentic instruments for families. Cutouts and wall texts are also installed at the exhibit areas to give examples of ways that parents can initiate a conversation about the exhibits with their children.
and ways that parents can participate in children’s play. In the next chapter, I present findings of parental scaffolding that occurred during the play sessions at these exhibit areas.
CHAPTER 6
PARENTAL SCAFFOLDING IN PLAYSCAPE

In this chapter, I present findings based on the primary research question, “How might low-income parents scaffold their preschool-aged children in an early childhood exhibition in a children’s museum?” and the supporting question, “How is parental scaffolding facilitated or constrained by the exhibit environment and the interpretive programs in Playscape?” In order to determine parents’ scaffolding behaviors, I examine families’ play sessions, which start from an introduction of a toy or a task to an initiation of the play exit, in the nine exhibit areas in Playscape. During these play sessions, most parents stayed close to the child to facilitate the child’s play in order to help the child complete the task or enhance the child’s knowledge and critical skills\(^7\) in cognition, language development, social development, and motor skills (Conn-Powers, 2008). In the first half of the chapter, I describe play scenarios of parent-child dyads in the study to illustrate each type of assistance that parents used with their child. It is important to note that one play scenario often includes more than one type of scaffolding behaviors and/or learning and skill-enhancing behaviors. The second half of the chapter responds to the second question through the perspectives of the parents and the museum staff members who were involved with the development and the delivery of interpretive programs in Playscape.

**Parental Involvement at the Creek**

Parents in the study typically introduced a toy, most often the fishing net and the fish, to the child and then stepped back to monitor the child’s behaviors in close proximity. They mostly

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\(^7\) Critical skills for successful school readiness in Indiana encompasses social and emotional development skills, approaches to learning, cognition and general knowledge, language development and physical well-being and motor development. (Conn-Powers, 2008)
stepped in and made “polite commands” (Lindsey & Mize, 2001, p. 174) in regards to “housekeeping” matters such as putting on a smock, reminding the child not to splash water, and drying hands before moving on to the next area. Having said that, whenever there was a teachable moment in the child’s play parents utilized a number of nonverbal and verbal scaffolding strategies to introduce new vocabularies, a set of skills, or a scientific concept to their child.

**Facilitation**

A parent facilitates the child's play by “[setting] up or [modifying the] environment to make it easier for the child” (Beaumont, 2010, p. 87) to work on the task. A common scenario of facilitation is when a parent grabbed a toy that was out of the child’s reach and gave it to him. For example, a parent prepared the play setting by handing the child a fishing net and placed the fish within a range that he was able to scoop it up with the fishing net. Scenario 1 shows one of the instances when a mother Brooke lifted up her son Luis behind the waterfall three times within his 15-minute play at the Creek, because he wanted to touch the waterfall and collect the falling water into his ladle.

**Scenario 1, (Brooke, 06-28-14, p. 7)**

*Luis jumps and tries to touch the waterfall.*

Luis: Mama, (? get me the waterfall).

Brooke: Water? You wanna touch?

Luis: Yes!

*Brooke bends down and lifts him up. She holds him up high. He stretches his hand out and lets the water from the waterfall run through his hand. He smiles.*

There was no specific task or problem for Luis to solve in Scenario 1. He simply wanted to “feel” the waterfall. This sensory experience is crucial for him to learn about different characteristics of water, for example, wet or dry, warm or cold, and fast moving or slow moving.

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8 A polite command is defined as “an initiation that offers [the child] no choice but to comply, but phrased in a polite and courteous way” (Lindsey & Mize, 2001, p. 174).
“Discovering and differentiating these characteristics is a first step in classification, or sorting,” (Gainsley, 2011, p. 2).

**Modeling/Demonstrating**

Another type of non-verbal scaffolding behavior is when parents model or demonstrate how to use a new type of tool or skill to the child. The toy that children were most unfamiliar with at the Creek was the turkey baster. A few parents in the study picked it up and attracted the child’s attention by squirting the water out of the baster. In Scenario 2, Mira had some prior experience with the baster, but seemingly forgot how to use it. Her mother Angela reminded her how to use the baster by squeezing the rubber bulb.

Scenario 2, (Angela, 07-04-14, p. 26)

Mira: Mommy, how do you work that?
*Angela takes it.*
Angela: Squeeze it.
*Angela squeezes the bulb and gives it to Mira. Mira squeezes it, holds the opening under the water, holds the baster up, and squeezes the bulb again. The water is shot out of the baster.*

Angela’s quick demonstration brought back Mira’s memory of how to use it and she successfully squirted the water out of the baster twice. On the second time, she aimed at the reeds in the middle of the pool and was able to shoot the target.

Demonstration is not restricted to the use of new tools, but also includes demonstration of good cultural and social practices. In Scenario 3, Orlena competed with her daughter Tehila to catch fish into their fishing nets. Both of them successfully caught a fish in the net. Orlena modeled to Tehila that she should release the fish back into the water.

Scenario 3, (Orlena, 06-06-14, p. 3)

*Tehila lets go of the net with one fish back in the stream. Orlena holds her net upside down to drop the fish back in the water.*
Orlena: You gotta release them now.
Tehila picks up her net and holds the net upside down. She walks with an empty net to the plunge pool. One minute later, Tehila scoops up three fish in the net at the third level. Tehila: Now release [them]. Tehila holds the net upside down to drop all the fish back in the creek.

After Orelna modeled the behavior, Tehila imitated right away. Even one minute later when she caught three more fish, she also explicitly reminded herself to release the fish into the water.

**Encouraging Prosocial Skills**

Besides good practice in a pretend play session, parents also encourage their child to share toys, take turns, and be considerate when s/he played with or around other children. In Scenario 4, Luis, who was playing with the fishing net, wanted to walk towards the back of the stream, but there was a little girl in his way. He held the net up high so that it went over her head. His mother Brooke rushed to the scene to stop him.

**Scenario 4, (Brooke, 06-28-14, p. 10)**

Brooke: Luis. No. Don't...don't take it over people's heads. You're gonna get her wet. Brooke quickly pulls him back before the water drips onto the girl’s head. Brooke: See, look. What would happen, if I put it over your head? What happens? Brooke holds the net over his head. The water drips over his head. Brooke: See? That's why you don't put it over people's head, goober. Brooke wipes the water off his head.

Instead of explaining to him, Brooke demonstrated a logical consequence of Luis’s action by putting him into the little girl’s position so that he would understand that if the net went over someone’s head, the person would get wet from the dripping of the water. In addition to nonverbal scaffolding, parents used a variety of verbal scaffolding behaviors to enrich the child’s learning experience at the Creek as exemplified below.

**Posing a Task**

In contrast to Wood, Ross, and Bruner’s (1976) original study of scaffolding, in which a task was given to the participants, there was no clearly defined task in Playscape. Thus, parents’
ability to identify and pose a task is a crucial scaffolding behavior that initiates the child’s action.

In Scenario 5, Orelna suggested a boat race to Tehila.

Scenario 5, (Orlena, 06-06-14, pp. 2-3)

Both of them hold the boats in the second level of the left stream.
Orlena: Ready.
Orlena/Tehila: Set. Go.
Both of them release the boats. Tehila pushes her boat with her hand. She jumps as she is cheering her boat.
Orlena pushes hers as well. Both of them laugh. Tehila jumps up and down as she's cheering for her boat, which is slightly ahead of Orelna's.
Tehila: Go, boat! Go. Go, go, go, go! Yes.
Orlena: Go. Go. Go.
Orlena walks closer and moves her hand to make some waves to push the boats forward.
The yellow boat reaches the lower pool before the blue one.

Orlena explained in the interview that she often posed challenges to Tehila to make the task more fun and the set goals tended to engage Tehila in the activities for a longer period of time.

**Hinting**

During the play session when the task was determined and the child showed a sign of struggle or frustration, parents assisted the child by providing a hint or asking a question that made the child reconsider her/his choice of action so that s/he could accomplish the task. For example, Ethan was trying to catch the fish, but it was far out of reach. He turned to his mother Maria for assistance. Instead of catching the fish for him, Maria suggested that he went around the pool to get closer to the fish so that he could catch the fish himself. Ethan followed Maria’s suggestion. He walked around the pool and succeeded in catching all the fish into his net (Maria, 05-27-14, p. 3).

**Verbalizing/Repeating**

Nearly half of the children in the study experience some difficulties with speech and language development. Consequently, the parents often tried to repeat what the child said so that
the child could hear the correct way to pronounce the words or sentences. In Scenario 6, Sam asked her son David to name the objects while he was playing at the Creek.

Scenario 6, (Sam, 06-13-14, p. 5)

*Sam picks up a piece of wood stick from the Creek.*
*Sam:* What's that? What's that?
*David:* Si…sick.
*Sam:* Stick. What's that? Can you see the fish?
*David touches a rock.*
*Sam:* What's that?
*David:* (?) Rock.
*Sam:* Rock.
*Sam points at a fish and picks it up.*
*Sam:* What is that?
*David:* F...fi.
*Sam:* Fish.

Sam pointed at different kinds of objects and asked David to say the names of the objects. Even though David appeared to know what each object was called, he had some difficulties with pronunciation. Sam, therefore, repeated the word right after him so that he could hear the correct way of pronouncing the term.

**Asking Questions**

Besides language skills, parents were also actively looking for teachable moments to expand the child’s general knowledge as well as practice her or his critical thinking skill by asking questions pertaining to characteristics of exhibit elements such as sizes, colors, shapes, and counting. Scenario 7, for example, shows Marcus playing with the fishing net. The mother Mikaela noticed that he was interested in the rocks at the upper level of the right stream. She adjusted the play to include the rocks and asked him to make relative estimates of the size of the net to the sizes of the rocks.

Scenario 7, (Mikaela, 06-18-14, p. 7)

*Marcus puts one hand on a big rock.*
*Mikaela:* Wait, what do you think about the rocks?
Marcus holds the net over the rock and tries to push the rock into the net.

Marcus: Look!

Mikaela: You can’t catch the rock. [The net]’s too small? Look, I bet you can catch that rock if you try.

Mikaela points at a smaller rock. Marcus touches the small rock.

Mikaela: No, with the net! I bet the net would fit over that. Do you think it will?

Marcus puts the net over the rock.

Marcus: I catch it!

Mikaela: Yeah! It does fit. Can you find any more rocks that will fit on? Do you think it will fit on this rock?

Marcus points at a big rock and swings up the net. The net doesn’t cover the rock.

Marcus: No, it won't.

Mikaela: It’s…it’s too big? But what about this one? Would it fit on this one?

Mikaela points at the smaller rock. Marcus swings the net up again and holds it over the rock. The net covers the rock.

Marcus: Small.

Mikaela asked Marcus to predict whether other sizes of rock would fit in the net. Although he did not state a prediction, he experimented and found the answers by doing it.

Similarly, Maria also encouraged Ethan to make a prediction about the property of the plastic boat in the water. In Scenario 8, Maria asked her son Ethan to predict whether the boat would sink or float.

Scenario 8, (Maria, 10-29-14, p. 5)

Maria: Hey, Ethan. Does the boat…sink or float?

Ethan: Float, mom.

Maria: It floats? Can you put [it] down in the water and show me? Set the boat on the water and show me.

Ethan picks the green boat out of the net and puts it on the water.

Maria: What if you fill it up with water, will it sink or float?

Ethan: Float!

Maria: Still float? But it sinks a little bit, doesn't it? Why do you think…

Ethan pushes it down under the water and then holds it up in the air and pours the water out.

Maria: D’you think having the water affects the [? heaviness] when you have all the water in here?

Ethan: Yeah! Yeah.

Ethan answered correctly the first time, so Maria challenged him by adding a condition of filling up the boat with water and asked him to make another prediction. When his second answer was
wrong, she referred to the physical object and concluded the conversation by asking him to consider the weight of the water in the boat. Even though it was difficult to know whether he understood the concept of buoyancy, she made many attempts to introduce a new concept and scaffold his critical thinking.

**Framing in a Pretend Play**

Besides critical thinking skills, parents also encourage children to engage in pretend play by framing an object play in a pretend situation, which requires children to use their imagination and engage in symbolic play (Vygotsky, 1978). In Scenario 9, Katie initiated the pretend play by asking Ally whether she was making some soup.

Scenario 9, (Katie, 06-07-14, p. 3)

Katie: Are you making some soup?
Ally: Soup.
Ally lets go of the boat and picks up a measuring cup. She scoops up water into the cup.
Ally: Here. Some soup. With the water.
Ally pours the water into the colander. Ally picks up a ladle.
Ally: Soup. It’s yummy!

It is noticeable that Katie only led Ally into the pretend play, but did not involve herself in the play further. The play lasted only about a minute, when Katie asked Ally if she wanted to explore another area in Playscape and Ally agreed to do so.

The only father in the study, Ben, on the other hand, engaged in the pretend play with his daughter Hannah in more depth. He posed a task for her to catch a fish and then introduced an idea of having the fish for dinner in Scenario 10.

Scenario 10, (Ben, 06-28-14, p. 8).

Ben picks up a fish from the left creek. He puts it in the water in front of Hannah.
Ben: Here. Catch a fish.
Hannah scoops up the fish.
Ben: Are you gonna eat the fish for dinner?
Hannah: Yeah.
Hannah sees another fish at the left side of the left stream.
Hannah: More fish.  
*Hannah walks there and scoops up the fish. Ben follows her to the third level.*

Ben: Here. Our fish are dirty.  
*Ben takes the net from Hannah and holds it under the waterfall. Hannah laughs.*

Ben: We're gonna wash it off. Here you go.  
*Ben gives it back to her.*

In addition to the suggestion of eating the fish, Ben also pointed out the necessity of cleaning the fish to prepare it for dinner and demonstrated the process of cleaning the fish by holding it under the running water. After that he returned the net to Hannah and let her continue with her play.

After a child spent a fair amount of time at the Creek, most parents encouraged the child to move on to another area in Playscape.

**Parental Involvement at the Pond**

Due to the child-sized structure of the climber, the designer expressed her concern of the lack of parental involvement and thus designed a path under the climber, where adults can be right next to the child who is climbing in the structure. In my observation, I had never seen any parent climb in the Pond. Most parents stood nearby where they were able to see the child. They usually moved closer to the climber when the child called for them or showed a sign of frustration such as crying or pausing on the same lily pad for a long period of time. The degree of parental scaffolding varies from child to child. Parents provide little or no guidance to older children who are familiar with the climber. However, little ones who have little or no experience of climbing in a big structure may need to have their parents close by.

**Minimizing Frustration**

Young children often felt nervous when they reached the third or the fourth level. When that happened, most parents walked to the middle path to stand right next to the lily pad where the child was to provide further assistance.

Scenario 11, (Mikaela, 06-18-14, pp. 22-23)
Marcus climbs up the second lily pad. Mikaela stood next to the lily pad he is on.
Mikaela: Do you think you can go really really high?
Marcus: Yeah.
Mikaela: You can go higher.
Marcus looks up and then puts his leg on the next lily pad. He looks at Mikaela.
Marcus: (? Do I...I go higher?)
Marcus sounds like he is about to cry.
Mikaela: It's okay if it's too high. You wanna climb out?
Marcus starts crying and sits on the second level.
Marcus: Yeah. Mommy. Mommy!
Mikaela: I'm right...I'm right here, honey.
Mikaela holds his hand as he is climbing out of the climber.

In this scenario, Marcus became nervous when he was the second lily pad. Mikaela stood close by at all time not only to encourage him to move higher, but also to comfort and guide him out when he was ready to leave.

**Recruiting Interest**

Another scaffolding method is to recruit the child’s interest in working on the pre-defined task. In Scenario 12, this was the second time for Orlena and Tehila at the Playscape after its renovation. Tehila had never reached the boat before. In the previous visit she climbed up two levels and then climbed down because she was scared. Since there are many notable scaffolding behaviors in this play session, I divide it into small parts to illustrate each assisting behavior. In Scenario 12, Part 1, Orlena noticed that Tehila was interested in the climber.

Tehila looks at the Climber.
Orlena: You climb all the way to the top, to the boats?
Tehila gets in.
Tehila: Where's the boat?
Orlena looks and points at the boat on the top.
Orlena: Look. Right here. See it?
Tehila steps back and looks at the boat.
Orlena: All the way up there. I want you to climb as high as you can.
Tehila: Okay.

Tehila took on the challenge and climbed up toward the Pond, but one of the smaller openings disheartened her (Orlena, 06-06-14, p. 4). She paused for a while.
Connecting to prior experiences

Another type of verbal assistance is when a parent makes a connection between the current activity and the child’s prior knowledge or previous experience so that the child can build on that experience. In Part 2, Orlena convinced Tehila to climb up by relating her experience at the Pond to the playground at a McDonald’s playground to ease her mind. Despite her mother’s encouragement, Tehila had yet found the small opening too intimidating to climb through. She decided to change her climbing route to another entrance.

Marking critical features

On the same attempt, Tehila was only two levels below the boats, but she suddenly got scared of the height. In Scenario 12, Part 3, Orlena pointed out the final step that would make Tehila accomplish the task. (Orlena, 06-06-14, p. 5)

Tehila: I'm scared (unintelligible).
Orlena: All right. Almost there.
Tehila continues climbing up to the second highest level of the lily pads. She sits down and turns to Orlena.
Orlena: Can you go stand up inside the boat?

Since the goal of the climber is to reach one of the boats, the critical feature was for Tehila to climb into the boat. Tehila hesitated between the two boats. This required Orlena to provide further assistance as shown in Part 4 below.

Giving an instruction

Giving an instruction refers to when the parent directs the child through the steps to accomplish the task. An instruction typically includes a full solution of the task. In Scenario 12, Part 4, even though Tehila climbed up to the sixth level, which was very close to the boat, she felt uneasy to climb up further. Orlena walked to the middle path to be physically next to her and guide her step-by-step all the way until she reached the boat.
Scenario 12, Part 4 (Orlena, 06-06-14, pp. 5 – 7)

Tehila insists that she wants to go up the boat.
Orlena: Oh. Then you gotta get back on this one.

Orlena points at the lily pad Tehila was on earlier. Tehila climbs back up.

Orlena: All right. Let's see. What's next?

Orlena walks to the middle path and taps on one lily pad.
Orlena: Try this one.

Tehila: This one?

Tehila puts her hands on the upper level and climbs up.
Orlena: Eh? I'm confused, too. Nope. It's that one and then you get onto the big one and then you're good.

Tehila: That one?

Orlena: Yep. [Giggle] Can you squeeze through it?

Tehila continues climbing up to the top level. She turns to the boat on the right.
Orlena: There is the boat right there.

Orlena points at the boat on the left that is closer to the Sandbox. Tehila just sits down. Orlena walks to the Sandbox and looks up at the boat. Tehila stands up and sticks her head up in the boat.

Orlena: You made it.

Orlena directed Tehila to move from one pad to the next. A unique aspect of this scenario is that it shows the parent’s thinking process in solving the problem. Although Orlena was also unfamiliar with the climber, her prior knowledge enabled her to map out the routes more quickly than Tehila. The ultimate goal of scaffolding is for the learner to be able to perform the task independently and Orlena’s guidance did just that. In summary, Scenario 12 captures the essence of scaffolding from recruiting the child’s interest, maintaining her focus, providing an instruction for her to complete the task, to enabling her to accomplish the task by herself.

Maintaining Attention

In contrast, Katie noticed that Ally was still in a good spirit to keep climbing and finding a path to climb up higher. She used a number of encouraging words to maintain Ally’s attention to climb as high as she could, for example, “Go, Ally!” or “You can do it. You’re a big brave girl” (Katie, 06-07-14, p. 18). Similarly, when Tehila was about to give up and climb down, Orlena said, “You’re already half way there. Keep going.” (Orlena, 10-17-14, p. 5).
Posing a Task

Six minutes after Tehila reached the boat for the first time, she made another attempt to climb from the ground up to the boat. In the second time, Orelna posed a challenge to Tehila and intentionally made the climb more challenging by timing how fast Tehila could climb up the boat. It took Tehila 1 minute 10 seconds to reach the boat without any assistance from Orelna (Orelna, 06-06-14, pp. 10-11).

Hinting

Hinting aims to assist the child to complete a task with little guidance. In Scenario 13, Marvin reached the boat without assistance from his mother Melah. However, he could not make his way down.

Scenario 13, (Melah, 07-06-14, p. 18)

Marvin puts his legs down on the seventh level.
Marvin: I gotta go all the way back down now. How...how did I...how am I gonna go back down?
Melah: You gotta come back down the same way you climbed up there.
Marvin climbs down onto the sixth pad and changes his route to the other way.
Marvin: Where did I came [sic] from?
Melah walks close to the lily pad he is on.
Melah: Come this way.
Melah walks ahead of him.
Melah: Yeah, you could come this way.
Marvin climbs down to the fourth and third level.

When Melah saw that Marvin struggled to climb down, she hinted to him to climb down the same route that he climbed up. His struggle had yet persisted. Consequently, Melah walked closer and suggested a path for him to climb down.

Engaging in pretend play

In addition to the typical play of ascending to the boat, a few parents in the study also incorporated pretend play into the climbing activity with an aid of the animal costumes at the
costume station. Scenario 14 depicts a play session, in which a mother Sarah pointed out the costume station to Alice. The girl looked through the costume box and picked a silver fish vest.

Scenario 14, (Sarah, 07-07-14, p. 11)

Sarah looks at the name of the fish on the side of the mirror.
Alice turns her side to the mirror, looks at herself in the mirror and smiles.
Sarah: Swim through the pond little fish.
Alice climbs into the climber. She turns around to look at Sarah and beckons her.
Sarah: Hello, little fish.
Alice: Catch the fishie. Catch the fishie.
Sarah moves her hands as if she is pulling the rod and opens her mouth.
Sarah: Hook, hook, hook, hook.

Sarah introduced the pretend play by telling Alice the name of the fish and suggested her to “swim through the pond”. Alice advanced the play by telling Sarah to catch her. Their play indicates that they might have gone fishing, because Sarah pretended to be using a fishing rod to catch Alice.

**Encouraging Prosocial Behaviors**

On a busy day, there was high traffic in the climber, where children moved at a different pace and towards different directions. As a result, conflicts and frustration were deemed to happen. In order to avoid any conflict, most parents closely monitored their child’s behaviors and encouraged their child to exhibit prosocial behaviors with other children, for example, a mother Sam asked David to “play nice” and to let a little girl climb through first (Sam, 06-13-14, p. 8). In Scenario 15, a mother Maria explicitly instructed Ethan to pay attention to his surroundings while he was climbing.

Scenario 15, (Maria, 05-27-14, p. 6)

Maria: Ethan, you have to watch where you're going. Yeah, you stepped on a little boy.
Ethan: Oh.
Maria puts her hand through the net wall to pat him on the back.
Maria: Okay? You gotta be careful.
Ethan’s response showed that he was unaware of his action, so Maria reminded him gently by patting on his back and softly asked him to be careful. After spending time at the climber, families usually moved onto the Sandbox as it is located next to the climber.

**Parental Involvement at the Sandbox**

About half of the children in the study were engrossed in the shoveling activity, in which they scoop up and pour sand into another container or object in the sandbox. Many children noticed the animal tiles at the bottom of the sandbox and were interested in uncovering them. Due to the availability of mobile seating, parents generally sat beside the child and got involved in the child’s activity. The level and the type of parental involvement varied from introducing a new tool to engaging in an extensive pretend play with the child.

**Modeling/Demonstrating**

Besides familiar tools such as shovels, tin cans, and pans, children also reached for unknown objects such as funnels, scrapers, and stamping tools. When parents noticed the child’s interest in the new tools, they often stepped in and showed them how to use those tools. In Scenario 16, a mother Melicia demonstrated to their daughters how to use a funnel.

Scenario 16, (Melicia, 05-21-14, p. 7)

*Mica picks up a funnel. She holds the funnel upside down. Melicia takes it from Mica. Melicia scoops up a lot of sand into the wide openings and then holds it up.
Melicia: You do it like this. Put a whole lot in there?
Melicia suggests Mica to put more sand in the funnel. Mica scoops more sand into it and holds it over the Pour-a-Pattern table. The sand flows down the funnel onto the table.*

In addition to using a tool, a father Ben also demonstrated to Hannah that a design could be created without any tools. He held his index finger in the sand on the spinning table. As the table was spinning, his finger created circles on the table (Ben, 06-28-14, p. 4).
Framing in a Pretend Play

A variety of tools at the Sandbox not only led to an exploration of new tools, but also prompted families to engage in pretend play. The availability of round cake pans and rolling pins, for example, reminded a few parents and children in the study of baking. In Scenario 17, a mother Melah and Marvin engaged in pretend play of baking for over 30 minutes. Melah asked him a series of questions about the cake that he was making to enhance pretend play.

Scenario 17, (Melah, 07-06-14, pp. 8-9)

Melah: Okay, so what kind of cake you making?
Marvin: I'm gonna make a sand cake.
Melah: Okay, I'm gonna make strawberry.
Marvin: Okay, I'm gonna roll mine out.
Melah: Are you gonna roll it out? Okay, I'm gonna make strawberry. What flavor you making?
Marvin: I'm making blueberry.
Melah: You making blueberry. Okay, I'm gonna do strawberry. Ready?
Marvin: Yeah.
After about 30 seconds, Marvin fills a pan up with sand and flips it upside down onto the spinning table. He takes the pan off.
Marvin: I'm gonna let it here...cook.
Melah: You wanna let it cook?
Marvin: Yeah.
Melah: Okay, I'm gonna put some decorations on mine.

Marvin started off by making a “sand pie,” which was closely based on reality. In order to enhance the pretend factor, Melah told Marvin that she was going to make a strawberry cake and asked about the flavor of his cake again. Finally, he played along with a blueberry cake. They went through an elaborate process of making a cake from filling up the cake pan and baking to decorating the cake and finally putting a candle at the top to make it a birthday cake.

Connecting to Prior Experience

Families’ insights in the baking process imply that they might have prior experience in baking at home. For example, Orlena asked Tehila if she had used a sifter before when she baked
a cake with her grandmother (Orlena, 07-08-14, p. 6). In addition to the popular theme of baking, a mother, Mikaela, suggested Marcus to engage in a pretend play of playing at the beach.

Scenario 18, (Mikaela, 06-18-14, pp. 24-25)

Mikaela: You can pretend you're digging on the beach. Look. I'll show you something cool. Here. Put your hand right here. Put your hand out.

*Marcus puts his hand on the sandbox. Mikaela uses the shovel to scoop up some sand and pours it on his hand until the sand covers his entire hand.*

Marcus: Oh!

Mikaela: We can bury your hand like we're at the beach.

Mikaela tried to mimic their experience at the beach, where they covered parts of their body.

Marcus was surprised at first, but did not continue the play.

**Providing Information**

Besides demonstrating how to use new tools and exercising their imagination in pretend play, some parents were eager to expand their child’s vocabularies by introducing the names of the tools and the animals on the tiles to their child. In Scenario 19, Maria told Ethan that the object he was holding was a funnel and then Ethan showed an interest in knowing the names of other objects.

Scenario 19, (Maria, 05-27-14, pp. 7-8)

_Ethan touches the funnel briefly._

Maria: Ethan, do you know what that's called? That's called a funnel.

_Ethan points at a small brush._

Maria: I think that was a brush.

_Ethan picks up a small shovel and a brush. Maria points at a tile buried under the sand._

Maria: I see there's a picture on there. You can brush the sand off to see what the picture is.

_Ethan brushes the sand off the tile._

Ethan: Look, here!

_Maria bends down and uses her hand to brush the sand briefly._

Maria: A fox.

Ethan: Fox.
After introducing the term “brush” to him, she also suggested its usage in removing the sand off the tile. Ethan attempted to uncover the tile with the brush, but then changed to use his hand. He called Maria to look at the picture. She enunciated the name of the animal and Ethan repeated after her. Similarly, in Scenario 20, a mother Angela read the name of the animal aloud for Mira.

Scenario 20, (Angela, 07-04-14, p. 21)

*Mira uses her hand to brush the sand off the tile.*
*Mira: Mommy, what does it say?*
*Angela stops and looks at the word under the tile.*
*Angela: Doe.*

Mira saw letters below the picture on the tile, but she could not read yet. Consequently, she asked for her mother’s assistance to read the word aloud.

**Posing a Task**

In addition to expanding the child’s vocabulary, a few parents also tried to foster literacy skills. Orlena incorporated spelling challenges into Tehila’s play. In Scenario 21, she uses her finger to write a word in the sand.

Scenario 21, (Orlena, 06-06-14, pp. 8-9)

*Orlena continues writing the alphabet in the sand.*
*Orlena: What's missing?*
*Tehila looks at Orlena's writing.*
*Tehila: 'I'.
*Orlena: Is that your name?*
*Tehila: Mm-hmm.

It seemed like Orlena intentionally left out a letter in order to make the spelling challenge more fun for Tehila. She also pronounced all the letters aloud before erasing the word.

**Parental Involvement at the Blockopolis**

Both parents and children in the study were often drawn to the tall block centerpiece and a few of them were drawn to the block models of the museum at the back wall. A couple of
children wanted to build on the centerpiece, but the parents needed to remind them not to do so as the sign suggested and to build their own structures at one of the lower tables. The theme of building a house at the Blockopolis was as popular as the theme of baking a cake at the Sandbox. Nonetheless, families also built other structures beyond the urban theme, which was the intention of the exhibit development team. During the process of block building, parents scaffolded their child in a number of ways.

**Facilitating**

Parents facilitated the child’s play by providing the blocks for the child. When the museum was open in the morning, all the blocks were kept in the block containers, which were beyond a child’s reach. If a child wanted to grab the blocks themselves, they needed to climb up the chair onto the table, which was considered inappropriate for most parents. Consequently, parents tended to gather different types of blocks and put them at a lower table for the child, as shown in Scenario 22, Part 1.

Scenario 22, Part 1, (Mikaela, 06-18-14, pp. 3-4)

*Marcus walks to the lower table and climbs up a stool and then onto the table.*
Mikaela: Oh, no. Don’t climb on the table!
*Mikaela holds him down the table and puts him on the stool instead.*
Mikaela: Here you sit on the stool and I’ll hand you some blocks, okay?
*Mikaela stands by the center round table and picks up some blocks*
Mikaela: Look, do you like that one?
Marcus: Yeah.
*Mikaela puts it in front of him.*

Mikaela asked Marcus not to climb up the table to get the blocks. She not only tried to offer him different types of blocks, but when she did, she also verbalized the shapes of the blocks and repeated the term after he pronounced it.
**Verbalizing/Repeating**

These scaffolding behaviors of verbalizing and repeating were apparent throughout their play session at the Blockopolis and other areas in Playscape. Mikaela explained that Marcus had a speech delay. As a result, she tended to repeat what he said very often, because she wanted him to hear the right way of saying it (Mikaela, 06-18-14, p. 1). In Scenario 22, part 2, Marcus had all the shapes that he wanted and thus began to rebuild a structure that he saw on the upper table. Mikaela asked him a number of questions so that he could express himself verbally.

**Scenario 22, Part 2, (Mikaela, 06-18-14, p. 4)**

Mikaela: What are you gonna build?
Marcus: House.

*Mikaela: He puts the long flat piece and the red triangle on the cube stacks.*

Mikaela: A house? That’s a nice house. Who is…who is in your house?
Marcus: [Shout] I-nic.
Mikaela: You…oh, Sonic lives in your house?
Marcus: Yes.
Mikaela: Does [sic] it just Sonic or is anybody else there? Does Amy live there?
Marcus: Yeah. Oh! There’s a trum-ning-gle.
Mikaela: That is a triangle.
Marcus: No. Oh, oh! There’s a red triangle.
Mikaela: There is.

Marcus could not pronounce the name of his favorite character, Sonic the Hedgehog, and the word “triangle”. Thus, Mikaela put the term “Sonic” in a complete sentence and asked to clarify it with Marcus. She also repeated the word triangle after Marcus and he eventually was able to pronounce it correctly.

**Providing information**

Another mother, Maria, who also expressed a similar concern with her son’s speech development, introduced many new exhibit-related terms to him during their play session at the Blockopolis.

**Scenario 23, (Maria, 05-27-14, pp. 19-20)**
Ethan point at the centerpiece.
Maria: They built that. It's a big tower.
Ethan: Big tower? I'll do big tower.
Maria: All right. Well, you could build a big tower if you want.
Ethan: Mom...
Maria: If you want, you can sit on the stool and use this space, Ethan.

Ethan picks up a Y-shape wood stick.
Ethan: That one [unintelligible]
Maria: Yeah. It looks like a “Y”.
Ethan: Like a “Y”? 
Maria: Yep, that looks like a letter “Y”.

Ethan points at the back wall, where there is a mural of city silhouette.
Maria: It looks like a big bunch of building, so it looks like a city.
Ethan: City.

During the play, Ethan either used his hand gesture or picked up objects to express his interest due to the lack of vocabulary. Maria tried to put those objects in words or sentences to help build up his command of language. Ethan was also eager to repeat the words after Maria.

In addition to speech development, parents also assisted their child in developing problem solving skills. Although block building at the Blockopolis is an open-ended play, which allows for multiple outcomes, there is a shared cultural understanding of how, for example, a house would look. Consequently, a few parents in the study tried to help their child to build a house based on their cultural experiences.

**Hinting**

Instead of giving an instruction to a child, parents offered some hints by asking the child questions about the structure of a house. Scenario 24 illustrates a parallel play between a father Ben and Hannah. Hannah explicitly stated that she was building a house. However, her house didn’t match Ben’s idea of a house. Consequently, he gave her a few hints regarding the four walls of a house.

Scenario 24, (Ben, 06-28-14, pp. 14-15)

Ben: What’d you try to build?
Hannah: A house.
Ben: Try to build a house? Okay.

Ben puts four long flat pieces up vertically on the table. Hannah continues stacking small pieces. Ben puts two long pieces on top of the four pieces. He puts two small flat pieces on the two pieces and then stacks the semicircular blue-cellophane block at the top. It looks like a tall building. Hannah continues stacking more flat pieces. Her structure looks like a dam or a wall.

Ben: You like my house?
Hannah: Yeah.

Ben: Hey, where's [sic] your walls? Are you building a house?
Hannah: Yeah.

Ben: Where's [sic] your walls at?

Hannah points at the stack of flat pieces.

Ben: Those are walls? Did they all fall over?

Hannah frowns and then continues stacking the flat pieces. Ben picks up another long flat piece and adds it to another side.

Ben: There. I got another wall. Where're your walls?

Hannah: Right here.

Ben: Where they...how are they gonna get in the house?

Hannah: Chimney.

Hannah stacks up more flat pieces.

Ben: A what?

Hannah: It's a chimney.

Ben: It's a chimney? Okay.

Figure 15. The photograph shows Hannah’s house in the middle and Ben’s house on the right.

Ben erected four pieces of long thin wood blocks as the walls of his house, while Hannah stacked flat pieces horizontally. Ben constantly asked Hannah and made comments about her walls.

Nonetheless, she insisted that the stack of wood was her wall and eventually added a short column on top of the stack as the chimney as shown in Figure 15.
Unlike Hannah, who did not ask for any assistance, Tehila decided that she wanted to build a house and sought help from her mother, Orlena, in Scenario 25. Orlena asked Tehila a series of questions to get her to think about the structure of a house.

Scenario 25, Part 1, (Orlena, 06-06-14, pp. 18-19)

Orlena: What shape does a house have? Maybe, square at the bottom?
Tehila: Yeah. *Orlena places four flat pieces to make a square shape. Tehila watches Orlena.*
Orlena: All right. Now we have a square. We're gonna have a flat house. Okay, you've got a square. Now what shape goes to the top?
Tehila: Triangle.
Orlena: A triangle? Make a triangle there?
Tehila: Huh?
Orlena: Make a triangle. So, we can have a roof on a house. Make one. With the blocks.
*Tehila picks up two wood blocks but does not put it down.*
Tehila: I don't know how to put a triangle there.
Orlena: How the triangle look?
*Tehila puts two pieces up and makes an angle on one side of the square base.*
*Instead of making a 3D house, she is making a 2D house as shown as the first house in Figure 16.*

Figure 16. The picture shows the first house on the left and the second house on the right.

Orlena started off by suggesting and building a square body of a house. Then she asked Tehila to identify a shape of the roof and to use the blocks to make that shape. Once Tehila finished building the flat house, Orlena gave her another task.
Posing a Task

Since both Orelana and Tehila contributed to the first house, Orelana assigned a task for Tehila to build another house without any assistance in Scenario 25, Part 2. Although Orelana did not provide physical assistance, she still asked a few questions to guide Tehila through the building process, for example, Orelana reminded Tehila of another key attribute of a house, which was a door. She also further explained that the function of a roof was to prevent the rain from coming into the house (Orelana, 06-06-14, p. 19). Both pieces of advice help extended block play and related the child’s play to her prior knowledge of a home environment.

A few minutes after Tehila built a flat house, she went to pick up more blocks and returned with a big rectangle block with blue cellophane and a triangle with red cellophane. Orelana suggested using them to make another type of house.

Scenario 25, Part 3, (Orelana, 06-06-14, pp. 19-20)

Orelana: What if we make like a tall house. It'll be longer. We can use the rectangle instead of a square. Look, we can even stand it up. Now your tree is as tall as your house.

Orelana puts the rectangle piece up and then puts the triangle on top making it look like a 3D house.
Orelana: How do you make your house a little shorter? This is like a two-storey house. We want one storey. So, how do you make it shorter?

Orelana takes them apart and tries to reassemble them.
Orelana: Would you need a shorter shape, maybe? So, instead of a rectangle, what could we use?

Tehila: Square.

Tehila puts a square piece at the bottom and puts the triangle at the top.
Orelana: Yep, now it's shorter. Now you have a one-storey house. I guess this house doesn't have stairs or something. With a really tall tree in the yard.

Orelana set a task for Tehila to build a shorter house, which she referred to as a one-storey house.

In order to do so, Tehila decided to use a square block instead of the rectangular piece to reduce the height of the house.
**Engaging in a Pretend Play**

Another way to extend the child’s play is to use blocks in a pretend play scenario. In Scenario 26, a mother, Melicia, started off by building a house. Mica also built her own house and began to add other things to the surrounding area.

Scenario 26, (Melicia, 05-21-14, pp. 15-17)

*Mica puts the round sticks upright near her house.*
Melicia: Is that the tree? Where is the grass?
Mica: I get three trees.
*Mica gets the thin flat rectangles and puts them next to the trees. She picks up more round sticks and stacks them to make tall trees. Mica puts a long flat piece on the table.*
Melia: What's that? Is that the street? You're gonna drive down the street?
Mica: This's a car.
Melicia: That's the car?
*Mica nods and gives one long piece to Melicia.*
Mica: This's your car.
Melicia: This's my car? Okay. This is my driveway.

When Mica added a new element to her surrounding, Melicia framed it in a pretend play scenario and asked whether it was a tree, a grass, or a street, all of which were related to the theme of a house. Melicia also played along and identified the area in front of her house as a driveway. In doing so, Melicia expanded Mica’s knowledge of a house.

**Parental Involvement at the Whirly Twirly**

Most parents in the study noticed the goggles and the colorful scarves on the carts outside the Whirly Twirly when they arrived at the tower. Therefore, they either gave them to the child or asked the child to wear the goggles and take a few scarves into the tower. All parents recognized the task of getting the scarves to twirl around the tower. A few parents in the study entered the tower with the child, while others stood by the entrances of the tower and scaffolded the child from the outside.
**Recruiting Interest**

Even though the task of making a twirling scarf was apparent to parents, it might not be for a child. Thus, some parents explained to the child how the machine operated to recruit the child’s interest in the task. Scenario 27 illustrates an account when a mother, Mikaela, informed Marcus of the mechanism of the wind tunnels.

Scenario 27, (Mikaela, 06-18-14, p. 33)

Mikaela: Do you see where the air is coming from? If you pick up a handkerchief and put them here, then it'll go around.  
*Mikaela stands outside and points at one of the wind tunnels.*  
Mikaela: Over here.  
*Mikaela points at the wind tunnel. Marcus lets go of the scarf at the wind tunnel. It twirls around the tower.*  
Marcus: Whoa! [Laugh]  
*Marcus spins around and looks at the flying scarf.*

Mikaela explained to Marcus that he also needed a handkerchief or a scarf to carry out the task. She further hinted that he needed to put the scarf at the wind tunnel and he accomplished the task within one trial.

**Maintaining Attention**

In some occasions, a child got distracted and played with the microphone instead after a few trial-and-errors at the Whirly Twirly tower. The parent, therefore, had to redirect the child’s attention back to the task, for example, Angela handed Mira the scarf that was blown outside the tower and said, “How far can you get them [to go]?” Mira took it and continued with her experiment at the wind tunnel (Angela, 07-04-14, p. 4).

**Reducing Degree of Freedom**

Although some parents in the study did not enter the tower nor physically experimented with the child, they observed the child from the outside and guided the child through the process of making a scarf twirl around the tower. In Scenario 28, Mira coincidentally succeeded in
making a scarf twirl around the tower at the beginning, but failed to replicate the result. Angela observed Mira’s attempts to make a twirling scarf and noticed that the scarf flew around the tower when Mira rolled the scarf into a ball, so she explicitly gave Mira a hint so that she would focus on one strategy.

Scenario 28, (Angela, 07-04-14, pp. 4-5)

Angela: Did you see that when you roll it up that it went further? Make it into a ball. Roll into a ball and stick it there.
Mira rolls it in her hand and lets it go at the wind tunnel. The wind blows it outside.
Angela picks it up and gives it to her at the entrance. Mira made a few more attempts, but the scarves were all blown outside.
Angela: Are you shooting them out here?
Mira rolls the scarf into a ball and lets it go. It twirls around half the circle and comes out of the tower.
Angela: That went almost all the way around. Pretty cool.
Mira comes out and walks to the cart.
Angela: Are you all done?
Mira: I need them.
Mira picks up a green scarf
Angela: Okay.
Mira rolls it into a ball and repeats the whole experiment two more times, but the scarf either lands near the entrance or gets blown out. Mira picks it up again from the floor and rolls it into a ball. She lets it go and this time it twirls a whole round before landing outside.

Mira closely followed Angela’s suggestion, yet encountered multiple failures. Nonetheless, she persisted until she finally got a scarf to twirl around the tower again.

Modeling/Demonstrating

Parents who entered the tower usually did a parallel play with the child and tried to get their own scarves to fly around the tower. They made many trial-and-error attempts themselves. Once they discovered a strategy for a twirling scarf, they often demonstrated the method to their child. In Scenario 29, Orlena picked up a few pieces of thin fabric and followed Tehila into the tower. They made many attempts to make the scarves twirl, but they kept being blown outside.

Scenario 29, (Orlena, 06-06-14, pp. 12-13)
Orlena: Oh-oh. It blew out. [Laugh with the other female adult]

*Orlena picks up another scarf.*

Adult: (unintelligible)

Orlena: Yep, I think we need' em a little higher.

*Orlena holds it higher against the wind tunnel, and lets it go. This time, the scarf circles on the inside wall of the tower.*

Orlena: There we go.

*Tehila doesn't notice and goes out to pick up the scarves on the floor outside the tower.*


*Tehila enters and tries to hold it against the wind tunnel, but the scarf doesn't twirl and just falls down.*

Orlena: You gotta kind of put it up higher.

*Orlena demonstrates by letting it go at a higher position.*

Orlena: (unintelligible) I'm just gonna hold it in here. It is not working. There it is. Catch it. [Laugh]

*The scarf twirls around the tower again. Tehila stands at the center and circles around herself while tracking the scarf twirl on the wall of the tower. She then holds it up high and lets it go. This time it works and the scarf twirls around very fast.*

In this play session, Orelena found out that if she held a scarf in front of the wind tunnel and at a position above the entrance opening, the scarf would be blown up above the entrance and twirl around the tower. She told Tehila the trick, but Tehila could not make it twirl. Consequently, she showed Tehila how she did it and Tehila was finally able to accomplish the task as well.

**Parental Involvement at the Reaction Contraption**

The Reaction Contraption was very popular among preschoolers in the study. Most of the children were vastly attracted to the sucking tubes on the far right of the right compartment and the far left of the left compartment. They noticed that the balls moved upwards and then fell into either the pin wall of the right compartment or the spiral tube of the left compartment.

Nonetheless, most of them focused on feeding the balls into the tubes. Most parents stayed close to their child and played alongside the child. However, when the Reaction Contraption was crowded with many children, parents tended to stand back and observe the child instead.
Exploring

Since the children were mostly occupied themselves with ball feeding, all of the parents tried to encourage their child to track the balls and explore the mechanism of other parts of the Reaction Contraption, for example, the blue and the green wheel, the yellow arrow levers, and the magnetic walls. In Scenario 30, Ethan had repeatedly collected and fed the balls into the left hole of the middle compartment. Consequently, Maria suggested to him to try pushing the green levers, which were above the left hole.

Scenario 30, (Maria, 05-27-14, p. 17)

Ethan points at and walks to the hole. Maria touches the lever above the hole.
Maria: Hey, Ethan. Did you try all these levers? Look. Push that lever up.
Ethan pushes the lever up.
Maria: And then you gotta do that one.
Maria points at the lever at a lower level.

Ethan followed Maria’s suggestion and pushed the levers up until the ball fell down onto the track below. In Scenario 31, another mother Orelna went beyond asking Tehila to pull a handle. She wanted Tehila to change the course of the ball from the green track to the blue track and track where the ball would end up.

Scenario 31, (Orelna, 06-06-14, pp. 14-15)

Orelna points at the metal handle at the middle hole.
Orelna: Put it here. Set it in there. We want to go down the blue track. We already did the green track. Put it in and let it go down the blue track and see what happens.
Tehila pulls the metal handle to the right and feeds a ball into the middle hole.
Orelna: You're watching it?
Orelna points at the ball that is falling down at the right compartment.
Orelna: You didn't watch it, Tehila. You didn’t see where it went.
Tehila turns that lever and feeds a ball in. The ball falls down into the track.
Orelna: Watch the ball. Where did it go? Where is it now?
The ball is shot to the right compartment.
Tehila: It's up there.
Tehila points her finger inside the middle compartment.
Orelna: Nope, it's right here. It fell out. You gotta have quick eyes.
Orlena asked Tehila to track the ball and pinpoint the location of the ball. Tehila did not watch the first time, but the second time she missed it because the ball was shot up to the green funnel very fast. Orlena then encouraged Tehila to try turning the blue wheel.

**Modeling/Demonstrating**

Despite the fact that there were different ways for children to manipulate the course of the ball, young children did not understand the mechanism of the levers and conveyors and required some guidance from their parents. One way to show the mechanism of the machine was to demonstrate how it worked. For example, a mother, Sam showed David how pulling the yellow arrows up one by one could move a ball up the steps. She struggled to pull the fourth arrow up, but eventually made it. When the ball reached the top of the step, it fell onto the track on the right (Sam, 06-13-14, pp. 1-2).

**Hinting**

Children were sometimes perplexed by multiple steps of the mechanism of the Reaction Contraption. Instead of demonstrating how it worked to the child, parents gave the child a hint to get the child to think more carefully through the steps of the machine. In Scenario 32, Alice wondered how to put a ball on the top yellow arrow. Her mother Sarah suggested her to track the course of the ball in reverse order.

Scenario 32, (Sarah, 07-07-14, pp. 8-9)

Alice: I'm trying to put this in here but I don't know how.

Sarah walks over to Alice.

Sarah: Well, let's think about this. So, if we wanted to go here, we have to start up here, where it comes down from, right? So, you have to work in reverse order. So, see how it's coming down here? Look. There.

**Sarah points at the green slope above the yellow arrows.**

Sarah: Now how would we get one up there?

**Sarah points at the top of the yellow arrows.**

Alice: I don't know.

Sarah: Look, right here. You follow the green one where you put it in there. Then you go...and look. It shoots up.
Sarah points at the green hole on the right hand side. Alice feeds a ball in.

Sarah also gave Alice a nonverbal hint by pointing at the course of the ball, but the idea of reverse order might be too complicated for Alice. Therefore, Sarah moved onto the green track on the far right instead.

**Providing Information**

In order to make the complex process of the machine more comprehensible for young children, many parents asked their child to track the ball and then explicitly explained the mechanism of some parts of the Reaction Contraption to the child. Scenario 33 illustrates another example when a child was only concentrated on feeding the balls into the machine. Ethan did not notice the whole process until his mother, Maria, pointed it out.

Scenario 33, (Maria, 05-27-14, p. 16)

*Ethan feeds the balls into the hole on the left of the middle compartment. When he has no ball left, he bends down to pick up more balls from the tray below and then puts them into the same hole. Maria walks closer.*

Maria: Ethan, did you see where they go?
She puts her hands under his arms to lift him up.

Ethan: Huh?

Maria: Watch when they go up that tube, where they throw up. Watch. Look. Up there. It goes up that tube and then they throw it into there and it comes down. D’you see that?

*Maria points at the ball that he has just fed into the machine. He follows Maria’s direction and tracks the ball from the middle compartment to the left compartment. The ball falls out of the machine onto the magnetic tube.*

Ethan: Ahhhh! Ohhh!

*When he sees that it comes out, he screams with a high pitched voice. Then he picks up two balls and feeds them into the same hole.*

Ethan’s scream displays his thrill of witnessing the whole process of the balls getting shot up and falling into another compartment. He continued to feed more than ten balls afterwards and also observed the rest of the process with continuing excitement.
In Scenario 34, Katie explained the function of the metal handle at the middle hole of the middle compartment to Ally, who had been putting her whole hand inside in order to put the balls into the blue track on the right side of the red path.

Scenario 34, (Katie, 06-07-14, p. 9)

Ally: One, two.

All \textit{bends down to pick up two more balls from the left tray, and feeds the balls into the middle red hole of the middle compartment. She puts her arm into the hole when she feeds the ball into the blue track.}

Katie: Honey, you gotta move this. And that tells you which side you put it on.

You wanna put on the blue, you don’t have to stick your hands down there.

That, you gotta do this.

\textit{Katie pushes the lever to the right to show her how to choose the track using the lever. Ally still puts half of her arm into the hole, but then turns the lever right and left.}

In fact, Katie informed Ally prior to this play scenario that the balls could go into two different directions at the red path. However, Ally did not notice the function of the metal handle until Katie explained again and moved the lever to show it to her.

\textbf{Reducing Degree of Freedom}

Similar to Maria and Katie in the previous two scenarios, Sam tried to illustrate the concept of cause and effect by choosing to explain one simple and observable part of the Reaction Contraption to David. She chose the part where he could easily see the connection between turning the green wheel and the uprising movement of the ball on the conveyor.

Scenario 35, (Sam, 06-13-14, p. 13)

Sam: Look. David, watch.

\textit{David holds the big green wheel. Sam holds his hands to turn the wheel.}

Sam: Look. Look at the yellow ball. We're making it move. When we stop, it stops.

\textit{Sam touches the wheel and turns it with him.}


\textit{He looks up and then at the green track. Both of them continue turning the wheel.}
David seemed to understand that if he kept turning the wheel, the yellow ball would move up the conveyor. He continued tracking the ball as it rose to the top.

**Giving an Instruction**

In addition to informing the mechanism of the Reaction Contraption to the child, some parents gave a full instruction of how to operate parts of the machine. In Scenario 36, Ben guided Hannah step-by-step through the process of moving the ball up the five yellow arrows.

Scenario 36, (Ben, 06-28-14, p. 10)

_Hannah is turning the blue wheel and the ball reaches the top of the conveyor._

Ben: Now look. Here. Raise this up one at a time and see what happens.  
_Ben points at the yellow arrows._

Ben: No. No. No. No. Raise this up.  
_Hannah lifts up the lowest yellow arrow. The ball falls onto the next arrow on the right._

Ben: Now raise this one.  
_Ben points at the next arrow on the right. Hannah lifts it up. The ball falls to the next arrow._

Ben: Now raise this one.  
_Ben points at the next one. Hannah lifts it up and the ball falls to the next arrow._

Ben: Now what? Then it goes to this one now.  
_Hannah lifts it up and the ball falls into the green track._

Hannah performed the initial step of moving the ball up the blue conveyor and down onto the first yellow arrow at the bottom by herself. She followed Ben’s instruction and finally got the ball into the green track on the right.

**Asking Questions**

A few parents attempted to foster critical thinking skill for their child by asking him or her questions about the mechanism of the machine. In Scenario 37, Tehila was turning the blue wheel, which controlled the blue conveyor. Orlena asked Tehila to speculate the final location of the ball on the blue conveyor when the ball reached the top of the conveyor.

Scenario 37, (Orlena, 06-06-14, pp. 15-16)

_As Tehila turns the wheel, the balls move up the conveyor to the top._

Orlena: It’s getting there. When it gets to the top, where's it gonna end up at?
*Tehila points at the green funnel at the top left of the right compartment. Orlena points to the top.*
Orlena: It’s gonna start off up there. And where is it gonna go to? Where is the line end at?
Tehila: In the blue track.
Orlena: Where does it end?
Tehila: Down.
Orlena: Where?
*Tehila points downward.*
Tehila: Right there.
Orlena: I think it ends right here. What d'you think?
*Orlena points at the track inside the middle compartment.*
Orlena: We’ll see.
*Tehila continues turning the wheel. The ball reaches the top.*
Orlena: All right, here comes the ball. Let's see where it goes.
*The ball moves very fast towards the right track of the middle compartment.*
*The ball gets shot up to the green funnel at the top left of the right compartment and then falls down the magnetic wall.*
Orlena: [Gasp] We were both wrong. Look. It's way over there.

Noticeably, Orlena also made a prediction and strongly encouraged Tehila to observe the result as they were testing their hypotheses. The ball unexpectedly landed in the right compartment. Despite the fact that both of them got it wrong, this scenario illustrates that scaffolding in Playscape does not conform to the definition of scaffolding in its original context, in which the adult is an expert on the task and knows how to arrive at the end result. On the contrary, parents experimented and made speculations alongside the child in Playscape.

**Posing a Task**

Another method that encourages a child to try a new feature is to pose a task to the child.

In Scenario 38, Katie assigned a task to Ally to move the ball from the top green lever to the green lever below.

Scenario 38, (Katie, 06-07-14, p. 8)

Katie: Ally, looky!
*Katie points at the ball on the lever.
Katie: You see this ball right here?
Ally is still holding three balls in her hand. She walks to Katie.
Katie: Gotta help it get down to here.
Ally: (Unintelligible)
Ally pushes that lever up, and feeds the balls into the left hole of the middle compartment.
The ball on the lever falls down to another lever.
Katie: Look, right here.
Katie points at the ball on the lever.
Katie: Ohhh.
Ally pushes the lever up and then feeds a ball into the middle red hole.
Katie: Good job.

Ally was very interested in feeding the balls into different holes. However, she still took on the task and pushed the two levers up one by one when Katie prompted her to do so.

**Encouraging Prosocial Behaviors**

In addition to trial-and-error and learning the concept of cause-and-effect, parents also tried to promote prosocial behaviors for their preschoolers. As mentioned, most children were attracted to feeding balls into the sucking tubes. Since there were only two of them available at the Reaction Contraption, children could easily come into conflict or feel frustrated if they could not have their turn. In Scenario 39, Melah served as a mediator between Marvin and another girl.

**Scenario 39, (Melah, 07-06-14, p. 21)**

Marvin picks up more balls.
Melah: Are you gonna put'em up? Whoop, one came back out.
One ball slowly falls back down and out of the hole. He pushes it back in. There is a girl waiting to feed balls into the same tube.
Marvin steps back a little.
Melah: Here. Try that end right there.
Melah points at the left hole of the left compartment.

Melah noticed that the girl was waiting patiently to feed the balls, but Marvin seemed to occupy the tube solely. As a result, she told him to let the girl have her turn and to encourage him to explore the other sucking tube at the left compartment.
Parental Involvement at the Race ‘n Roll

Families in the study spent the least amount of time at the Race ‘n Roll. The maximum time spent in the area was approximately 8 minutes as the family was actually rebuilding the track, while other families stayed there only for a couple of minutes as the child dropped a ball onto the preexisting track. Since most children simply dropped the balls on the track and parents hardly got involved in the play, parental scaffolding behaviors were limited in this area compared to other areas in Playscape.

The type of scaffolding behavior that was crucial at the Race ‘n Roll was facilitating the child to build a long track. Despite the lightweight of the foam blocks and short tracks, the big size of the pieces made them difficult for a small child to carry from the top to the bottom of the stairs. Moreover, children need to have some understanding of size and height estimates to build a long track that a ball could smoothly roll down from top to the bottom. Scenario 40 (Angela, 07-04-14, pp. 6-8) shows a play scenario of the only family who spent 8 minutes rebuilding the track. Although Mira initiated the task, her mother Angela scaffolded Mira in many different ways. Angela not only helped Mira move the foam blocks and tracks around, but also hinted a few times, for example, when Mira connected the bumpy track at the beginning, Angela gave her a hint that the ball would not roll down and she might need to turn it around.

In addition, Angela also asked questions to get Mira to consider a number of blocks they would need to make the bumpy track leveled with the previous track. In the process of using the foam stacks to adjust the height of the track, Angela demonstrated to Mira how she also went through the process of trial-and-error. Even though she did not recognize that the stud on the foam block could be connected to the hole at the bottom of the track, she managed to support the track by putting it between the stacks of the foam blocks as shown in Figure 17.
Figure 17. The picture shows how Angela placed the track between the foams without connecting the stud to the bottom of the track.

Her alternative method also shows that there is more than one way to solve a problem. Finally, when she figured out the new method, she gave Mira an instruction to put two more foam stacks on the other side of the track to fully support it. Being given all these scaffolding behaviors, Mira successfully built a longer track, on which a ball could roll down smoothly from the top to the bottom.

**Framing in a Pretend Play**

Besides the intended activity of building a track, Marcus used one of the long tracks as a prop for his imaginative play. Mikaela reinforced his imagination by framing his action in a pretend play as shown in Scenario 41.

Scenario 41, (Mikaela, 06-18-14, p. 34)

*Marcus bends down and picks up another long track. He puts it on the side and steps on it.*  
*Marcus:* Yeah!  
*Mikaela:* Is it a surfboard?  
*Marcus:* Yeah! Whoa.  
*Mikaela:* Is he balancing his body?  
*Marcus:* He is balancing his body.

During his play session at the Race ‘n Roll, he stepped on the long track twice. The first time was shown above and Mikaela asked whether the track was his surfboard. The second time she also asked him whether he was skateboarding. After she framed it in a pretend play setting, Marcus seemed to express more excitement and even pretended to be balancing himself on the board.
Parental Involvement at the Art Studio

The Art Studio was one of the least frequented areas in Playscape along with the Race ‘n Roll. Six out of the twelve families in the study visited the Art Studio during the observations. Two families participated in the art program, which was led by Playscape interpreters and the art-making activities in which were based on an artwork in the studio. At the time of the data collection, the interpretation team offered two art-making activities: one was bee sculpting based on the fantasy sculpture of the beehive and the other was printmaking based on Hiroshige’s woodblock print, Whirlpool and Waves at Naruto. Although the lead interpreter gave most of the instruction throughout the program period, parents also took part in scaffolding their child during the process of art making.

Modeling/Demonstrating

In Scenario 42, Melicia and Mica participated in the bee sculpting activity. They sat at the table and like other families waited for an instruction from the lead interpreter. An assistant gave each child a ball of clay in a plastic cup and the lead interpreter stood in front of the families to guide them step-by-step to make a bee.

Scenario 42, (Melicia, 05-21-14, pp. 11-13)

Melicia pulls the pressed clay piece off the mat.

Melicia: Rolling this into a ball. Roll it to a ball. Like this.

Mica mimics Melicia’s movement.

When children finish making the body of the bee, the interpreter hands out a plastic pin for them to make additional features such as a smile or stripes on the body. Mica picks up a plastic pin tool.

Mica: Are you gonna make eyes?

Mica nods. She attaches the stinger to the bottom of the bee. Melicia takes the pin tool.

Melicia: Here. Make eyes. When you do eyes, you do like this.

Melicia pokes it in to the head and creates a shallow hole.
Melicia: So, you’re gonna make the other eye. Like this.  
*Melicia gives the tool to Mica. Mica pokes another hole.*

At the beginning of the activity, Melicia demonstrated how to roll a ball between her palms to Mica, who successfully imitated her hand movement and made 3 round balls. When the interpreter encouraged them to use their imagination to decorate the bees, Melicia showed her how to use the pin to make an eye and left the other eye for Mica to finish. In both occasions, Melicia did not complete the task for Mica, but modeled for her so that she could do it independently.

In addition to the art program, families could also engage in art-making activities at any time during the day and at their own pace by utilizing the art supplies that were available at the S-shaped table in the middle of the room. At the time of the data collection, two main projects were featured at the Art Studio: (1) Play-Doh® sculpting in May, and (2) Printmaking with everyday objects in June and July. In Scenario 43, Alice asked her mother, Sarah, to draw a fish, while Alice used a semicircle tube to experiment with printmaking. Sarah suggested that Alice makes fish scales by making multiple prints of the semicircle shape on the fish drawing.

*Figure 18.* The photo shows Sarah’s print illustrating fish scales.
Sarah: You can make like little fish scales, right?
_Sarah presses the end of the semicircular tube on the inkpad._
Alice: What do you mean?
Sarah: Right? Look.
_Sarah stamps the semicircle many times on her drawing of a fish as shown in Figure 18._
_Alice looks at the scales._
Alice: Oh.
Sarah: How fun.
_Alice picks up a colored pencil and then draws on the paper._
Sarah: What're you making? The ocean?
Alice: No, I'm making a fish.
_Alice continues drawing._
Alice: Oh, here, look at my fishie.
_Alice moves the drawing closer to Sarah._
Alice: I think it needs some scales.
Sarah: Ooh, yeah. How do you draw scales? Or do you stamp?
_Alice picks up the semicircular tube and presses it on the body of the fish many times like Sarah did earlier, but the ink doesn't show much on the paper as shown in Figure 19._

Since Alice picked the theme of fish and used the semicircle tube for the printmaking activity, Sarah demonstrated how to make fish scales out of the semicircle shape. Alice was inspired to add fish scales onto her fish later by drawing many semicircles as well as making attempts to print the semicircle shapes on the paper.

Besides art making, a few families walked around the Art Studio to contemplate artworks on the wall and in the glass cases, such as Maria and Ethan, as shown below in Scenario 44.
They were initially walking towards the art table, but suddenly Ethan stopped at the glass case (Figure 20) to look at the shells. Maria employed two types of verbal scaffolding behaviors to build up Ethan’s language skills.

Figure 20. The photograph shows the glass case in the middle of the art-making table.

Providing Information

In Scenario 44, part 1, Ethan paid close attention to the shells and minerals in the glass case. He wanted to talk about them, but lacked a term to describe them. Maria told him that they were called “shells” and explained to him where they can be found.

Scenario 44, part 1, (Maria, 05-27-14, p. 10)

Ethan: Those are...
Maria: Those are different shells.
Ethan: Different shell.
_Ethan looks closely at the case, while still holding his mother’s hand._
Maria: Yep. That's what you would find in the ocean. If you went to the bottom of the ocean, you would find some of those.
Maria introduced the word “shell” by associating it with the ocean. Consequently, Ethan not only learned the new term by repeating the word after her, but also gave him a context of the object.

**Asking Questions**

In order to further enhance his vocabulary, Maria also asked Ethan questions to get him to express himself. In Part 2, Maria noticed that Ethan was interested in other unfamiliar objects in the glass case such as the giant pinecone and colorful minerals. She asked him to identify his favorite mineral.

Scenario 44, Part 2, (Maria, 05-27-14, pp. 10-11)

Maria: Which one do you like?
Ethan: That one.

_Ethan points at the grey one._

Maria: You mean that one? I like that orange one. From here.

_Maria points at the orange shell._

Ethan: That one?
Maria: Uh-huh. You see it? I like that one.
Ethan: Dada like the blue one.
Maria: You think dad likes the blue one? Maybe we'll have to ask him.
Ethan: I like that one and I like this one. I like that one.

In this conversation, they also talked about colors of the minerals: orange and blue. Ethan also guessed his father’s favorite. In doing so, he needed to be able to look from the perspective of his father.

Color, texture, and shape were popular topics in the Art Studio. Parents often asked their child to name those elements of art. In Scenario 45, Molly, a grandmother, utilized the suggested questions on the sign in front of the Chihuly glass case to initiate a conversation about the textured glass with Jacob.

Scenario 45, (Molly, 07-08-14, p. 6)

_Molly walks to the Chihuly glass case and reads the sign below the color-textured glass._

Molly: Can you see through the glass? How does it look different when the lights are on and off?
Jacob pushes the orange button between the color visual-textured glass and the physical-textured glass. The light shines from underneath the glass showing the texture of the glass.
Molly: Which one's blue?
*Jacob points at the blue glass.*
Jacob: It's blue.
Molly: Good job. Which one's yellow? That's my favorite color.
*Jacob points at the yellow glass.*
Molly: Yes. Where's orange at?
*Jacob points at the orange button.*

Molly furthered the conversation by asking Jacob to identify the colors of the glass samples and he successfully pointed out all the colors.

Scenario 46 illustrates an example when a mother Angela asked Mira to describe the shapes of the prints that she made during the printmaking activity in the art program. The lead interpreter demonstrated the steps of using natural objects in printmaking and then walked around the table to assist families.

Scenario 46, (Angela, 07-04-14, p. 16)
Interpreter: Which one of the shapes on your painting do you like the best?
*Mira looks at the prints on her paper.*
Mira: This one.
*Mira points at the marks she gets from stamping the end of the wood stick on the paper.*
Interpreter: You like that one?
Angela: What shape is this? What does it look like?
Mira: Oval.
Interpreter: An oval.
Angela: What's this one?
*Mira points at one of the star fruit's marks.*
Mira: Star.
Angela: This one?
*Mira points at one of the sponge's marks.*
Mira: I don't know.
Angela: What about this one?
Mira: Square.
Angela: Are you sure it's a square? Look again.
Mira: [unintelligible] square.
Angela: It looks like a rectangle to me.
Angela asked a series of questions for Mira to identify other shapes on her paper. She also corrected Mira when she used an incorrect term.

**Engaging in a Pretend Play**

Given the nature of art that provides room for imagination, children often made up a character or a story when they drew a picture or sculpted a piece of clay. In Scenario 47, Ethan was playing with Play-Doh® that was available in clear plastic bags on the art-making table. He rolled the dough into small pieces and attributed a big flat piece as a fish. His mother, Maria, who had been sitting beside him quietly, initiated a conversation about his pretend play.

Scenario 47, (Maria, 05-27-14, p. 13)

_Ethan rolls it on the mat in front of him and then clenches his hand lightly a few times._

Ethan: Ahhhh, the rain monster.

_Ethan then picks up another piece and uses his fingers to roll it on the mat._

Maria: Oh, that's a monster? Is he a mean monster or a nice monster?

_Ethan continues holding and loosening the dough in his hand._

Ethan: Monster over there. Mon over there.

Maria: Monster over there?

Ethan: Yeah.

_Maria moves the big piece of blue Play-Doh®, which is the fish._

Maria: All of the fish gonna protect them?

_Ethan takes it and presses it on his hand._

Ethan: Arghhhh.

_Maria: [Chuckle] Who won? The fish or the monster?_ 

Ethan: Fish.

_Maria: The fish did? Oh, good._

Maria engaged in the pretend play with Ethan by asking him about the monster and the fish that he made up. She used a word like “protect”, which might have influenced Ethan to initiate a fight between the monster and the fish. In summary, demonstrating, providing information, asking questions, and engaging in a pretend play were the most apparent scaffolding behaviors that parents in the study used with their child in the Art Studio.
Parental Involvement at the Music Studio

The Music Studio features a variety of authentic percussion instruments from different countries, which were available for families to play any time, except at noon and 3 pm when a music program took place. Parents in the study usually followed their child closely and played the instruments with the child. They also provided a wide range of scaffolding behaviors to enrich the child’s musical experience. In contrast, during the music program parents generally sat back around the carpet circles where children sat in front of the lead interpreter. Nonetheless, the interpreter highly encouraged parents to join their singing and storytelling activities. Out of the initial twelve visits, only one family attended the music program.

Modeling/Demonstrating

A few musical instruments were completely new to the parents as well as the children. The most familiar instruments for families were egg shakers and wrist bells, which children picked up and played intuitively. Nonetheless, children also showed interests in novel instruments such as clatterpillars, frog rasps, and the Hapi drum. As a result, the majority of the parents demonstrated to their children how to use those instruments. In Scenario 48, Katie showed Ally how to play with a clatterpillar.

Scenario 48, (Katie, 06-07-14, p. 10)

*Ally picks up a clatterpillar and just holds it in her hands.*
Katie: You know how that works?

*Katie walks over, picks up another clatterpillar, and rolls it back and forth to make the sound.*
Katie: Do you like that?

*Katie holds Ally’s hands and shows her the hand movement to create the sound.*
Katie: There you go.

*Katie lets go of her hands and Ally continues moving it back and forth.*
Katie: Called a clatterpillar.

Katie began by demonstrating the hand movement to Ally and then holding Ally’s hands, so she could learn from her own experience. Katie also told Ally the name of the
instrument. Similarly, a grandmother Molly introduced a frog rasp to Jacob by rubbing
the ridge to create a croak sound.

Scenario 49, (Molly, 07-08-14, p. 7)

*Molly picks up a frog rasp.*
Molly: Jacob.
*She rubs the stick on the back ridge of the frog.*
Molly: That sounds like a frog.
*Jacob nods and picks up a frog rasp. He rubs the stick on the ridge. Molly puts the frog back and picks up a wrist bell.*
Molly: There. You do the frog.
*Jacob puts the frog down and touches a clatterpillar. Molly puts the wrist bell down and picks up a clatterpillar. She moves it back and forth to make a sound.*
Molly: Jacob, like this.
*Molly continues moving it back and forth. Jacob takes the clatterpillar and mimics her hand movement. The first time it doesn’t move smoothly, but then as he continues moving it, it begins to move back and forth.*

Moreover, when Molly noticed that Jacob was interested in the clatterpillar, she picked it up and showed him how to move it to create a sound. Jacob struggled at first, but eventually he was able to play both the frog rasp and the clatterpillar.

**Providing Information**

Many parents in the study used the information sheet and the labels available at each instrument pod and shared the information with their children. One of the most common pieces of information that parents shared with their child was the name of the musical instrument. In Scenario 50, Maria told Ethan that the instrument he was playing was a xylophone.

Scenario 50, (Maria, 05-27-14, p. 21)

*Ethan hits a xylophone with two mallets.*
Maria: Do you know what these are called, right?
Ethan: No.
Maria: Xylophone.
Maria: Can you say 'xylophone', Ethan?
Ethan: Ai-fone. [He tries to pronounce the word]
Maria: Uh-huh.
Maria also asked him to pronounce the word after her, however, due to his speech problem, he could not pronounce it clearly and Maria did not correct him.

In addition to the name of the instrument and how to play it, Scenario 51 illustrates an occasion when a mother Mikaela explained the role of materials in musical instruments to Marcus in simple terms.

Scenario 51, (Mikaela, 06-18-14, p. 17)

*Marcus looks at the xylophone opposite his at the same pod.*
Marcus: Hey, I wanna play that!
Mikaela: You can try that one, too.
Marcus: [Shout] I wanna try that!
*Marcus walks to the glockenspiel.*
Mikaela: The different ones will make different noises, if they’re made of different materials.
*Marcus climbs up the stool, picks up the mallets, and hits the xylophone.*

Despite similar appearances of the xylophone and the glockenspiel, the bars of the xylophone were made of wood and the bars of the glockenspiel were made of steel. Mikaela tried to point out to Marcus how materials affected the sound quality of the instrument.

**Asking Questions**

Instead of directly giving information to a child, a few parents asked the child questions regarding the characteristics of the sound to encourage the child to listen more carefully. In the same play episode in the Music Studio, Mikaela also asked Marcus questions regarding the sounds of different instruments and the sounds of different notes.

Scenario 52, (Mikaela, 06-18-14, p. 17)

*Marcus hits the mallets on different bars of the metallophone. Mikaela picks up one mallet and hits a glockenspiel.*
Mikaela: Do they sound the same? Or do they sound different?
*Marcus continues hitting.*
Mikaela: Does that sound the same when you hit this one and this one? Or does it sound different?
*Mikaela points at two different notes. Marcus hits on ‘la’ and ‘mi’ notes.*
Marcus: No.
Mikaela: No? It’s not the same? 
Marcus: Yeah, it is. 
*Marcus hits different notes. He hits harder and harder.*

Mikaela tried to refine Marcus’s listening skills by asking him to compare the sounds of the metallophone and the glockenspiel. When Marcus did not respond to her, she asked him about the sounds of different keys on the metallophone that he had just hit. However, he did not seem to pay attention to the sounds that he made.

Another mother Sarah utilized the suggested questions on the information sheet available at the middle of the tongue drum pod. She asked the exact same questions to Alice.

Scenario 53, (Sarah, 07-07-14, p. 10)

*Sarah picks up an information sheet in the middle of the table and reads it. The sheet suggests some questions, for example, what kind of sound do they make? Calming or exciting? Or another sound?*  
Sarah: This is a tongue or a slit drum. What kind of sound do they make? Are they calming or exciting?  
*Alice shrugs.*  
Alice: Exciting?  
Sarah: [Laugh] Okay.

Alice shrugged and guessed the emotional impact of the sound of music. Sarah simply agreed to her answer and did not pursue the rationale further.

**Posing a Task**

A rare type of scaffolding behaviors in the Music Studio was assigning a task or a challenge to the child. Most parents were comfortable with children’s impromptu music making. However, Orlena had made her point explicit in the interviews that she tried to give Tehila a task to accomplish so that it was more meaningful and fun for her. Scenario 54 illustrates another example of Orlena posing a task to Tehila on her second visit to the Playscape.

Scenario 54, (Orlena, 07-08-14, p. 14)

*Tehila hits the tongue drum randomly.*  
Orlena: Here. See if you can make it sound like mine.
Orlena takes the mallet and hits on two parts in a consistent rhythm. Orlena: Can you do that?

Tehila tries to imitate Orlena, but couldn't replicate the rhythm. Orlena: [Chuckle] Close.

Orlena takes the mallet and hits it again. Orlena: Look. One--two--three-four-five. Can you do it?

Tehila makes another attempt and it creates a similar rhythm. Orlena: Ooh, I see you out, girl.

Orlena holds her hand up to high five. Tehila gave Orlena a high-fives with the mallet.

Instead of random hitting, the challenge required Tehila to not only listen carefully to the rhythm that Orlena made, but also synchronize her hand movement to reproduce the same rhythm.

Tehila succeeded in reproducing a similar rhythm on the second round.

Orlena’s scaffolding behaviors were consistent across the three visits to the Playscape.

On the third visit, Orlena posed another challenge to Tehila at the Tubano drum set as shown in Scenario 55. Her challenge was to hit the drums in a row.

Scenario 55, (Orlena, 10-17-14, pp. 11-12)

At the Music Studio, Tehila walks to the drum at one end and then continuously hits all the drums in the row to the other end.

Orlena: Tehila, that was neat. Do it again. Start on this end. Can you hit each one with one hand one time? Go in a row. Hit it one time each.

Tehila starts hitting the drums.

Orlena: No, you hit this one twice.

Tehila: Uh-uh.

Orlena: You doubled up. Hit each one one time.

Tehila hits six drums in a row from one end to the other.

Orlena: Yep, you did it.

Tehila continues hitting the drums.

Tehila: Ta-da.

Tehila continues hitting.

Tehila: Ta-da. I’m gonna...I’m gonna hit them four times. One.

Tehila hits two drums four times each and then hits in different configurations.

Although the challenge seemed simple, Tehila accomplished the task in the second round. She seemed to unconsciously hit the drums in a specific rhythm, so when she was assigned a task to hit one drum at a time, she had to pay more attention to what she was doing.
Exploring

All parents in the study highly encouraged their child to explore different types of musical instruments. Once a child knew how to play an instrument, the parent usually introduced another instrument to the child to try. As a result, families seemed to move from one pod to another pod very quickly. For example, Katie asked Ally to try the Tubano drums after she ran around the room twice with the ribbon rings on her arms. Ally hit the drum and then ran to the amandinda. She hit it a few times and then rubbed the stick on a frog rasp (Katie, 06-07-14, p. 11). Although Ally and other children who played random music tended to spend only a brief amount of time at each instrument compared to Tehila’s play scenarios (Scenario 54-55), they also got a chance to explore all types of instruments in the room.

Framing in a Pretend Play

In addition to posing a challenge, Orelna also framed their music making activity in a pretend play setting that included all the family members. On the third visit, Orelna also brought along her baby girl, so she could not play freely and engage in a deep conversation with Tehila. Nonetheless, she made up an activity in which the three of them could play together.

Scenario 56, (Orlena, 10-17-14, p. 11)

Tehila moves the clatterpillar back and forth to create the sound.

Orlena: (unintelligible) gonna make music altogether. Have a whole family band. Orelna and Bree hit the drums, while Tehila continues moving the clatterpillar. She then gives it to Orelna and then hits the drums instead. Orelna moves the clatterpillar back and forth.

Orlena: Are we in a band?

Tehila hits the drums really hard in rhythm.

Orlena: Are you a drummer?

Tehila hits a few more times and then walks away.

Orlena proposed to Tehila to play musical instruments at the same time as a band. Tehila joined for a short while and then moved onto other musical instruments.
Connecting to Prior Experiences

Although the Music Studio featured only percussion instruments, Orlena found a characteristic of the xylophone that could be related to Tehila’s prior experience of playing piano.

Scenario 57, (Orlena, 07-08-14, p. 13)

Orlena: Look. You can do it like a piano.

_Orlena picks up a mallet and hits each piece of wood from one end to the other end._

Orlena: See how it goes up and down. You know how on the piano you run your fingernail. You gotta do that with this. You go one-two-three-four-five-six.

_Orlena drags the mallet on the xylophone._

Orlena demonstrated to Tehila that she could also create a glissando on the percussion instrument like on the piano.

Encouraging Prosocial Behaviors

Although there were different types of musical instruments, some of them were available as the only one of its kind in the Music Studio, for example, the Amadinda, the metallophone, and the Hapi drum. Consequently, there were occasions when more than one child wanted to play the same instrument at the same time. An example is when Marcus took a mallet from the adult who was playing the glockenspiel. Mikaela quickly took Marcus away and reprimanded him for misbehavior. Yet, she also offered him an alternative by diverting his attention to other instruments (Mikaela, 06-18-14, p. 19).

In the first section of the chapter, I have encapsulated play scenarios that illustrate parental scaffolding behaviors at nine exhibit areas in Playscape in order to answer the primary research questions. In the next section, I present findings to answer the supporting research question, “How is parental scaffolding facilitated or constrained by the exhibit environment and the interpretive programs in Playscape?” First, I examine post-visit interviews with the parents to find out which features facilitate or constrain parental scaffolding from the parents’ perspectives.
Second, I focus on the construct of scaffolding from the perspectives of the museum staff members, who developed the Playscape exhibition and deliver interpretive programs. Finally, I conclude the chapter with the parents’ interviews, which reveal the purposes of their museum visit and their perception of their role in Playscape.

**Exhibit Features that Affect Parental Scaffolding**

Most parents expressed that the redesign of the Playscape and the signs facilitated their parent-child interactions and family learning. The open area of the Sandbox allows parents to be right next to the child and therefore encourages more parent-child interactions (Sarah, 07-07-14, p. 20). A few parents also found the sign at the Pour-a-Pattern at the Sandbox to be a useful cue that helped them initiate an activity with their child (Orlena, 06-06-14, p. 24). Many parents read the information sheet in the Music Studio and followed the instructions to engage in a conversation and activities with their child regarding different tunes and rhythms that each instrument makes (Orlena, 07-08-14, p. 16; Sarah, 07-07-14, p. 21). One mother in the study, Sarah, felt that the wall texts and information sheet were very parent-friendly, as they provided enough information and suggested what families could do at the exhibit element in a concise way. Also, since many instruments were new for the parents, they also learned the names of the instruments from the information sheet and shared them with their child (Maria, 05-27-14, p. 24). The grandmother, Molly, used the exact same questions on the labels in front of the Chihuly’s glass case in the Art Studio to capture Jacob’s interests in the textures of the glass pieces (Molly, 07-08-14, p. 6).

Nonetheless, some parents felt discouraged to be physically involved in the play at certain areas in Playscape. Despite the sign at the climber stating that parents were welcome to climb with the child, the child-sized structure, as the designer expected, deters parents from
participating in the climbing activity. Katie explained that she decided from the start that she would coach her daughter from the outside (Katie, 10-26-14, p. 18). Similarly, Angela said that she never went inside the Whirly Twirly tower with her children, possibly because the low entrances gave her an impression that it was an area only for children (Angela, 07-04-14, p. 30). Having said that, a couple of parents in the study did join their respective child’s play in the tower.

***Staff’s Interpretation of Scaffolding***

Changes in Playscape are not limited to the exhibit environment, but also involve the way Playscape interpreters deliver programs and interact with family visitors. An emphasis on socio-constructivist theories resulted in a new interpretive practice, which revolves around the idea of scaffolding. The director of early childhood education, who was a previous principal at a Reggio Emilia inspired school, introduced the concept of *Powerful Interactions* (Dombro, Jablon, & Stetson, 2011) to the Playscape interpretation team. The concept is based on Vygotskian perspectives of classroom teachers, who suggest that a teacher needs to perform three steps: (1) Be present, (2) Connect, and (3) Extend learning, when she interacts with a child in order to create a powerful interaction that leads to a process of scaffolding, in which a teacher builds on the child’s prior knowledge.

Each child comes to you with a different collection of life experiences in his or her tote bag. Your job is to find out about the contents of their bags so that you can help children build links between what they have already experienced and the new knowledge and ideas that you want to teach them. (Dombro, Jablon, & Stetson, 2011, p. 133)

In the old Playscape, interpreters interacted with families only during scheduled hours when they delivered programs with rigid scripts. There was little room for interpreters to improvise their interactions to match children’s interests. In contrast, interpreters in the renovated Playscape, who employ Powerful Interactions, were encouraged to join children’s free play in the exhibit
area and model scaffolding behaviors to parents hoping that parents will embrace those behaviors and use them with their children.

Going back to Vygotsky, we know their learning is going to be richer when it’s scaffolded by an adult, especially an adult that knows them very well, because as a parent ...[y]ou’ve been involved in this child’s life for all of his life. You know what he knows already. You know how to bring it to the next level. So, yes, we as a museum staff can ask questions, can try to scaffold that learning, but [if] the parent [is] involved...the learning is going to be a lot more individually differentiated and more real and more authentic. The parent can also keep on scaffolding after the family leaves the museum so they can keep on talking and building upon that experience at home. (Staff 2, p. 2)

The museum staff members strive to encourage parental scaffolding, because parents are able to provide individualized supports to the child and extend their guidance to the child’s everyday life outside the museum context.

In addition, Playscape interpreters perceive scaffolding as a method that an adult uses to facilitate the child through the process of discovery and problem solving, rather than didactically passing on what the adult already knows to the child, the adult, as an interpreter suggested, “Facilitating is allowing room to grow and experiment together, whereas teaching is, ‘I know this. You don't. I'm gonna say this’ ” (Interpreter, 06-30-14, p. 9). In order to perform scaffolding according to this light, interpreters are trained and encouraged to use the following strategies with children and families in Playscape.

**Mirror Talking**

Based on the concept of Powerful Interactions (Dombro, Jablon, & Stetson, 2011) that guided the practice of the Playscape interpreters, mirror talking communicates to the child that the adult is paying attention to what the child is doing. The act of verbalizing helps the child become aware of his own action.

The Reggio educators and TCM really want to provide the materials, provide the welcome for them to create, but then let's just stand back, watch, and see what they can do, but also talking through that process at the same time. "Oh I see. You chose to use that paintbrush. I wonder why you chose that paintbrush. Can you talk to me a little bit
Another benefit of mirror talking is that it validates the child’s effort in doing something and encourages the child to advance it to the next level. Nonetheless, mirror talking is only an initial step of scaffolding. In order to evoke critical thinking, the adult needs to ask the child questions that are related to the activity s/he is doing.

**Asking Open-Ended Questions**

According to staff members, instead of giving a direct instruction, the role of the adult is to facilitate the play environment and ask open-ended questions that prompt the child to think about the process of problem solving or the task itself so that s/he can make deliberate choices to accomplish the task.

[It’s about] living in those questions…The scaffolding [is] noticing what the child is doing but then also asking the child, "What do you think about this?" or "What do you think might happen?" or "What made you do this?" and "I wonder about that..." just asking over and over again those open-ended questions. (Staff 2, pp. 4-5)

These open-ended questions require children to use higher order thinking, which involves, for example, metacognition, logical thinking, and reasoning. The interviews with Playscape interpreters also show that they agreed that asking questions is one of the key scaffolding behaviors, as shown in two of the interpreters’ responses below.

[The most powerful learning that a kid can have] is to have adults with them, not solving problems for them but asking them, "What are you doing here? Do you think it would work better if we did this or this?" Asking them more questions to continue that learning, (Interpreter, 06-23-14, p. 11)

I probably ask questions most often as my method [of scaffolding] or say, "Oh, I wonder what would happen if we did this" and then to sort of allow the child to kind of make that connection. And then sometimes I might just in parallel play be, "Maybe I'll try this," and just sort of make that verbal, "I think I'm gonna try this," and then see if they're able to, "Oh, okay, I'm gonna try that, too." So, maybe a little bit of modeling and then a lot of asking those questions, "I wonder what..." or "I think. What do you think might happen if...?" (Interpreter, 06-27-14, p. 10)
Providing Information

The Playscape interpreters also perceived providing a new concept or information as one of the scaffolding strategies, because it introduces children to abstract concepts that they would not have understood otherwise and expands their use of language.

For me, scaffolding is when…the adult is playing with that child and they do something by either asking questions or giving vocabulary, giving ideas that then allows that child to think a little bit more critically or move up a little bit higher to a higher level of learning that they wouldn’t have been able to achieve on their own. (Staff 3, pp. 4-5)

It's just introducing these new concepts to them that they wouldn't necessarily know. (Interpreter, 06-24-14, p. 12)

An example is when children were having difficulties building a track at the Race ‘n Roll because they did not use the foam blocks to adjust the level of the tracks. The interpreter walked up to them and suggested to the children, “You know, these are really neat too 'cause you can stick them under here and create different levels” (Interpreter, 06-27-14, p. 9). Within a couple of minutes, they were working with the parents to build up a new track. One of the critical elements of scaffolding mentioned in this example is that the interpreter offers an idea that the children would not have figured out on their own without executing the task for them. Another interpreter expressed the same belief that the ultimate goal of scaffolding is to assist children to complete the task independently.

I mean, my really big thing with kids and learning is that you want them to independently be able to learn it and understand it. We can guide them, but they ultimately need to be the one that understands it so that they can repeat that action in the future. So, that's why scaffolding is so important. We help guide them to that point, but we never do it for them. (Interpreter, 06-24-14, p. 18)

This perspective also aligns with Wood et al.’s (1976) assumption that the scaffolding process will eventually enable the child to eventually accomplish the task on his own. In addition to providing useful information for a task, interpreters also acknowledged that an expansive collection of vocabulary is vital for young children and thus sought opportunities to introduce
new words to them, for example, the interpreter introduced the term “whirlpool” to children while they viewed Hiroshige’s *Whirlpool and Waves at Naruto* during the art program (Angela, 07-04-14, p. 12).

In summary, interviews and in-gallery observations showed that the museum staff members regarded mirror talking, asking open-ended questions, and providing information as the key components of scaffolding. They put a strong emphasis on asking questions in “what…if” scenarios to encourage them to manipulate objects and experiment with alternative methods. These staff accounts show that the definition and the use of scaffolding in an open-ended learning environment may be different from the theory and the use of scaffolding in a problem-solving task with a close-ended outcome.

**Facilitating Parental Scaffolding**

Since family learning is one of the core values at the Children’s Museum of Indianapolis, the goal of the Playscape interpretation team is to encourage parental involvement in children’s play in hoping that the parents will enhance children’s learning experiences by scaffolding them during their play.

One of the goals of Playscape is to shift that mindset of the adult from being an observer to being an active participant. We want them to be playing alongside with their child because…they scaffold the child’s learning and bring it to a higher level if the adult is engaged and participating. (Staff 3, p. 4)

The role of the Playscape interpreters is, therefore, to facilitate parental scaffolding by utilizing the following strategies.

**Posing a Challenge**

As mentioned earlier, there was no clearly defined task in Playscape and, as a result, children mostly engaged in free play. Although most of the time parents in the study stayed close to their children, they might not participate in the play but rather monitored their child’s
behaviors. In order to encourage parents to participate in the play, interpreters sometimes pose a challenge that requires the parents to assist the child in accomplishing the task.

We also talk about thinking up a problem or a challenge that you can give to the family to solve so if they were building with blocks, maybe you could tell the child and parent, "I wonder if we could build a bridge using these blocks," or "I wonder if we could build a castle. How would you build a castle?" So, it's kind of like a challenge or something that they have to work on together to do. (Staff 3, p. 1)

When an interpreter uses this strategy, she personally joins the child’s activity and then poses a challenge that is related to what the child is doing, so it is pertinent to the child’s interest. The interpreter also needs to estimate the child’s ability and pose a challenge that is a little bit beyond the child’s capability in order to draw the parent in.

**Inviting Parents to Join**

Despite a strong intention to involve parents into the child’s play and to facilitate parental scaffolding, the presence of an interpreter sometimes generates the opposite reaction from the parents.

There are parents that see us that way and that they think that once the museum staff member's interacting with their child that "Oh, yeah. I can just sit back and watch. I don't need to go and help because they're going to teach my child everything." That's where one of our goals for Playscape is to make sure we're being more purposeful about asking the adult to come and join in the interaction. (Staff 3, p. 8)

Consequently, another strategy that interpreters use to facilitate parental scaffolding is to explicitly invite parents to join the child’s play, because some parents may be reluctant or feel embarrassed to play in the public area as the parents expressed their concerns in Shine and Acosta’s (2000) study. Interpreters in the study frequently used this strategy in the art and the music program.

I think always inviting the adult is the big thing…It's like to get adults to help them…for example, like in a music program, if I'm handing out sticks for kids to bang together and make rhythms, [I'll] say, "Adults, if you have a small child, you can help them hold the rhythm sticks and help them make the beat." That kind of gives them little direction of what to do. (Interpreter, 06-23-14, p. 9)
In another instance in the art program, an interpreter encouraged children to discuss with their parents about natural objects that they chose for printmaking. Announcing it aloud to the whole group, the interpreter assigned a role to parents to engage in a conversation with their children regarding their prior experiences.

Interpreter: Now maybe you can talk to your grown-up about where you might have seen that object before. Can you talk to your grown-up about if you've seen that somewhere before?

_Angela crouches down next to Mira, who has just picked up a piece of star fruit._

Mira: I've seen that at the beach.

Angela: You saw this at the beach? This...what does it look like?

Mira: A starfish.

Angela: Does it? This is a star fruit.

Mira: Star fruit?

Angela: Mm-hmm. (Angela, 07-04-14, p. 14)

In addition to the art and the music program, interpreters also employed this strategy when they participated in children’s free play at different areas in Playscape. Below is an occasion when an interpreter brought out chalkboards and colored chalk for families to draw as an extra activity.

There was a cool moment [when the little girl said,] "Oh, I want to draw a pirate ship but I don't know how." And I was like, "Oh, I bet your grown-up knows how to make a pirate ship." It's a way to get them to do something together. And then I invited them like, "Now you two can pick up any color you want and you both can add something to the pirate ship." So, the little girl started scribbling, but the mom was adding windows and things. (Interpreter, 06-23-14, pp. 7-8)

The interpreter not only assigned a role of a helper to the mother, but also gave them an idea of collaboratively adding features to the pirate ship.

**Bringing Out Additional Materials**

Interpreters also bring out additional materials to arouse both children’s and parents’ curiosity so that they could explore the new objects together. Besides chalk drawing and different types of scarves, at noon an interpreter usually brings out the curiosity cart.

We have things on top [of the curiosity cart]. We have like butterfly specimens or color sorting and that one's really great, because the whole family comes up to you usually and then the parents are very engaged. (Interpreter, 06-24-14, p. 16)
The interpreters have a variety of objects that they bring out each time and they usually are things that children can touch.

**Modeling Scaffolding Behaviors to Parents**

Another important role of interpreters is to model scaffolding behaviors to parents so that the parents will adopt some of the scaffolding behaviors and continue using them with the child after the museum visit. For example, when an interpreter saw uninvolved parents, she would join the child’s play and model to the parent how she enhanced the child’s learning by taking notice of what the child is doing, asking questions, or posing a challenge. Below is an instance in which a non-participant mother stood back while a girl was chalk drawing with the interpreter.

*A girl, Laura, draws a line like a letter "L".*
Mother: Laura, you wanna go and have some lunch?
Laura: Yeah.
Interpreter: So, your "L" was for your name, right?
Laura: Yeah. I’m gonna go eat lunch.
Interpreter: You're gonna eat lunch and you know what. That starts with "L" too.
Mother: Can you say "lunch"? Laura's gonna have lunch.
Interpreter: Laura's gonna have lunch. (Laugh)

*Laura repeats the sentence.*
Mother: All right. Let's go. (Interpreter, 06-27-14, p. 1)

The interpreter noticed that the letter “L” was associated with the girl’s name when her mother called her. When the girl said she was going to have lunch, the interpreter used this opportunity to teach her phonics. Her mother continued the teachable moment by asking the girl to pronounce another “L” word, “lunch”.

**Fading Out for the Family to Work Together**

Once the interpreter succeeds in getting parents to be involved in the child’s play, the next strategy is to fade out from the play and allow the family to continue working on the task together. Below is a play scenario at the Blockopolis, in which the interpreter asked the child to think about different elements of a house.
Interpreter: What else do you have to have? Is this a two-story house or a one-story house?

_The girl shows one finger._

Interpreter: One. Oh, so we don't need stairs then.

Mother: How would you make stairs if you wanted stairs?

Interpreter: Oh, what a good question. How would we make stairs if you wanted stairs? I don't know.

_The girl stacks a few blocks together._

Interpreter: What a good idea. Maybe your grown-up can help you stack those blocks up to make some stairs. Well, I'm gonna challenge you. See if you can make a really big tree house to go with your little house. All right you might have to let your grown-up help. Well, have fun.

Mother: Thank you. (Interpreter, 06-30-14, p. 6)

When the interpreter noticed that the mother began to join the play, she gave them a challenge to work on and left them to have parent-child time.

**Introducing Activities to Do At Home**

In addition to parental scaffolding that takes place in Playscape, the interpretation team also aims for parents to continue scaffolding their child at home, as an interpreter explained, “Ultimately you really want to get them to be able to do this outside of the museum” (Interpreter, 06-24-14, p. 13). In doing so, interpreters often try to relate museum activities to those that they can do at home, for example, the interpreters who led the art program told parents that they could use natural materials or found objects at home for printmaking. Also, at the end of another art program, interpreters gave out an instruction sheet, which shows how to bake the clay bee in the oven to make it hard.

These six strategies were utilized throughout exhibit areas in Playscape, although interpreters made a remark that some areas were more challenging for them to engage in Powerful Interactions with families and to facilitate scaffolding than others. In spite of a strong belief and support in parental scaffolding among all Playscape staff members, there was one person who also made an explicit acknowledgement of other parenting styles and different reasons that parents brought their child to the Playscape.
There are different styles of parenting and some parents who jump right in there and they're comfortable acting silly like a kid and playing. [In contrast,] there's a parent who sits over there and they just want to watch their child. That can be for different reasons. Sometimes parents bring their children here so their children can learn to be independent and become independently social with children their own age. And that's why they do it. Sometimes it's just that's the type of parent they are. They're not real hands-on. Of course, we try to encourage the real get-in-there-be-involved so that they will scaffold for the child. (Staff 1, p. 11)

The staff member’s recognition of the varying reasons for the museum visits shows another level of respect and understanding of different ways that parents behave in Playscape. Her statement indicates that parents who appear to be uninvolved possibly aim to foster different skill sets for their child in each museum visit, for example, to be independent or to develop social skills. Consequently, it is also important to take parents’ objectives of the museum visits into account as the museum staff members try to encourage parental scaffolding. I briefly mentioned a few parents’ objectives in chapter 4 and in the observations of parent-child dyads, but the full account that parents explained the purposes of bringing their child to the museum and their perceptions of their role in Playscape is presented in the next section.

Parents’ Stated Purposes of a Museum Visit

In order to determine whether the exhibit environment and the interpretive endeavors facilitate or hinder parental scaffolding, it is vital to identify the purposes that parents had in mind for the museum visit and to understand which types of skills they intended to foster during the visit. Each parent mentioned more than one purpose in the post-visit interview and the purposes usually reflected their concern of the child’s development in various domains. Nonetheless, seven out of the ten parents who stated the purposes of their visit shared one common goal, which was for the child to play and have fun, as two mothers explained,

The purpose of the museum visit is for [the children] to have fun [and] to learn to explore their world a little bit. (Angela, 07-04-14, p. 33)

I don't wanna push learning on her if she's not having fun. (Orlena, 10-17-14, p. 29)
These mothers expressed their beliefs that children learn through play and these hands-on experiences in Playscape would broaden the child’s horizons of the world. Parents also stated some learning goals for the museum visit. Four parents hoped that the child learned social skills, specifically learning to share and interact with other children, while two mothers focused on teaching basic knowledge such as letters, shapes, and colors to prepare the child for kindergarten. In addition, one mother also aimed to foster independence in her son. Although parents did not state cognitive development and critical thinking as the goals of their visit, they implicitly mentioned them when they explained their interactions with their respective child at the Reaction Contraption.

I like how she can learn how to play all the different stuff. And then like the balls and stuff ... just kind of seeing when you stick those balls in that tunnel, it's gonna go up in the shoot. Kind of like a cause-and-effect like you put this in here, it's gonna cause it to do all this stuff. (Katie, 06-07-14, p. 26)

In other words, the parents wanted their child to get an idea of how things work and why they do so. Furthermore, on the last repeated visits of the three families that took place in October 2014, I gave a list of objectives of a normal Playscape visit and asked parents to rank them from 1 to 5, 1 = most important and 5 = least important purpose of their visit. (The list can be found in Appendix K.) The result confirmed the interview data, as parents ranked “for the child to have fun/to play” in the top two purposes of their visit. On the other hand, the ranking of knowledge acquisition vary from being the second most important to the second least important purpose of their visit. As an example, a mother Katie further explained that learning was not the primary reasons for her visits now with her daughters being 2 and 4 years old, but she recognized that this might change when they get older.

Once they get like in like third or fourth grade...then maybe there’s something here that [they] can relate [to their science class]. Or maybe you’re talking history about like those terra cotta warriors. [Y]ou come here and see that and learn about
them. So, as they got older, it would change to the learning aspect, but with them being young, it’s just us getting out having fun. (Katie, 10-26-14, p. 21)

Her statement may indicate that the child’s age influences the purpose of the museum visit. The other reason that did not appear in the interview, but was ranked in the top three was for the family to spend parent-child time together.

**Parents’ Perceptions of Their Roles in Playscape**

Parents’ stated purposes of their museum visit seem to be directly correlated with their perceptions of their roles in Playscape. The interview responses with eleven parents revealed five roles they associated themselves with: an observer, a social mediator, a facilitator, a co-player, and an experience organizer. The parents who wanted their child to learn to interact with other children mostly perceived their role as an observer and sometimes as a mediator if the child misbehaved or had a conflict with other children. In contrast, those who stated learning in terms of general knowledge and exploring how things work tended to see their role as a facilitator who enhances learning opportunities and provides guidance for the child.

Instead of just having fun, I wanted her to be learning while she's having fun. That's the best way to learn, the best time to learn, I think. (Orlena, 10-17-14, p. 28)

They need some assistance, but for the most part, they learn by doing things themselves. [I’m there to provide] guidance to how to do things. (Ben, 06-28-14, p. 17)

It is important to note that half of the parents identified themselves with more than one role in one visit and the roles were not mutually exclusive. Figure 21 illustrates the percentage of the parents\(^9\) who identified themselves with each role in Playscape.

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\(^9\) Only 11 out of twelve parents responded to the question regarding their perceptions of their roles in Playscape.
Figure 21. The bar chart shows the percentage of the parents in each role in Playscape.

Additionally, parents’ perceptions of their role[s] are also related to other factors, such as the character and the mood of the child and their idea of the best way for the child to learn, as Sarah explained,

[I]t would depend on day-to-day how the child is interacting with anything…if they're doing well, they're behaving and having fun, then I'll kind of lay back. But if she's kind of being shy, then I'll step in and...play with her a little bit more. (Sarah, 07-07-14, p. 22)

Half of the parents perceived one of their roles to be an observer, since they believed that children learned best by being hands-on and doing self-discovery. However, a few parents added that some guidance from an adult was also helpful. As a result, they tended to stand back but would jump in if they saw a sign of frustration.

I think [parents] should just step back and watch their kids…I kinda want her to learn for herself and not learn because this is what I've told her. I want her to explore and if she needs more clarification or help, I'm there to help her. (Katie, 06-07-14, pp. 26-27)

On the other hand, only one mother in the study, Mikaela, thought that the best way for her son to learn was to imitate. She explained that at home she often showed Marcus and her daughter how to do things and they would imitate her actions. This could also be due to her own experience, as she did not see herself as a hands-on person, who learns best by engaging in self-
discovery. As a result, she perceived her role in the museum as a facilitator who needed to demonstrate for her son.

Lastly, two parents in the study explicitly explained that one of their roles was to ensure that the child got to explore everything in Playscape, since children tended to be fixated on one or two things that appealed to them for a long time. One mother, Brooke, expounded,

Luis likes to spend his time on one area and doesn't really know time constraint. So…I tried to lead him to something else to make sure he gets to do everything. [Otherwise,] he'll be like, "I didn't get to do that." (Brooke, 06-28-14, p. 13)

I referred to this role as an experience organizer, because these parents limited the amount of time their child spent in each area and initiated a play exit so that the child can have a well-rounded experience, from free play with water and sand, to gaining basic concepts such as cause-and-effect at the Reaction Contraption. Although only two mothers saw themselves as the experience organizer, my observational data showed that the majority of the parents, except Melah, often suggested to their child to move on and explore other areas in Playscape. This could also be due to the fact the parents wanted to maximize each visit since they do not go to the museum as frequently as Melah, who brought her son, Marvin, to the museum every Sunday.

**Emerging Themes**

Examining all the observation and interview data, I found three notable emerging themes that might have influenced parental scaffolding in Playscape. These themes are not directly in accordance with the two research questions, but they possibly provide a fuller account of the regular visits to the Playscape.

**Repeated Visits**

Maria-Ethan and Orlena-Tehila made three repeated visits to the Playscape throughout the course of five months, while Katie-Ally visited the Playscape twice for the study. The initial
goal for repeated visits was for me to see how parental scaffolding and family interactions may evolve over time due to familiarity with the exhibit environment as well as with me, the researcher. The three families had been to the renovated Playscape at least once before the first visit for the study, so they were somewhat familiar with the space. However, it was the first time for them and the other nine families to be observed and followed in Playscape. A couple of children in the study were very shy with me at the beginning. Tehila, for example, did not talk to me on the first visit, but we read a story together on her second visit. On the third visit, Orlena explained that Tehila appeared to be more at ease because she was more familiar with the exhibit areas and me.

[Tehila] probably feels more comfortable with you. Her sister was here this time and because she’s been here a couple of times now. She’s used to everything. (Orlena, 10-17-14, p. 28)

Besides children, parents were also fully aware of my presence and the fact that they were being observed in the exhibition. The level of parental scaffolding may vary across the visits, but each parent tended to focus on certain scaffolding behaviors, for example, Orlena posed tasks and challenges to Tehila at different exhibit areas across the three visits. Katie strongly promoted imaginative play and often asked Ally questions to explain her activities, while Maria focused on introducing new vocabularies and new concepts to Ethan. Among the three parents, Maria’s level of interactions across the three visits seemed to fluctuate the most. She was very engaged in Ethan’s play in the first visit, but mostly stood back and became uninvolved in the second visit. Her level of engagement increased in the last visit, although not as much as the first visit.

**Parental Scaffolding With More Than One Child**

Despite the fact that parents in the study did not deliberately mention the issue of usually having multiple children on a museum visit, Figure 4 in chapter 3 shows that 11 out of twelve
families in the study have more than one child. The post-visit interviews with these parents and the fact that a few of them brought more than one child to the Playscape visit show that when they visit the museum, they usually bring more than one child with them. Angela, for example, brought three children to the Playscape on the scheduled visit and Orlena also brought her 14-month-old along with Tehila on the third visit to the Playscape. A non-participant mother Julie made an important statement regarding the different dynamic of parent-child interactions when she brought more than one child to the museum. She voiced her opinion on how this scheduled visit would be different from her normal visits with three kids.

It will definitely be a lot different when I can actually do what I want to do with her today and when I carry a baby around and [try] to keep track of [the 2-year-old]…I’m excited to be able to focus on her, but it’ll be different. (Julie, 07-09-14, p. 1)

In the post-visit interview, she further elaborated that her interaction with her 4-year-old girl on this visit was more than usual. She also allowed Lizzie to run around more freely rather than tell her to stay close by so that she could keep an eye on the other two children (Julie, 07-09-14, p. 5). Similarly, even though Angela tried to focus on 4-year-old Mira because of the requirement of the study, she constantly kept track of the youngest one. Likewise, Orlena’s scaffolding interactions with Tehila became shorter and less frequent in contrast to the previous two visits when she came to the museum without the baby. She explained that it was hard for her to keep up with Tehila, who moved quickly from one station to the next while she was holding the baby (Orlena, 10-17-14, p. 29).

Scaffolding from Siblings

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10 Due to the low rate of participation in the study, I also recruited and observed one family who was enrolled in the preschool program at TCM. However, I decided not to include the family in the main findings, because I was unable to confirm their income level.
These Playscape visits, in which the parent brought more than one child, gave me opportunities to observe interactions between siblings, particularly how a child learned from an older sibling. There were a few occasions when Mira attentively observed her 6-year-old brother, Jack, and then imitated his action. For example, during the printmaking activity in the Art Studio, Jack picked up a plastic orange slice. He dipped the side of the orange slice in paint and then rolled it on the paper. Mira watched him. Less than a minute later, she picked up a lemon slice and did the same thing Jack did (Angela, 07-04-14, pp. 15-16). This young child appeared to see an older sibling as one of her role models.

On the other hand, Mira also played a role of a big sister to her younger brother. When Connor got stuck in the climber and cried for help, she offered to get Connor and, in fact, would have climbed up to help him if her mother had not stopped her.

Connor: Help me get down, Mama.
Angela: How do you get down? Go this way. Go up this way.
Jack and Mira walk to an entrance of the climber.
Mira: Connor, could you stay right where you are? I have to help Conn.
Mira is climbing in. Jack has already climbed up.
Connor: Mama, I need help. (Angela, 07-04-14, p. 24)

In addition to being protective toward younger siblings, parents also expected the older child to transfer knowledge and help guiding the young ones. For instance, Orelana suggested Tehila to bring her baby sister to the Babyscape and show her “how to work everything” before they left the Playscape (Orlena, 10-17-14, p. 19).

I want [Tehila] to kind of teach [Bree] what she already knows, like I wanted to take her to the baby area to see if Tehila would show her how to work (inaudible) the baby stuff. And she was trying to get her to learn the light switch thing, but she [Bree] didn’t care. But yeah, just to get her to pass on what she knows to her sister. That was my goal. (Orlena, 10-17-14, p. 30)

Thus, when there was more than one child, the visit could not revolve only around the child in
the target age group. Parents had to accommodate the interests of all their children. For example, Orlena let Tehila choose what she wanted to play first and then asked her to spend some time in the Babyscape for her sister’s benefit hoping that Tehila would scaffold her sister as well. Having said that, Tehila scaffolded her sister a few times in other areas in Playscape, for example, she facilitated her sister’s exploratory play at the Sandbox by making a heap of sand on the edge near her sister, who could barely walk by herself, and holding her hand to feel the sand.

These three factors were not in the initial plan of the study; however, they influence family interactions and parental scaffolding in Playscape and thus provide a more realistic picture of the Playscape visits. As mentioned in Chapter 3, 9 out of 12 families are considered frequent visitors based on Hood’s (2004) definition and most families had been to the updated Playscape at least once prior to the study. Scaffolding behaviors of parents who belong to this category may be different from those who were the first-time visitors to the Playscape. In addition, parents often brought more than one child to the Playscape and therefore they were unable to give full attention to a single child. Given parents’ expectation for the child to play with and learn from his or her siblings, parents may not get involved in the child’s play as much as those who visit with only one child.

Chapter Summary

In summary, this chapter illustrates different types of scaffolding behaviors that low-income parents used with their preschoolers at the nine exhibit areas in Playscape in response to the primary research question, “How might low-income parents scaffold their preschool-aged children in an early childhood exhibition in a children’s museum?” Findings from interviews with the parents provide insights into their scaffolding behaviors, which might be influenced by the purposes of their visits and parents’ perceptions of their role in the museum. The second part
of the chapter responds to the supporting research question, “How is parental scaffolding facilitated or constrained by the exhibit environment and the interpretive programs in Playscape?” The parents pointed out features of the exhibit environment that facilitated or discouraged them from scaffolding their child in Playscape. In addition, interviews with the museum staff offer another perspective of scaffolding and reveal strategies that the Playscape interpreters used to facilitate parental scaffolding. These findings, including emerging themes, provide a basis for discussion in the next chapter.
CHAPTER 7
DISCUSSION, CONCLUSION, AND IMPLICATIONS

This chapter begins with a discussion of the characteristics of the family participants and then moves onto an in-depth discussion of parental scaffolding in low-income families based on the observational and interview data in relation to some of the theories and studies presented in the literature review. The findings show that low-income parents in the study scaffolded their preschoolers at the exhibit elements that presented a predefined task with purposive goal attainment. In addition, they used a wide range of learning and skill-enhancing behaviors with their child in Playscape. Then I further discuss notable learning and skill-enhancing behaviors in more depth. The types of parents’ supports varied based on the activities and tasks available at the exhibit areas, the parents’ stated purposes of the museum visit, and their perception of their roles in Playscape. The last section of the chapter examines how the exhibit environment and the interpretive programs affect parental scaffolding in conjunction with the literature pertaining to parental involvement and scaffolding in a museum setting. The chapter concludes with the limitations of the study and recommendations for future research.

**Typicality of the Twelve Families**

Since the findings of this research derived from my observations and interactions with a small number of participants, I want to begin my discussion with the particularity of this group of family participants who were recruited from the Access Pass program. Due to the low response rate, I did not turn down any family who met the initial criteria and showed an interest in participating in the study. Therefore, this group of participants was self-selected. The majority of the parents in the study are female (ten mothers and one grandmother) and mainly White American. Based on the longitudinal study of 2002, which shows that the low levels of
educational attainment are associated with lower levels of income (NCES, 2015), I assumed the parents in the Access Pass to have lower levels of educational attainment. In contrast, the self-reported findings show that only 3 out of the twelve parents earned a high school diploma, which was the lowest level of educational attainment in the study, while two mothers are pursuing a bachelor’s degree at the time of the data collection. This finding aligns with IHEP’s (2010) report that the proportion of low-income young adults enrolled in college has been growing between 2000 and 2008. This trend could be a result of their beliefs that “a college degree provides a critical step out of poverty” (p. 9) and that an increasing number of jobs require some type of postsecondary qualification.

Furthermore, I also presumed that the low economic status entailed that these families had limited access to educational resources and toys. However, many parents indicated that their children also had access to electronic devices such as a smartphone, a tablet, or even an Xbox, although they did not specify whether their children had their own devices or borrowed from their parent. Noticing that all of the parents in the study own a smartphone as they often used it to take photos of their children in Playscape, it appeared to me, as an individual who comes from a developing country like Thailand that has a great disparity between the rich and the poor, that this group of low-income families did not seem much different from the middle-class. These children had plenty of toys, such as a pretend kitchen set and a water table, at home. Some of the parents also told me that they read bedtime stories with their child, when they had time and they also brought their child to other educational and leisure attractions like libraries, zoos, and other types of museums, and even made a yearly visit to a theme park.

However, the more I got to know the families, some subtle characteristics surfaced. For example, the families acquired comparable resources through discounted channels such as using
secondhand children’s shoes or renting an apartment from their parents at a lower rate. It also appeared that one-third of the low-income parents in the study could not afford quality child care facilities unless both parents worked full-time. Consequently, they become stay-at-home moms. If these children did not have siblings, they had even fewer opportunities to play with children their age, because the parents were somehow uncomfortable with them playing with other children in their neighborhood. Reliance on networks of family and friends, a lack of affordable childcare, and child safety were also among the primary concerns and reasons that the welfare-dependent mothers decided to remain on welfare (Edin & Lein, 1997). In addition, half of the children in this study either had some health problem or difficulty with speech development. Most of the children in the study recognized letters and their names, but were unable to read in sentences. They seemed to develop early literacy skills at a relatively slower rate compared to the middle-class child that I observed in the pilot study, who was able to read the wall text in a sentence.

I was able to obtain all of this information because of the parents’ openness and friendliness. When I met the families for the first time by the ticketing office, I tried to avoid mentioning the Access Pass program, because I was afraid that it was a sensitive issue. However, the parents usually made a deliberate remark that they had the Access Pass card and used it to get a discounted admission even when I was the person who paid for it. All of the parents in the study, except two of them, openly and extensively talked about their child and their lives in general until the children showed that they were ready to do something else. The parents seemed to trust me to a certain extent, for example, one of them left their stroller and bags with me while she went down the slide with her child and another parent left her daughter with me when she needed to go to the bathroom. This could be due to my museum staff badge as well as multiple
encounters with the few families who made repeated visits. Furthermore, at the end of the visit, all of the parents also expressed a willingness to participate in the study again.

Regarding the visitation pattern, the families in this study spent an average of 53 minutes in Playscape, which was much longer than the average stay time—37 minutes—of the general public observed between May and August 2014 (TCM, 2014). Similar to the TCM’s findings, the families typically made the first stop at either the Natural World (one-third at the Creek and one-fourth at the Sandbox) or the Invented World (2 out of the twelve families at the Reaction Contraptions), because they were the first areas upon entrance to the Playscape. The top five most frequented areas in Playscape were the Sandbox, the Creek, the Climber, the Reaction Contraption, and the Blockopolis, respectively, while the Art Studio was the least visited area found in both this study and TCM’s (2014). Although the goal of the study is not to compare the low-income behaviors with those of the general public, the preliminary comparative analysis shows a similar visitation pattern between this group of participants and the general visitors of the Playscape.

In short, this group may not accurately represent the low-income population. This self-selected group of low-income parents has relatively high levels of educational attainment and, therefore, may feel more comfortable to participate in a university-based study at the museum. Furthermore, a couple of families might be living in poverty only temporarily, while they were full-time students with no sufficient income. Nonetheless, it appeared that the parents in the study were enthusiastic in exposing their child to different experiences and learning environments like zoos, libraries, and museums by utilizing their friend and family networks in order to take advantage of the available resources such as discounted clothing, lower rent, and
the Access Pass program. The next section examines the notion of scaffolding and its implementation in Playscape.

**Parental Scaffolding in Playscape**

The notion of scaffolding is often associated with promoting higher order thinking, particularly problem solving skills (Belland, 2014; Wood et al., 1976). Scaffolding has been applied to different settings from laboratories to home environments to informal learning spaces like museums. At the Children’s Museum of Indianapolis, the concept of scaffolding not only guides the design of the Playscape, but is also used as an indicator of successful parental involvement in children’s play.

The major challenge I encountered during data analysis is the context and the definition of scaffolding in the original paper: (1) Wood, Bruner, and Ross (1976) used the term “scaffolding” in the context of problem-solving with purposive goal attainment; (2) Their study was conducted in a laboratory setting, where there were only blocks available for the child; (3) There was a clearly defined and close-ended task for the child to solve; (4) The adult was an expert on the task or at least knew how to accomplish the task; and (5) A big part of the scaffolding process in the original study was that the tutor assisted the child to recognize means to an end. However, these criteria can hardly be fulfilled in an open-ended environment like the Playscape, because (1) problem solving is not the only skill that parents of preschoolers aim to foster during the museum visit; (2) There are a variety of exhibit elements for the child to interact with in Playscape; (3) There is no clearly defined task in Playscape. The child and/or the parent initiates a task, which is often open-ended; (4) The open-ended nature of the task makes it implausible for the parent to identify the end product; and (5) Some tasks were also novel for the parent, so s/he might not have a clear understanding of how to work on the tasks.
In addition to the contextual differences between Wood et al.’s (1976) study and the Playscape, the equivocal definition of scaffolding makes it difficult for researchers and practitioners to identify scaffolding behaviors in a setting that diverges from the original study. Wood et al. defined scaffolding as a process in which the adult limits the elements of the task to those that are within the child’s competence; however, the tutoring procedure that they described also involves conventional teaching methods such as demonstration, verbal instruction, and direct assistance. Given the description of this procedure, scaffolding appears to be a specific type of teaching strategy that takes into account the child’s learning capacities and individualizes the assistance for the child with a goal of independent completion of the task and mastery of new skills and knowledge. The completion of the task marks the success of the tutor’s scaffolding endeavors.

Contrary to the original definition in Wood et al. (1976), the observations and interviews with the Playscape interpreters show that the Playscape staff used the term “scaffolding” more loosely. For them, scaffolding can take place in any kind of situation, including one without a predefined task. Scaffolding behaviors include both verbal and non-verbal supports that enable the child to utilize his existing skills or knowledge in order that the child can acquire a new set of skills or knowledge based on Vygotsky’s (1978) Zone of Proximal Development. In addition, the influence of the Reggio school on the Playscape interpretive approach also puts more emphasis on asking children questions to get them to deliberate on the process of problem solving and critical thinking. Doing so also aligns with the mission of the Playscape, which recognizes the importance of cognitive, emotional, language, and social development in young children.

Based on the original definition and the context of scaffolding in Wood et al. (1976), predefined tasks with purposive goal attainment can be found at the Pond (the climber), the Whirly
Twirly, and parts of the Reaction Contraption. The findings show that the parents in the study engaged in a scaffolding process to help the child accomplish a task. For example, when the child worked on a pre-defined task like making a scarf twirl around the tower and climbing to the top of the boats, most parents got involved by asking a hinting question or giving a clue to the child so that the child could accomplish the task by himself or herself. However, there were a few occasions in which the child became frustrated and parents needed to provide further support by giving step-by-step instructions to get the child to complete the task, for example, directing the child to climb up on specific routes in the Climber.

**Learning and Skill-Enhancing Behaviors in Playscape**

Interview data show that the parents’ agenda for a museum visit involved an intention to foster different types of school readiness skills beyond problem solving, particularly language development, social skills, and acquisition of basic knowledge such as shapes, colors, numbers, and the alphabet. In doing so, they utilized a variety of learning and skill-enhancing behaviors such as posing a task, verbalizing/repeating, connecting to prior experiences, engaging in pretend play, and encouraging prosocial behaviors. Before making further analyses of these behaviors, I want to elaborate on the notable behaviors that parents in the study used with their children in the Playscape.

**Framing/engaging in pretend play.** Play is by no means a task due to the lack of goal attainment. However, it provides a joyful circumstance that intrinsically motivates children to learn (Csikszentmihalyi & Hermanson, 1995) and perform self-regulation in order to play by the rules (Vygotsky, 1978). Wood et al. (1976) described the dampening effect when the tutor asked children to leave their imaginative play to work on the predefined task. Since there is no close-ended task in Playscape, framing an activity into pretend play can be considered as a step to
recruit the child’s interest into an activity in Wood et al.’s description of the scaffolding process. Instead of weaning the child off the play, the parents used play as an entry into a meaningful learning experience and also as a tool to enhance symbolic and creative thinking. For example, Melicia suggested that a long piece of wood block at the Blockopolis was a driveway for their houses.

In a longitudinal study of American middle-class mothers’ participation in everyday pretend play, Haight and Miller (1992) suggested that educated, middle-class mothers extensively engaged in pretend play with their children. Pretend play with mothers at ages 24 and 36 months lasted longer than children’s solo pretending. At 48 months, although mothers and children continued pretending together, mother-child pretend play was less sustained than pretend play with other children. Interestingly, framing or engaging in pretend play was one of the most prevalent scaffolding behaviors that the low-income parents in the study used in Playscape. Parents’ participation in pretend play was observed at seven out of nine exhibit areas. The longest pretend play took place at the Sandbox, where Melah and 3-year-old Marvin did pretend baking for over 30 minutes, whereas mother-child pretend play with the 4- or 5-year-olds only lasted a few minutes.

**Posing a task.** Besides a few predefined tasks at the Climber, the Whirly Twirly, and part of the Reaction Contraption, most activities in the Playscape are open-ended with no specific goals. At other exhibit areas, where tasks are not defined and children were mostly engaged in free play, posing a task is a critical skill that reverts a play session to the original task-oriented context of scaffolding. In addition, posing a task is strongly aligned with the goal of the Playscape, which aims for “adult-guided intentional play as opposed to overly familiar role play where children frequently play alone” (TCM, 2011, p. 3). The exhibit development team tried to
assist parents in initiating guided play by giving ideas of activities and questions on the signage and information sheet at different locations. One of the benefits of the guided play and task posing was that the child was able to engage in activities that aimed to enhance certain types of skills; for example, the suggested task on the information sheet in the Music Studio aimed to promote preparatory audiation. If the parents did not use the museum resources to set up a task, they were more likely to pose tasks that they were more familiar and comfortable with; for example, twice Orlena posed tasks related to alphabet recognition as she later explained that she liked reading and writing.

**Encouraging prosocial behaviors.** Encouraging prosocial behaviors, connecting to prior experiences, and verbalizing are major additions to the original list of the scaffolding behaviors, because they are outside the context of problem solving. However, parents employed these strategies to build up other critical skills for school readiness, for example, social skills and language development. One-third of the parents in the study perceived Playscape as a safe space for their child to learn to play and interact with other children. They considered sharing as an essential skill for their preschoolers, since a few of them had little experience playing with children their age or those who are not their siblings. I observed parents encouraging prosocial behaviors in four areas of the Playscape: the Creek, the Reaction Contraption, and the Music Studio, and the Pond. These areas have a similar characteristic of having a limited number of the popular items or exhibit elements that many children liked, for example, the fishing net at the Creek, the sucking holes at the Reaction Contraption, and the metallophone in the Music Studio. The Pond also had tight spaces for children to climb simultaneously. The parents often asked their child to wait for their turn and also to take turns with others who were waiting in line as well.
**Connecting to prior experiences.** Prior experiences and knowledge provide a basis for the child to construct new knowledge and make sense of the world. Piaget (1952) explained that when a child encountered a new experience, there were two ways to reach a stable understanding of the new experience. He would first try to assimilate that experience into the existing schemata. If it did not fit into the existing schemata, he would then adapt what he knew and create a new schema accordingly. This idea of using prior knowledge as a stepping-stone to acquire new knowledge and skills corresponds to Wood et al.’s (1976) description of scaffolding. One parent, Maria also expressed a similar viewpoint that the more common knowledge Ethan learned when he was young, the better-rounded he would be as an adult (Maria, 05-27-14, p. 24). Again, unlike scaffolding behaviors in Wood et al., which were intended to have a direct impact on the child’s performance on a given task, parental scaffolding in real life may aim for a long-term effect on the child’s knowledge and experiences.

**Verbalizing/repeating.** Maria and Mikaela, both of whom expressed some concern with their child’s speech development made many attempts throughout the exhibit space to repeat words or sentences after the child in order to either confirm what the child said or model the correct pronunciation to the child. Even with the parents’ attempts, Ethan and Marcus did not always successfully make the right pronunciation after their mothers. Moreover, the mothers sometimes did not put in extra effort to correct them again. For example, Maria asked Ethan to repeat the word “xylophone” after her and he uttered, “Ai-fone” (Maria, 05-27-14, p. 21). It was, therefore, arguable whether such attempts were considered scaffolding. However, I regarded such an attempt as a scaffolding behavior, because the best way for children to learn language is multiple exposures over a period of time. This single account observed in Playscape visit may be part of a series of attempts that took place inside and outside of the museum.
Nonverbal hinting and being physically present. Lastly, nonverbal hinting and being physically present were rarely, if at all, observed in Playscape. Parents tended to be verbally specific when they gave a hint to young children. Consequently, they hardly used hinting gestures with the child. Being physically present was considered a scaffolding behavior only at the Pond. Because unlike other open areas in Playscape, particularly where mobile seating was available for parents to sit next to the child, the Pond has a closed climbing structure and children usually climbed up by themselves. Therefore, the parents of young and inexperienced children often stood next to the climber and assisted their child when she or he was frustrated or struggled to find the right path. Nevertheless, the parents in the study nearly always stayed next to their child at all areas in Playscape with a few exception, such as when the Creek, the Reaction Contraption, and the Whirly Twirly were overcrowded with children, as a few parents felt like they were invading a designated space for children.

Even more so than scaffolding behaviors, low-income parents in the study employed a variety of learning and skill-enhancing behaviors to assist their preschool-aged children in different scenarios from goal-oriented tasks to pretend play. Despite the fact that a value judgment of parental involvement is outside the scope of the study, some learning and skill-enhancing attempts were undeniably more constructive and supported learning better than others. For example, when parents asked children to track the balls at the Reaction Contraption and to manipulate different parts of the machine to help them understand the concept of cause-and-effect, or when Orlena related the act of sliding the mallet on the bars of the xylophone to Tehila’s prior experience of creating a glissando on the piano’s bars. The parents in these two examples introduced concepts that are applicable to novel situations. In contrast, the less constructive attempts were occasions when parents tried to engage in some kind of learning but
did not pursue the rationale further and when parents tried to assist children in a task but ended up doing and completing the task for the children. For example, Sarah used the information sheet to ask Alice about the emotional impact of the tongue drum. After Alice guessed, “Exciting,” Sarah just ended the learning opportunity with “Okay” (on page 149). Similarly, Ben suggested to Hannah that her house needed specific components such as four walls and a door. But when Hannah insisted that what she had built was one of the walls and the additional part was the chimney, the conversation ended with Ben’s “Okay” (on page 123). Both Sarah and Ben entered the conversation with a strong intention to teach, but failed to engage in the play with the child. The teaching attempts seemed to intrude upon the child’s creative play and no meaningful connection was made between what the child was doing and the child’s interest or prior knowledge.

The types and degree of parental involvement varied according to the parents’ goals of the museum visit, the processes of implementation, and the parents’ perceptions of their roles, all of which may be influenced by the social and cultural context of families (Kermani & Janes, 1999). I briefly touched on some of the goals that parents had in association with scaffolding behaviors like verbalizing and encouraging prosocial behaviors. The next section discusses these factors in more depth in relation to the design rationale of each exhibit area.

**Parents’ Agenda VS Design Rationales**

Learning experiences in museums and other educational leisure settings, according to Packer and Ballantyne (2002) are influenced by motivational factors. These “include both the personal characteristics that visitors bring with them to the visit, such as personal goals and capability beliefs, and the situational characteristics that they find in the setting itself, such as opportunities for learning” (p. 185) and the exhibit environment. This section examines the
similarities and distinctions between the parents’ rationales of the scaffolding behaviors and the design rationales of the exhibit environment.

**Parents’ agenda of the museum visit**

In terms of the personal characteristics based on Falk’s (2009) theory of identity-related visit motivations, parents often take on the role of the Facilitators, who make a museum visit for the best interests of their child. Despite the common perception of museums as educational institutions, the post-visit interviews with the parents in Playscape study show that parents shared and prioritized one goal, which was for each child to have fun. This result corresponds with the 2012 survey findings conducted with 8,400 core visitors to children’s museums in the U.S., which show that 79% of respondents placed the reason for their child to have fun and play as the primary purpose of a children’s museum visit (Reach Advisors, 2012).

Although most of the parents did not explicitly state learning as one of their goals of the Playscape visit, when I asked them to clarify some of their scaffolding behaviors at different exhibit areas, they often stated learning as part of their intention. For example, when Maria introduced new tools at the Sandbox to Ethan, she wanted to expand his knowledge of the world around him; when Sam asked David to track the balls, she wanted him to recognize the concept of cause-and-effect. Their actions can be summarized in Orlena’s own words, “I wanted [my child] to be learning while she's having fun” (Orlena, 10-17-14, p. 28). This finding seems to align with Packer’s (2006) concept of “learning for fun,” which emphasizes the process and the experience of learning regardless of the learning outcomes. Furthermore, the questionnaire result in Packer’s study shows that most adult visitors were drawn into learning experiences in spite of the fact that they had no deliberate intention to learn. In this case, although learning was not the
parents’ top priority, they inevitably engaged their child in learning experiences when they saw opportunities for their child to learn.

As mentioned earlier, the focus of scaffolding on problem solving skills seems to be too restrictive to explain parental scaffolding behaviors in Playscape. Dockser (1989) identified thirteen maternal roles in a children’s museum based on the mothers’ stated rationales of their behaviors. The functions of these roles were to support and maximize the child’s cognitive development, social and emotional development, and language skills during the 2-hour visit to the museum. Findings from my observations and interviews show that the parents in the study aimed to help their child foster different types of skillsets including but not limited to exploration, motor skills and creativity depending on the unique interests and needs of the child. For example, for the child who had a passion in art, the priority was getting her to develop her creativity and explore other forms of art. For the child who had little experience playing with children his age, the parent focused on giving him an opportunity to interact more with other children and to develop social skills. For the child who had difficulty in formulating his sentences, the parents tended to ask more questions to enforce verbal expression. Next, I elaborate on the parents’ rationales for scaffolding each type of skill.

**Exploration and exploratory play.** One of the distinctions between exploration and exploratory play is that exploration occurs when a child encounters a new object and tries to investigate its properties with a close-ended goal of figuring out how the tool works. For example, the close-ended goals are to shoot the water out of the baster and to produce the sound on a clatterpillar. Exploratory play follows, once the child becomes familiar with it, he then tries to figure out alternative ways to use it. Play allows more room for experimenting and open-ended outcomes (Hutt, 1966; Lillard, 2015). Parents in the study put a greater emphasis on exploration.
All of them suggested that their child explore as many areas in Playscape as possible in one visit. Eight out of the twelve families visited at least seven exhibit areas on the first Playscape visit for this study. A few mothers explained that one of the objectives of going to the museum was to get the child exposed to different options and experience new things so that they would know what the child loved to do and what resources they should get to help the child pursue his or her interests (e.g., Maria, 05-27-14, p. 24; Katie, 06-07-14, p. 27; Julie, 07-09-14, p. 6). On the other hand, it did not mean that the parent who spent nearly 49 minutes in Playscape and visited only four areas, did not value exploration. It was highly likely that the child, Marvin, as a weekly visitor, had explored everything in Playscape already. Consequently, Melah allowed him to get deeply involved with whatever he chose to play.

**Cognitive Skills and General Knowledge.** Although parents did not explicitly state cognitive development and critical thinking as skills they aimed to foster, their scaffolding behaviors revealed otherwise. The parents of 3- and 4-year-olds in the study often practiced and tested their child’s abilities to recognize colors, shapes, and numbers at different areas in Playscape, particularly the Art Studio, the Blockopolis, and the Music Studio. They reasoned that these skills were essential to prepare children for kindergarten. Since children loved feeding balls into the sucking holes continuously at the Reaction Contraption, most of the parents used this opportunity to introduce the basic concept of cause and effect by encouraging their child to track the balls as well as trying out different routes in the machine. However, they were unable to verbalize why it was important for the child to learn that concept.

The exhibit developers also regarded cause and effect as “the most fundamental learning that a child must master” (TCM, 2011, p. 3). They explained that people encounter cause-and-effect scenarios all the time in everyday life and when children understand this basic concept,
they would begin to experiment with various “what-if” and “if-then” circumstances. The area that focuses on fostering this concept is the Invented World, particularly at the Reaction Contraption. Both the designer and a couple of interpreters mentioned that they used to provide different types of fabric for families to experiment with at the Whirly Twirly and the wind tunnel in the Babyscape and different types of race cars at the Race ‘n Roll; however, I observed only one type of material at the time of data collection. Nonetheless, different textures and sizes of the tracks were provided at the Race ‘n Roll for families to experiment with speed and friction. In addition to cause and effect, a couple of the parents also asked their child to make a prediction, hypothesize, and test their hypothesis regarding the properties of objects and water at the Creek. The exhibit development team also addressed properties of objects in water as concepts for families to explore at the Creek (TCM, 2011). The exhibit development team also provided clear glass cups in various sizes so that children can investigate physical properties of water; however, I did not observe any child in the study doing so.

In addition to scientific concepts, a few parents asserted that they wanted their child to get an overview of how things work. Given young ages of the children, the parents did not expect their child to grasp the concept or memorize new information right away. Rather, they hoped that the fun and exciting experiences that the child had at the museum would become part of his lifelong learning experiences and that he would be able to recall and make sense of it later in life. One mother Katie referred to her childhood experience of visiting a mummy exhibit at the Children’s Museum of Indianapolis in the 90s. She stated that her memory of a pharaoh and Egypt was still vivid in her mind and she hoped the same for her daughters (Katie, 06-07-14, p. 26).
**Language and literacy skills.** Language development is beyond the scope of the problem-solving task in Wood et al. (1976); however, the parents paid as much attention to fostering language and literacy skills as on cognitive skills. Language skills encompass letter recognition, listening, writing, and speaking skills, all of which are critical for not only preparing young children for early literacy in school, but also enabling them to communicate their needs and emotions to others. The exhibit developers perceived language acquisition as “the most critical skill that infants and toddlers will master” (TCM, 2011, p. 8), especially if they receive parental assistance in terms of expanding their vocabularies. Consequently, the museum staff tried to encourage parent-child verbal interactions. The most common scenarios that I observed where children became more communicative were when the child was engaged in free play. For example, when Ethan created a monster out of Playdoh®, his parent asked him to explain what he was doing. This method encouraged the child to convey a story verbally. The mothers of children who had speech problems, Maria, Mikaela, and Katie, tended to put in extra effort to enhance these skills. They mainly asked questions and repeated the words that the child mispronounced to scaffold language skills.

**Social skills.** Social skills include the ability to control emotions, self-regulation, sharing, and turn taking. Since there are a limited number of objects and restricted space in some areas in Playscape, it was highly likely for young children to become frustrated and impatient when they did not get to play with a particular toy or when they were waiting for their turn. The parents, therefore, closely monitored their child’s behaviors when the areas were crowded and urged their child to share and take turns with other children. Their behaviors aligned with the stated perception of their roles in Playscape as a social mediator when conflicts occurred. In addition, the other factor that influences the parents’ promotion of social skills is the child’s experience of
playing with children their age. Four parents in the study, whose children neither went to preschool nor had any opportunities to play with other children in the home environment, stated social skills as one of their goals for visiting the museum. Interestingly, the parents of children who have siblings did not consider social skills as one of their objectives.

**Emotional development.** Emotional development is not the goal of scaffolding, but a part of the scaffolding process in the problem-solving context. Wood et al. (1976) stated that one function of the tutor was frustration control. The tutor needed to help the child overcome his frustration in order to continue working on the task until completion. Although the parents in the study did not state emotional development as one of the skills they focused on during their visit to the Playscape, a few of them used comforting words and stayed close to the child to ease the child’s anxiety or anger when they saw a sign of frustration. For example, Mikaela stood next to the climber and told Marcus that she was right there. She suggested to him to climb down if he felt that it was too high for him to climb up further. The children in the study rarely expressed anger or frustration while they were working on the task, because task completion was not required in Playscape. However, they tended to get frustrated when they waited for their turn to use the exhibit and angry when another child took away something they were using. Therefore, emotional development in this sense is strongly related to social skills. The parents usually explained to them that the other child did not mean to take away his object and diverted his attention to something else. In addition, the parents also tried to model a better way to resolve a conflict rather than express anger; for example, one mother, Maria, asked an older boy for a ball and gave it to Ethan. She explained to Ethan that the boy shared a ball with him and he should also learn to share as well.
**Gross and fine motor skills.** The exhibit developers identified the Lily Pond or the climber as the only place in Playscape where children could practice gross motor skills. However, the parents in the study did not explicitly discuss this skillset. Only one parent in the study, Angela, who is a preschool teacher, mentioned that activities like stamping and objects like turkey basters and sticker papers were great for fine motor skills, because they exercised the small muscles of the hand used for early writing. A few parents also stated that they encouraged their child to engage in hands-on activities, which involve being physically active and playing outside, rather than be virtually active on electronic devices. Although they did not provide a reason for their preference, the opportunities to practice gross and fine motor skills could be one of the reasons.

**Creativity.** Creativity is another problematic term that has been interpreted in various ways, yet has some common characteristics such as originality and divergent thinking. However, a few parents in the study associated it with imaginative thinking, symbolic play, and pretend play, all of which were promoted in the Art Studio. The developers strongly emphasized opportunities for children to explore and exercise their creative expression in different media, for example, drawing, painting, printmaking, and sculpting, regardless of the end product. The museum displayed a wide range of artworks, such as the fantasy animal sculptures, a series of abstract paintings of rabbits, and the Chihuly glass art, and used them as sources of inspiration for discussions and art making. A couple of mothers in the study like Katie and Melah strongly valued imaginative thinking. They promoted and engaged in pretend play with their child both at home and at different areas in Playscape. These parents believed that children learned best by being hands-on. The parents also stated that they saw themselves as an observer, who let the child explore independently first and would jump in if the child needed help. Their role as an
observer is crucial for the child to develop creativity, as Kemple and Nissenberg (2000) suggested that the creative family environment needed to make children feel safe to explore, experiment, and express their ideas. Furthermore, Michel and Dudek (1991) found that mothers of highly creative children were less involved with and less likely to be overprotective of their children than other mothers.

Parents’ perceptions of their roles and children’s learning

Besides the parents’ personal agendas to foster critical skills, the parents’ perceptions of their role in Playscape and what they considered to be the best way for their child to learn also determined how they chose to interact with the child. Gaskins (2008) found that mothers from different cultural groups visited a children’s museum with different conceptions of play and different expectations of their role in the child’s play. Unsurprisingly, European-American mothers “most closely match the museum’s expectations of how visitors will use the exhibit” (p. 15). They believed that children learned through play and they were willing to be the child’s play partner. Although more than half of African American mothers associated learning with play, they expected children to play mostly alone or among themselves.

The findings in Playscape study, on the other hand, show that only one European-American mother explicitly stated that her child learned through play. Most other parents in the study, both European-Americans and African-Americans, implied that play and learning occurred simultaneously. Despite high parental involvement being observed in the study, more than half of the parents in both cultural groups in the Playscape study perceived their roles as either an observer and/or a facilitator. The only parent in the study who identified herself as a co-player was an African-American mother, who would follow the play choices of her son. This
dissonance may occur due to the small sample sizes\textsuperscript{11} and different characteristics of the sample in Gaskins (2008) and my study. Gaskins seemed to focus on the middle-class families with children ages 2 - 12, while the sample in Playscape study was drawn from the Access Pass members, who had children ages 3 – 5. Parents’ emphasis on play expressed in my study might be a result of a relatively younger age range of the children.

Furthermore, the majority of the parents perceived their roles as an observer and/or a facilitator, because they felt that children learned best by doing hands-on activities. Half of the parents who advocated for hands-on learning also added that little or some guidance from adults would assist children’s learning. Only one European-American mother stated that the best way for her child to learn was to imitate adults. Consequently, she perceived her role to be a facilitator, who modeled different ways of using the tools to her child, and a social mediator when he had a conflict with other children. Lastly, most of the parents in the study explained that they visited the Playscape, because of a variety of activities that they could not do at home. Thus, they took on the role of an experience organizer, who encouraged their child to explore as many options as possible within a limited amount of time.

In addition to the personal characteristics and the rationale of the parents, the situational characteristics also influence parents’ scaffolding behaviors and thus children’s learning experiences in museums. Melber (2007) found that mothers, who visited two exhibition halls in a large natural history museum with their preschool-aged child, varied their verbal teaching behaviors based on the physical environment. The majority of the mothers explained the differences between the two exhibitions in terms of the intended experience. Since the discovery center was specifically designed for children, it was more hands-on and thus the mothers allowed

\textsuperscript{11} Gaskins’ (2008) interviews involved 16 European-American, 10 African-American, and 19 Hispanic-American parents, who have children between the ages of 2 and 12.
children to explore more freely. The mothers tended to use more perceptual statements, which include naming and giving information. The physical setting of the Playscape is similar to that of the discovery center. However, the design rationales of the space was based on the idea that “young children learn though play and activity and their optimal development involves the family” (TCM, 2011, p. 1). The exhibit development team highly promoted parental involvement. Consequently, the exhibit elements were designed to attract the parents’ attention and offer them examples of questions and activities they could do with the children. In the next section, I discuss how the exhibit environment and the interpretive approach influence parental scaffolding in more depth.

**The Exhibit Environment and the Interpretive Approach**

The document of the conceptual design of the Playscape indicates a number of learning theories and early childhood curricular frameworks, for example, Vygotsky, Sutton-Smith, Bruner, Reggio Emilia, and Montessori, all of which had implications for exhibit and program development (TCM, 2011). However, the two major influences that kept being mentioned during the interviews with the staff were the notion of “scaffolding” and the Reggio Emilia approach. Despite similarities between these two approaches, there are a few significant distinctions that play a major role in the staff’s perceptions of scaffolding, the exhibit design, and the interpretive programs in Playscape. Consequently, I want to clarify these similarities and differences before discussing the effects of the exhibit features and the interpretive approach on parental scaffolding.

**Influences of Vygotsky and the Reggio Emilia Approach in Playscape**

The notion of scaffolding is grounded in Vygotsky’s (1978) Zone of Proximal Development (ZPD). In the original context of scaffolding in Wood et al. (1976), an adult serves
as an expert who knows the answer to a problem, while a child is a novice who can reach his potential capability with the adult’s assistance. Thus, learning takes place during the tutorial process, in which the child acquires knowledge and skills beyond the actual level of development. Since Vygotsky was one of the major influences on Malaguzzi’s thinking (Edwards, 2002; Gandini, 2008), the Reggio approach shared the same view with Vygotsky that learning occurred in a social context. However, the Reggio approach focuses on social relationships that a child has with the family, the teachers, other children, the society, and the environment (Edwards, 2002). Children are regarded as competent, curious, and expressive. As a result, the role of the teacher is not to guide children to the correct outcome, but rather provide an environment that promotes exploration and communications among children (Cadwell, 2003).

In addition, Malaguzzi (1994) encouraged teachers to be receptive to unpredictable events that emerge from children’s discovery and ask them open-ended questions in order to facilitate their investigation. Teachers should also attentively observe and document children’s behaviors in order to better understand their interests and development (Cadwell, 2003). Given these roles of the adult, the teacher becomes partner and facilitator of children’s learning experiences. The new interpretive approach in Playscape used a combination of the Vygotskian and the Reggio approaches, in which the interpreters and the parents should assist children in advancing knowledge and skills during the process of problem-solving, language acquisition, and other tasks. Nonetheless, the parents were not required to be experts on any given task. Both the parent and the child could work together to solve a problem or make sense of a situation. In addition, the Playscape interpreters were trained to use the Powerful Interactions to model different ways that parents can participate and scaffold their child during a play event. For example, interpreters often asked children open-ended questions to get them to think carefully
about their actions as well as to encourage them to verbally communicate their intentions with others.

It is important to note that the environment is considered to be a “third teacher” in the Reggio approach (Cadwell, 2003, p. 4), since it should offer a wide range of materials to evoke children’s curiosity. The senior museum staff who were involved in the exhibit design described the influence of the Reggio approach on the exhibit environment, particularly the Natural World that was designed in muted natural tones and the Art Studio, which had a variety of natural materials that were put in clear jars and organized in a row from warm to cool colors. Families also could see children’s artworks and the reproductions of masterpieces side by side on the wall. Moreover, families were encouraged to use different types of musical instruments to perform improvisational music in the Music Studio. This gives children an opportunity to explore the use of different media to express their feelings and identity (TCM, 2011). Nevertheless, since family learning was the core value of the Playscape, the exhibit developers designed exhibit elements that would appeal to adults and thus invite them to join children’s play. In addition, the signs were placed at different areas in Playscape to offer parents examples of scaffolding behaviors. In the next sections I elaborate on the effects of the exhibit environment and the interpretive programs on parental scaffolding.

**The Effects of the Exhibit Environment on Parental Scaffolding**

Beaumont (2006) asserted that three factors of exhibit design: labels, seating, and the presence of floor staff, influenced parental scaffolding. My findings also confirmed her assertion; however, I would like to put these factors into two main categories: labels and seating are part of the exhibit environment and the presence of floor staff is considered in terms of the interpretive approach that these staff members were using with the families. Similar to Beaumont’s (2006)
findings that labels that posed simple questions and tasks helped parents to initiate a conversation with their children, the parents in the study who read the labels or cutouts, found them to be useful in providing them concise information that they could share with their child. This was particularly noticeable in the Music Studio, where many instruments were also novel to the parents, and the Sandbox and the Art Studio, where there was no clearly defined task. In addition to text labels, the Playscape designer also reflected that picture cutouts could better capture parents’ attentions and convey the message to the parents of young children within seconds. Although the parents in the study did not make any comment regarding the cutouts, I observed some parents looking in the direction of the cutouts behind the tubano drums and the amadinda and then engaging in a similar activity as the pictures suggested.

Another factor of the exhibit design that affects parental scaffolding was seating. Beaumont (2006) found that seating had both a positive and a negative impact on mother-child interactions. Mothers tended to observe and allow children to stay longer at the exhibit, where there were benches available for the parents to sit and relax. In a contextual exhibit, where seating was part of the restaurant, for example, parents who sat at the table implicitly became customers and were directly involved in children’s pretend play. In Playscape, however, the designer had purposely provided mobile seating instead of benches at the Sandbox, the Art Studio, the Music Studio, and the Blockopolis for parents to use so that they got a benefit of resting as well as participating in the child’s activity. One mother in the study also noticed this change and stated that the mobile seating allowed the parents to be on a child’s level without hurting their back (Sarah, 07-07-14, p. 23). All of the parents in the study who visited those areas used the stools to sit next to the child and participate in the child’s play, except when there was not enough seating to accommodate all the children in the area. Gaskins (2008) found that the
availability of mobile seating increased parent-child talks for only caregivers of preschool-aged children and not for families with older children, because the caregivers felt that younger children required more assistance whereas the older ones could play on their own.

In addition to labels and seating, the contextual design of the exhibit also facilitates parental scaffolding, particularly in terms of framing an activity into a pretend play or a role-play. Although the Playscape did not feature typical everyday settings like a supermarket, a doctor office, or a post office as presented in other studies of contextual exhibits (Gelman, Massey, & McManus, 1991; Ringel, 2005), many exhibit elements in Playscape also had a similar effect of providing a familiar concrete platform for parents to comfortably discuss a particular topic, initiate the child into a pretend play, and even take on a role in the play together with the child (Gelman, Massey, & McManus, 1991; Ringel, 2005; Shine & Acosta, 1999).

These familiar elements include the natural-looking Creek with a rain cloud, the animal costumes at the lily Pond, sieve pans at the Sandbox, and the skyscraper wall mural depicting the downtown Indianapolis at the Blockopolis,

Despite all these supporting features, the parents also described that the child-sized openings at the climber and the Whirly Twirly Tower and the level of crowdedness may result in less parental involvement compared to an open structure such as the Creek and the Blockopolis even when there were fewer children in those areas. A few mothers in the study (e.g., Angela, 07-04-14, p. 30, Julie, 07-09-14, p. 8; Katie, 10-26-14, p. 18) explained that they felt like they were invading the children’s space and interrupting their play when the area was busy, so they decided to stand back and, if needed, guide their child from the outside. In addition, a mother, Katie, also stated that she was less likely to offer any exhibit-related explanation to the child if it appeared to be self-explanatory and the child knew how to play, for example, in the sand (Katie,
Katie’s comment reflects Gaskins’s (2008) idea of parent’s matchmaking, which explains that parents will get involved in their child’s activity and scaffold the child only if they feel that the exhibit element is “beyond the ability of the child” (p. 11) and that they could contribute to the child’s experience. In addition, the Playscape summative evaluation shows that caregivers viewed that the Playscape features support family learning as well as “children’s solo interaction with gallery elements” (TCM, 2014, p. 32). This finding aligns with what the parents in my study referred to as family-friendly and kids-only areas.

Furthermore, an interview with an interpreter showed that parents might also hesitate to participate in the child’s activity in the Music Studio, because they were self-conscious dancing and being silly in front of other parents. This explanation corresponds with Shine and Acosta’s (2000) findings that parents were reluctant to play in a public area. In order to help parents overcome embarrassment, it was a common gesture for the lead interpreters in the art and music program to invite parents to participate in the activities with their child and the interpreters usually received positive responses from the parents.

**The Effects of Interpretive Programs on Parental Scaffolding**

Besides inviting parents to join the child’s play, the staff could also serve as models for parents to engage the child in conversations and activities. Beaumont (2006) indicated that the presence of the floor staff facilitated parent-child interactions. The mothers in her focus group expressed that the museum staff “inspire[d] and engage[d] children in play and exploration in ways that mothers might not” (p. 100). The majority of the families in my study, however, did not interact with the interpreters outside the art and the music programs. As a result, they did not make any elaborate comment on their interactions with the interpreters. However, interviews with the interpreters showed that the presence of interpreters might have both positive and
negative effects on parental involvement. An interpreter explained that the parents might stand back and watch their child interacting with the interpreter, because they viewed interpreters as experts and felt that their child was in good hands. Consequently, interpreters tended to make explicit invitations to parents to join their activities.

My observations of the interpreters performing Powerful Interactions and interviews with these interpreters revealed that the interpreters believed that their job was to enhance parental involvement in the child’s play. The interpreters also believed that they should scaffold parents by demonstrating different ways to extend the child’s play in hoping that the parents would adopt their strategies and continue using them with their child in other exhibits in the museum and even outside the museum. I observed a few occasions in which parents watched the interpreter engaging in a Powerful Interaction with their child and adopted her questioning strategies; for example, a mother extended the interpreter’s question regarding the child’s house by asking her child to consider how to make stairs for a two-story house.

In addition to interacting with interpreters, parents also conversed with and observed one another. One mother in the study, Katie, indicated that one of her scaffolding strategies was borrowed from another parent. She explained that she saw one father demonstrating how to use a scraper to create lines in the sand and therefore decided to show it to Ally as well. Another example was when a different parent’s action reminded Melicia to put a smock on for Mica at the Creek. Nonetheless, peer observation was only a small influence on parental scaffolding in Playscape, as most parents focused on their child and therefore did not deliberately observe other parents.
**Limitations of the Study**

The first limitation of the study is that the sample of the low-income families was self-selected, restricted to families who use English as their first language, and recruited from the Access Pass Program with an exception of families who live in the museum neighborhood. The shortcoming of self-selection is that the study may exclude many marginal families, who may not share the same perspectives as those who chose to be in the study. I initially wanted to recruit the participants on site during the Target Free Thursday Nights. However, based on my personal experience at TCM, the free nights were overwhelmingly crowded. Families usually rushed through the crowd and did not want to stop to participate in a survey. I predicted that parents might use less scaffolding behaviors on the free nights due to the high crowd level. Therefore, I decided to recruit families in advance and scheduled a museum visit when the museum was not as crowded as on the free nights.

Due to the lack of funding and the fact that I was the sole researcher in the study, I recruited families whose primary language was English so that I could transcribe their conversations. Although I specified this requirement in the invitation for participation to the Access Pass members, a few Hispanic parents responded to the invitations and expressed an interest in participating in the study. However, I did not recruit them into the study because English was not their primary language. Furthermore, the museum specifically asked me not to recruit families in the museum neighborhood, because they had already participated in other programs and the museum staff did not want to wear them out. As a result, the results of my study may not be generalizable to the low-income populations in Indianapolis and other cities in the United States. Nonetheless, 11 out of the twelve parents in the study were female, which reflected the higher percentage of female caregivers (89%) in children’s museums (Reach
Moreover, the majority of the participants were frequent visitors of the Children’s Museum of Indianapolis and active visitors of other informal leisure institutions such as libraries, zoos, and other museums that participate in the Access Pass program, so their accounts may provide valuable insights that are useful for museum professionals.

Second, the study is conducted in one exhibition in a children’s museum that is regarded as the biggest and best children’s museum in the world. The museum has received both federal funding and private donations to develop its exhibitions and educational programs, the resources of which may not be available for smaller museums. Thus, the renovated Playscape may be considered to be one of the best-case scenarios. Although case studies and other qualitative research are often criticized for their lack of generalizability, Lincoln and Guba (1985) argued that qualitative studies have a certain degree of transferability, which can be enhanced through a thorough description of the context and assumptions guiding the study. In addition, a case study can provide an in-depth understanding of a phenomenon that is superior to representativeness (Stake, 1994).

Third, despite my intention of being unobtrusive during the observations (by following them from behind and using the voice recorders that enabled me to listen to their conversations while standing 5 – 6 feet away from the families), the families were fully aware of my presence. Two children looked for me when they were moving to other areas in Playscape, while a few children were being conscious of the voice recording and asked to take it off during the first five minutes in Playscape. The parents were also worried that it would get wet at the Creek and took extra caution to keep it inside the smock. Because of my presence, the parents might have tried to exhibit more interactions with their child. Leinhardt and Knutson (2004) cautioned researchers in a possibility of “artificial talk”. Family visitors may put more effort in making conversations
amongst themselves when they are aware of being subjects of the study. They may also refrain from personal family talk that they would have said normally, because their voices are being recorded. Therefore, these observational records may illustrate the best parental scaffolding behaviors. Nonetheless, the repeated visits of the three families showed that although the dynamic of parent-child interactions and their interests may vary across the visits, these parents used rather consistent scaffolding strategies with their child. Furthermore, the use of the voice recordings allowed me to make sense of their interactions in real time and generate questions more effectively for the post-visit interview, which took place right after the observation.

Lastly, the one-on-one parent-child interactions may illustrate best scaffolding opportunities. One of the mothers in the study, Julie, raised an important issue of studying a parent-child dyad that the study may capture unrealistic accounts of parental scaffolding in Playscape since the majority of the parents visited the museum with more than one child. In addition, my observations show that most preschoolers have a younger sibling to whom the parent had to pay more attention. However, I tried to take this factor into consideration and included the first and repeated visits that the parent unintentionally brought more than one child with her. The findings of those visits did show that the parents exhibited a different dynamic when more than one child was present.

Despite the limitations of the study, this is one of the few studies that focus on a low-income audience and how they scaffolded their preschool children in a children’s museum. The study not only broadens research in family learning in museum settings, but also benefits many museums that aim to be the revitalizing agent for their neighborhood. Museum practitioners will also gain an understanding that help them better understand the needs of low-income parents. I
hope that researchers and museum professionals will use this study as a starting point and
develop a concrete research design that builds on the limitations of this study.

**Conclusion**

The goal of the study is to understand parental scaffolding in low-income families in a
children’s museum through the case study method. The Playscape at the Children’s Museum of
Indianapolis served as both the intrinsic and instrumental case for me to explore the notion of
parental scaffolding from both the museum staff’s and the low-income parents’ points of view in
relation to the existing literature in the field of early childhood education and museum education.
In spite of the particularity of the case and the small sample in the study, the thick descriptions of
the exhibition, the twelve parent-child dyads, the in-gallery observations and the interviews with
the staff and the families aim to provide a vicarious experience of being in the Playscape to the
readers so that the readers can make connections and apply the findings of this study to their own
institutions.

One of the key findings in this research is that the low-income parents used a wide range
of scaffolding behaviors with their preschoolers. Some of the scaffolding behaviors that they
used, however, did not fit into the context of problem solving with purposive goal attainment due
to the open-ended nature of the exhibit environment and the parents’ agenda to enhance other
readiness skills beyond problem solving. Nonetheless, when the parents got involved in a task,
they assumed a role of a facilitator and a co-learner, who worked on a task with the child and
asked the child questions to get him to think about his action rather than demanding him to
produce a particular outcome. These roles of the parent aligned with the staff’s expectations of
the adult’s role in children’s learning, which was influenced by both Vygotsky and the Reggio
Emilia approach, in contrast with the adult’s role as an expert who knows the right outcome in
Wood et al.’s (1976) study and Vygotsky’s (1978) ZPD. In addition, I found that a more important scaffolding behavior in the Playscape, where there was no predefined task, is not the parent’s attempts to assist the child in solving a task, but the parent’s abilities to identify a problem and pose a playful, yet developmentally appropriate task to the child. This kind of task prolonged the child’s engagement in the activity and extended the child’s learning.

The other key finding in this study shows that the Playscape staff and the low-income parents in the study seemed to have divergent priorities for families’ in-gallery experience. The interviews with the designer and the director of early childhood education show that the exhibit environment was designed not only to accommodate children at different developmental levels, but also to encourage parental involvement. In addition, the interpreters explained that the ultimate goals of the Powerful Interactions are to shift the parent’s mindset from being an observer to being an active participant in the child’s play and to model scaffolding behaviors to the parents so that they could adopt the scaffolding strategies and continue scaffolding their child after they left the museum. All of the interpreters interviewed in the study expressed the same view that children learned best when the parent was engaged in the play with the child, because the parent could extend the child’s learning in many ways. For example, parents were asking questions that build on the child’s knowledge, adding elements that enhance a sense of discovery into the activity, and being a co-learner with the child. In contrast, the majority of the parents in the study perceived their roles to be an observer, a facilitator, and an experience organizer. They thought that the best way for their child to learn was to engage in hands-on activities with little-to-some guidance from the parent. Although the parents had different priorities on their agenda, most of them viewed Playscape as a safe environment for their child to go play, explore new things and learn critical skills for school readiness such as language development, general
knowledge acquisition, and social skills. All of these readiness skills were mentioned in the Playscape planning document (TCM, 2011), but somehow subsided in the execution process. For example, the document suggests that socialization is a skill that children will practice or learn in all four worlds (the Sensory World, the Aesthetic World, the Invented World, and the Natural World) in the Playscape. Socialization should include opportunities to interact with children their age as well as with adults; however, in practice, the Playscape interpreters put a greater emphasis on parent-child interactions.

**Implications for the Field of Museum Education**

Many children’s museums have shifted their focus from child-centered to family learning, as the museum professionals acknowledge that parental involvement plays an important role in children’s experiences in a museum. The interpretation department at the Children’s Museum of Indianapolis, for example, employed the Powerful Interactions, which is an approach based on Vygotskian’s sociocultural perspective, in order to enhance children’s learning experience. The interpreters used the term “scaffolding” to describe their behaviors and target behaviors they hope to see parents use with their child. However, unlike the original context of scaffolding in Vygotsky’s (1978) ZPD and Wood et al.’s (1976) study, the interviews with the museum staff revealed that their interpretation of scaffolding is a combination between the Reggio and the Vygotskian schools, in which the parent and the child work on the task together and the parent is not necessarily an expert on the task. This interpretation is, in fact, more compatible with the exhibit environment of the Playscape, which encourages open-ended learning with no predefined tasks. However, the unsettled definition of scaffolding requires me to further examine the concept of scaffolding and identify other types of behaviors that encompass other skill-oriented assistance outside the problem-solving context. The findings
show that it is important for the researcher and museum practitioners to have a clear and shared understanding of the concept that guides the practice in the museum. Otherwise, there are risks of different ways of implementation and evaluation.

In addition, since the mission of the children’s museum is to create and enhance family learning experiences, it is critical for the museum professionals to understand the family’s agenda, parents’ perceptions of their role in the museum, and the rationales for their behaviors before arriving at a conclusion that parental involvement is imperative for the child to have a meaningful museum experience. As Barton et al. (2004) suggested, parental involvement in school was often determined by the parent’s interactions with the teacher and the parent’s participation in school events. Likewise, parental involvement in the museum was often identified with the parent’s proximity to the child, meaning that the parent was not sitting back but engaged in an activity next to the child. Beaumont (2006) argued that the mothers in her study, who were not actively playing with the child, were in fact making a thoughtful observation of their child and very “involved inwardly” (p. 81). The parents in my study also noticed what appeals to the child and how the child interacts with others and could be considered “involved” according to Beaumont. However, a more important question is not the label of “involved” or “uninvolved” but what the parents hoped their child would get out of the museum visit. Four parents in the study mentioned that one of the purposes of their museum visits was for their child to interact with other children and to learn how to cope with social conflicts, because those opportunities were not available at home or in their neighborhood. In order to promote peer interactions, the parents tended to stand back and observe how their child played with others. There is a risk, however, that a researcher or a staff member would make an early judgment that these parents are uninvolved, while they were consciously trying to foster social skills. On the
other hand, if museum professionals understand that some parents bring their children to the museum with social and affective goals, they could design a range of environments that support different goals, for example, some areas may encourage more interactions among young children and parents can play a role of mediator in that area, while other areas still focus on parent-child interactions and cognitive development.

Implications for the Field of General Education and Art Education

Recently I read an article written by Tim Walker, a former American teacher based in Finland. Walker (2015) raised an alarming fact that American education is pressing children as young as kindergarteners for academic achievement, particularly in literacy and math, at the expense of play (Bassok, Latham & Rorem, 2015), whereas the Finnish National Board of Education requires its kindergarten teachers to provide an environment that encourages playful learning opportunities (Finnish National Board of Education, 2010; Walker, 2015). Walker questioned the Common Core State Standards that were adopted in more than 40 states, including Illinois and Indiana, and portrayed a contrasting image of the playful learning experience that he observed in a Finnish classroom. His advocacy of play-based learning makes me reflect on my research in Playscape, where play is also at the heart of learning.

This type of play environment that Walker (2015) observed in a Finnish classroom, which supports both free play and guided play can also be found at numerous places in the United States, most of which take place in informal learning institutions like museums, science centers, aquariums, and even entertainment complexes. Although the learning environment and the level of expectation in learning and teaching in Playscape differ from those in a formal educational setting, I believe that this case study provides many implications for general education and art education. First, learning is driven by intrinsic motivation, which is, for young children, related to curiosity and play. Most parents in this study and previous research (Reach
Advisors, 2012) placed an opportunity for their child to play and have fun at the top priority for a children’s museum visit. They considered the preschool period as the time for children to explore different options and broaden their perspectives of the world. However, once children go to preschool or a day-care center, adults expect them to do nothing, but studying. It is, therefore, vital for teachers, educators, and administrators to create an environment and provide educational resources that evoke the child’s curiosity and expand the child’s knowledge based on individual interests of the child.

Second, real-life problems require divergent thinking and other types of skill such as interpersonal skills and emotional control in addition to cognitive development and literacy. The public educational system has placed a great emphasis on cognitive development, literacy, and problem-solving skills, because they are early probable indicators of future success. However, school instruction and assessment often instill the notion of one right answer in the youth. This convergent thinking is barely applicable in real life. The open-ended nature of the activities in Playscape encourages families to explore different options and use their imagination to create new structures. Furthermore, the parents in the study also identified other critical skills that they hoped to foster in their preschoolers, such as social skills and emotional development.

Third, learning occurs on a continuum. It neither begins in school nor stops when children leave a classroom. Museum professionals in the children’s museums and other types of museum advocate for parental involvement, because the parents know their child best. They could make a meaningful connection between the museum experience and the child’s life and build on the child’s prior knowledge. Furthermore, the Playscape interpretation team also tried to model different scaffolding strategies to the parents and offered ideas for projects that can be done at home, because they wanted the parents to continue scaffolding their child even after they
left the museum. In art education, art teachers incorporate visual and popular cultures to make classroom learning more relevant to students’ lives. Yet, there is little discussion on how preschool and elementary teachers could involve parents in their child’s learning about those visual culture even though they are likely to be exposed to the same media with their child.

**Personal Implications**

I have learned many things from this research, and the three most important lessons are the issues of assumptions, research findings, and trusting relationships. I must accept that I entered the fieldwork with some assumptions about the low-income families. These assumptions were influenced by media exposure, particularly Hollywood, the news, and even the existing literature, most of which often associate low socio-economic status with low levels of educational attainment and high crime rate. Poor parents were stereotyped as neither engaged in school nor attentive to children’s well-being (Gorski, 2013). However, the more I got to know the families during the museum visits, the more they showed me that those assumptions were misperceptions. The study shows me that it is vital for the researcher and the museum professionals to be aware of their assumptions and aim to pursue an understanding of the subject from an unbiased perspective.

I have also learned that scaffolding and parental involvement are much more complicated than I originally thought. The findings in this study provide some new ideas, yet still a partial understanding of parental scaffolding that the low-income parents used with their children in the museum. In future research I hope to gain more insights into their daily lives, available resources, and any effort they put into planning and making museum visits and other informal learning opportunities possible for their children. In order to do that, I could include more questions regarding those circumstances in post-visit interview sessions only with the parents.
However, I believe that repeated visits over an extended period of time and meetings outside the museum are essential to build more trust with the families.

Last, but not least, none of this would have happened without trusting relationships with the staff members at the Children’s Museum of Indianapolis and the family participants. I have come to realize that research work, at least in social science, is not doable by one person. Going into the field with little experience, the museum staff helped me from the first step of making an appealing invitation letter to recruit family participants from the Access Pass program to becoming participants in my study and sharing their insights about the exhibit design and the delivery of the interpretive programs in the Playscape. Most of the parents in the study were also very open with me during the interviews and allowed me to be part of their family visits to the museum. I felt that the trust that the parents gave me, for example, talking casually with me, letting their child hold my hand or play with me, or even leaving the child with me briefly, helped the children feel more comfortable with me following them in the Playscape, all of which enabled me to successfully collect the data.

**Recommendations for Future Research**

In Playscape study, I attempted to understand how low-income parents scaffolded their preschool-aged children in an exhibition that was specifically designed to support this age group and encourage family learning. I documented a wide range of scaffolding behaviors, which aimed to support different sets of skills and found that parental scaffolding behaviors were influenced by a number of factors, for example, the parents’ visit agenda, the perceptions of their roles in Playscape, and the exhibit environment. These factors provide a glimpse into the complex notion of parental scaffolding in low-income families. Barton et al. (2004) argued that parental engagement in high-poverty urban schools was not only about what the parents do, but *how* and *why* these parents from language and ethnic minority backgrounds maneuver in
“unequal distributions of power” (p. 4) and gain access into the school-based space to advocate for their child. Likewise, parental scaffolding did not take place only in the museum. The parents’ efforts to scaffold their child’s learning in museums began with their intention to bring their child to the museum. How did the parents know about the Access Pass program? How far do they have to travel from their house to the museum? What arrangement did they have to go through to bring their child(ren) to the museum? Did they visit the museum with their friends and the friends’ children to create a play-date for their child? What kind of conversations did they have with their child before and after the museum visit? The answers to these questions may provide a more complete picture of “the Ecologies of Parental Engagement” (Barton et al., 2004, p. 3) in a museum setting.

In addition, I found during the data analysis that there were occasions when the parents made efforts to scaffold the child but did not pursue until the end. Such behaviors could be considered bad scaffolding compared to those that resulted in a full completion of a task or an acquisition of new knowledge. However, discussion of “good” versus “bad” scaffolding is beyond the scope of this study and could be further explored in a future study, in which the attributes of good and bad scaffolding behaviors are predetermined. Furthermore, parents’ comments regarding their usual visits with more than one child leads to more interesting questions of “How does the dynamic of the parent-child interaction change when a parent visits the museum with multiple children?” And “how can museums assist parental scaffolding or scaffolding between siblings in this case?”

Lastly, the demographic transformation of the U.S. population is going to have a direct impact on the new faces of museum visitors. The current minority groups such as African Americans, Latinos, and Asian Americans will become the new majority of museum visitors in
the near future (Farrell & Medvedeva, 2010). Yet, little is known about other ethnicities or cultural groups. Gaskins (2008) had already begun investigating three dominant cultural groups, which were middle-class European-American, African-American, and Hispanic-American. There needs to be more extensive studies on this new majority in order to better understand how children’s museums can better accommodate these parents, who may exhibit varying degrees of involvement due to their different expectations of museum experiences and different perceptions of their role in the museum.
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APPENDIX A

INFORMED CONSENT LETTER FOR MUSEUM STAFF

Wasana Sriprachya-anunt (Researcher)  
PhD Candidate in Art Education  
University of Illinois, Urbana-Champaign  
412-551-2011  
sriprac2@illinois.edu

Laura Hetrick, PhD (Research Supervisor)  
Assistant Professor in Art Education  
University of Illinois, Urbana-Champaign  
217-333-0855  
laurajh@illinois.edu

I am a doctoral candidate in art education at the University of Illinois, Urbana-Champaign. I am conducting a study focusing on adult-child interactions in a museum exhibition that is designed for early childhood learning.

The goal of the study is to understand how exhibit features and interpreters’ assistance affect adults’ involvement in children’s activities in Playscape exhibition. Results from this study will help museum staff identify ways to improve the design of the exhibit and museum services so that they meet the needs of adult caregivers. The results will also be used in a dissertation, presentations, and/or academic journals for educational purposes.

I would like to invite you to participate in the study, which involves a 1-hour interview regarding the design of the exhibition or the interpretive approaches used in Playscape. The interview will be conducted one-on-one in a private room and will be audio-recorded.

You will receive no direct benefit from participating in this study; however, the results will help museum staff better understand the types of support that caregivers of young children need so that the museum can offer appropriate exhibit features and interpretive assistance that meets their needs and suits their parenting styles.

There are no foreseeable risks to participating in this study; however, if you feel uncomfortable during the interview, you may stop, skip any question, or withdraw from the study at any time. Your privacy and confidentiality will be strictly protected. Your name will not be documented in any form. The audio recording will not be disseminated. It will be stored securely in an office at the university. The recording will be transcribed and destroyed immediately when the transcription is complete.

Participant’s Agreement:

I have been asked to participate in a study about adult-child interactions in a museum exhibition that is designed for early childhood learning. The goal of the study is to understand the effects of exhibit design and program arrangements on family interactions and adults’ involvement in children’s activities in the early childhood exhibition.
I have been asked to participate in an interview regarding the exhibit design or interpretive approaches that take place in Playscape exhibition. I understand that the use of voice recorders will allow the researcher to document the conversations I have with the researcher.

My participation is voluntary. My decision whether or not to participate in the study will not affect my current and future employment at the Children’s Museum of Indianapolis. My privacy will be protected. My personal identification will be kept strictly confidential.

I have been told that the interview will be audio-recorded and will last no longer than an hour. I understand that I can withdraw from the study at any time if I feel uncomfortable with the study during the museum visit. I have been told that I can ask that the voice-recorder be turned off at any time.

I have been given an opportunity to ask any questions I may have regarding the study. I understand that the study is conducted under the direction of Dr. Laura Hetrick. If I have any additional questions about the study, I may contact the researcher, Wasana Sriprachya-anunt, at 412-551-2011 or via email at sriprac2@illinois.edu or I may contact Dr. Laura Hetrick at the University of Illinois, Urbana-Champaign at 217-333-0855 or via email at laurajh@illinois.edu. I have received a copy of this form.

If you have any questions about your right as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at 217-333-2670 (collect calls will be accepted if you identify yourself as a research participant) or via email at irb@illinois.edu

Please sign your name below if you agree to participate in the study and grant permission for the use of this information for a dissertation, educational presentations, and/or academic journals.

__________________________________________  _________________________
Participant’s Signature                      Date

__________________________________________  _________________________
Researcher’s Signature                      Date
APPENDIX B

INFORMED CONSENT LETTER FOR INTERPRETERS

Wasana Sriprachya-anunt (Researcher)  Laura Hetrick, PhD (Research Supervisor)
PhD Candidate in Art Education  Assistant Professor in Art Education
University of Illinois, Urbana-Champaign  University of Illinois, Urbana-Champaign
412-551-2011  217-333-0855
sriprac2@illinois.edu  laurajh@illinois.edu

I am a doctoral candidate in art education at the University of Illinois, Urbana-Champaign. I am conducting a study focusing on adult-child interactions in a museum exhibition that is designed for early childhood learning.

The goal of the study is to understand how exhibit features and interpreters’ assistance affect adults’ involvement in children’s activities in Playscape exhibition. Results from this study will help museum staff identify ways to improve the design of the exhibit and museum services so that they meet the needs of adult caregivers. The results will also be used in a dissertation, presentations, and/or academic journals for educational purposes.

I would like to invite you to participate in the study, which involves a 1-hour observation of your interactions with family visitors in Playscape and a half-an-hour interview regarding the interpretive approaches used in Playscape. I will only take notes of your behaviors and interactions with family visitors in Playscape. No voice recorders will be used in the exhibition. The interview will be conducted one-on-one in a private room and will be audio-recorded.

You will receive no direct benefit from participating in this study; however, the results will help you better understand the types of support that caregivers of young children need so that you and the museum can offer appropriate assistance that meets their needs and suits their parenting styles.

Participating in the study may involve minimal risks. You may experience temporary emotional distress when you are being observed in Playscape exhibition and being audio-recorded in the interview. I assure you that the observation is not intended to evaluate your performance and will not affect your employment. The purpose of the observation is to better understand how the Powerful Interaction works in practice and how it influences adult involvement in children’s play. If you feel uncomfortable during the observation or the interview, you may stop, skip any question, or withdraw from the study at any time.

In addition, I ensure you that confidentiality will be protected. Your name will not be documented. The audio recording will be stored securely in an office at the university. The recording will not be disseminated. It will be transcribed and destroyed immediately when the transcription is complete.

I have been asked to participate in a study about parent-child interactions in a museum exhibition that is designed for early childhood learning.
I have been asked to participate in an interview regarding the interpretive approaches that take place in Playscape exhibition. I understand that the use of voice recorders will allow the researcher to document the conversations I have with the researcher. I have been told that the researcher will also conduct a 1-hour observation and take notes of my interactions with family visitors in Playscape exhibition.

My participation is voluntary. My decision whether or not to participate in the study will not affect my current and future employment at the Children’s Museum of Indianapolis. My privacy will be protected. My personal identification will be kept strictly confidential.

I have been told that the interview will be audio-recorded and will last no longer than an hour. I understand that I can withdraw from the study at any time if I feel uncomfortable with the study during the museum visit. I have been told that I can ask that the voice-recorder be turned off at any time.

I have been given an opportunity to ask any questions I may have regarding the study. I understand that the study is conducted under the direction of Dr. Laura Hetrick. If I have any additional questions about the study, I may contact the researcher, Wasana Sriprachya-anunt, at 412-551-2011 or via email at sriprac2@illinois.edu or I may contact Dr. Laura Hetrick at the University of Illinois, Urbana-Champaign at 217-333-0855 or via email at laurajh@illinois.edu. I have received a copy of this form.

If you have any questions about your right as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at 217-333-2670 (collect calls will be accepted if you identify yourself as a research participant) or via email at irb@illinois.edu

Please sign your name below if you agree to participate in the study and grant permission for the use of this information for a dissertation, educational presentations, and/or academic journals.

_________________________________________  __________________________
Participant’s Signature                     Date

_________________________________________  __________________________
Researcher’s Signature                     Date
APPENDIX C
INVITATION FOR PARTICIPATION

Dear Family Participant

My name is Wasana Sriprachya-anunt. I am a doctoral candidate at the University of Illinois, Urbana-Champaign. My dissertation focuses on parent-child interactions in a museum exhibition that is designed for early childhood learning. If you have a child aged 3 – 5 years old, I would like to invite you and your child to come experience the Playscape at the Children’s Museum of Indianapolis. The admission will be covered for you and your child. The goal of the study is to gain an understanding of family interactions in the museum in order to provide service that will better meet the needs of you and your child.

The Playscape consists of many new interactive elements. Some of the highlights are a water feature that resembles a natural creek with a “raining cloud,” Art and Music studios, Reaction Contraption stations, and Blockopolis. As part of the study, you and your child will be asked to attach mini voice recorders onto your clothing before entering the exhibition. The use of voice recorders will allow me to document the conversations you may have about the exhibit elements. In order to protect your privacy, I will use pseudonyms (fake names) to collect, record, and report your interactions. I will also unobtrusively follow you into the exhibit to record your non-verbal behaviors.

Your participation is voluntary. Your decision whether or not to participate in the study will not affect your current and future relations with the Children’s Museum of Indianapolis. In order to thank you for your valuable time, you will receive a $15 meal coupon to be used at the cafeteria in the Children’s Museum of Indianapolis. If you agree to participate but feel uncomfortable with the study during the museum visit, you may withdraw at any time. Your participation will make a great contribution to the field of museum education. I would like to thank you in advance for taking your time to read this letter and I truly hope that you will decide to come and enjoy your time in Playscape with your child.
If you decide to participate, please sign below to give your consent to the museum to share your contact information with me and I will contact you briefly afterwards to schedule a museum visit.

Sincerely,

Wasana Sriprachya-anunt
Doctoral Student in Art Education
University of Illinois, Urbana-Champaign

I have read the above information. I agree to participate in the study of adult-child interaction in Playscape at the Children’s Museum of Indianapolis conducted by Wasana Sriprachya-anunt.

Name: ________________________________________________________________

Age of my child: _____________________________________________________

____________________________________________________________________  __________
Participant’s Signature                                                       Date
Dear Family Participant,

I am a doctoral candidate in art education at the University of Illinois, Urbana-Champaign. I am conducting a study focusing on adult-child interactions in a museum exhibition that is designed for early childhood learning.

The goal of the study is to gain a better understanding of how adult caregivers interact with children aged 3 – 5 years old in Playscape exhibition and what kind of support they need to better assist their children in learning. Results from this study will help museum staff identify ways to improve museum services so that they meet the needs of family visitors. The results will also be used in a dissertation, educational presentations, and/or academic journals in the museum education field.

I would like to invite you to participate in the study by making at least one visit with a child aged 3 – 5 years old to the Children’s Museum of Indianapolis. The study includes an observation and audio recording of a visit to the Playscape exhibition, a short questionnaire, and a follow-up interview. During an interview with the caregiver, I will provide a set of toy and some art activities for the child.

The direct benefits of the study are that family participants will be granted free admission and will also receive a $15 voucher when you complete a visit to the Playscape. The benefits of your participation go beyond personal experiences, as it will help not only the Children’s Museum of Indianapolis, but also other museums to better understand family interaction and the needs of adult caregivers so that museums can provide assistance that responds directly to their needs.

The risks of the study are minimal. Some personal identifying information will be collected and there is a potential risk of overhearing personal conversations between adult caregivers and children. Nonetheless, they are carefully mitigated by research procedures that aim to protect the privacy, confidentiality, and emotional distress of the participants. For example, participants will be audio-recorded during their visit to the Playscape and in an interview. These audio recordings will not be disseminated. They will be transcribed and destroyed upon the completion of the transcription. In addition, the caregivers may skip any question that they feel uncomfortable to answer or withdraw from the study at any time.
Participant’s Agreement

I have been asked to participate in a study about parent-child interactions in a museum exhibition that is designed for early childhood learning. The goal of the study is to gain an understanding of family interactions in the museum in order to improve services so that they meet the needs of family visitors.

I have been asked to visit the new Playscape at the Children’s Museum of Indianapolis with my child aged 3 – 5 years old. I have been asked to attach mini voice recorders onto my clothing and that of my child before entering the exhibition. I understand that the use of voice recorders will allow the researcher to document the conversations with my child about the exhibit elements. I have been told that the researcher will also observe and record non-verbal behaviors that I have with my child in the exhibition.

I am aware that the follow-up interview will also be audio-recorded and will last no longer than 45 minutes. I understand that I can withdraw from the study at any time if I feel uncomfortable with the study during the museum visit. I have been told that I can remove the audio recorders or ask that the recorder be turned off at any time.

The researcher has already reviewed the risks and benefits of this study with me. I have been informed that the audio recordings will not be disseminated. They will be transcribed and destroyed as soon as the transcriptions are completed. I am aware that data will be used in a dissertation, presentations, and/or academic journals for educational purposes.

My participation is voluntary. My decision whether or not to participate in the study will not affect my current and future relations with the Children’s Museum of Indianapolis. My privacy will be protected and my child’s and my full names will not be collected, recorded, and reported. All information will be kept strictly confidential. It will be kept in secured locations in a locked cabinet at home and at an office on campus.

I have been given an opportunity to ask any questions I may have regarding the study. I understand that the study is conducted under the direction of Dr. Laura Hetrick. If I have any additional questions about the study, I may call Wasana Sriprachya-anunt at 412-551-2011 or via email at sripac2@illinois.edu or I may call Dr. Laura Hetrick at the University of Illinois, Urbana-Champaign at 217-333-0855 or via email at laurajh@illinois.edu. I have received a copy of this form.

If you have any questions about your or your child’s rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at 217-333-2670 (collect calls will be accepted if you identify yourself as a research participant) or via email at irb@illinois.edu
Please sign your name below if you agree to participate and allow your child to participate in the study. By signing your name below, you allow your and your child’s museum visit to the Playscape and the interview to be audio recorded. You also grant permission for the use of this information for a dissertation, educational presentations, and/or academic journals.

______________________________  ________________________
Participant’s Signature        Date

______________________________  ________________________
Researcher’s Signature        Date
APPENDIX E

INFORMED CONSENT LETTER WITH AN INCREASE IN INCENTIVE

Wasana Sriprachya-anunt (Researcher)  
PhD Candidate in Art Education  
University of Illinois, Urbana-Champaign  
412-551-2011  
sriprac2@illinois.edu

Laura Hetrick, PhD (Research Supervisor)  
Assistant Professor in Art Education  
University of Illinois, Urbana-Champaign  
217-333-0855  
laurajh@illinois.edu

Dear Family Participant,

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The direct benefits of the study are that family participants will be granted free admission and will also receive a $25 voucher when you complete a visit to the Playscape. The benefits of your participation go beyond personal experiences, as it will help not only the Children’s Museum of Indianapolis, but also other museums to better understand family interaction and the needs of adult caregivers so that museums can provide assistance that responds directly to their needs.

The risks of the study are minimal. Some personal identifying information will be collected and there is a potential risk of overhearing personal conversations between adult caregivers and children. Nonetheless, they are carefully mitigated by research procedures that aim to protect the privacy, confidentiality, and emotional distress of the participants. For example, participants will be audio-recorded during their visit to the Playscape and in an interview. These audio recordings will not be disseminated. They will be transcribed and destroyed upon the completion of the transcription. In addition, the caregivers may skip any question that they feel uncomfortable to answer or withdraw from the study at any time.
Participant’s Agreement

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Please sign your name below if you agree to participate and allow your child to participate in the study. By signing your name below, you allow your and your child’s museum visit to the Playscape and the interview to be audio recorded. You also grant permission for the use of this information for a dissertation, educational presentations, and/or academic journals.

________________________________________  ___________________________
Participant’s Signature                      Date

________________________________________  ___________________________
Researcher’s Signature                       Date
Hello, my name is Wasana. I’m a student at the University of Illinois. I’m trying to learn about how you and your (adult’s relationship with the child such as mom, dad, grandma, aunt, sister, etc.) play together in Playscape. I would like you to help me by being in the study.

This study is like a detective game. Do you know what a detective is? (Wait for an answer) A detective secretly looks for the truth and is usually under disguise. I am going to be a detective and quietly follow you two in the exhibition. To win this game, you will need to act like you couldn’t see me and just talk or play with your (adult’s relationship with the child) as you normally would. I will ask you to attach this mini microphone to your top so that I can hear what you talk about.

Your (adult’s relationship with the child) is okay for both of you to be in the study. But if you don’t want to be in the study, you don’t have to. I won’t be upset if you don’t want to be in the study. You can also stop at any time.

Would you like to be in the study and play this detective game with me?

The child should give either a nod or reply “Yes” to be taken as assent to participate.

Name of Child (any one name): _________________________    ID: _____________________
Caregiver’s Informed Consent ID: _______________________
Child’s Voluntary Response to Participation: ☐ Yes    ☐ No
Signature of Researcher: _______________________________    Date: ________________
APPENDIX G

SEMI-STRUCTURED INTERVIEW QUESTIONS FOR MUSEUM STAFF

For the senior exhibit developer and the exhibit designer

Guiding design concept
• What is the key concept guiding the design of the new Playscape?
• How does it differ from the concept of the old Playscape?

Exhibit content
• What do you want parents/caregivers to get out of the Playscape?
• What do you want children to get out of the Playscape? Is it different for children of different ages?

Learning theory on parental involvement
• Does TCM adopt any particular learning theory?
• How does learning theory affect exhibit elements such as seating, interactive elements, labeling, and types of toys?
• What role do you expect parents to play when they are in Playscape with their children?
• How do you define the term “scaffolding”?
• Which exhibit elements are designed to enhance parental scaffolding or even to scaffold parents in learning about child development?
• Do parents react to those exhibit elements differently?

Problematic question
• How does the design of the Playscape respond to diverse parental practices and parents’ perception of learning and play?

For the Director of Childhood Education and the Manager of the Interpretation Program

Development

• What is the role of an interpreter (or floor staff)?
• What kinds of interpretive approach were employed in the old Playscape?
• What is the interpretive approach currently used in the new Playscape?
  Probe: What does the Powerful Interactions approach entail?
    What is the goal of the new approach?
• What kind of interactions or behaviors do you expect to see an interpreter perform to be regarded as a successful use of Powerful Interactions?

For floor staff in Playscape

• What is your role in Playscape?
• How has your role changed from the old Playscape to the new Playscape?
• What does the Powerful Interactions approach entail?
• What is the goal of the new approach?
• Can you give me an example of a successful and a not-so-successful implementation of the Powerful Interactions?

Probe: When do you decide to or not to jump in and play alongside a child?

Do parents observe what you did and use it when they interact with their children?

Can you give me a few examples of instances when parents adopt your approach?
APPENDIX H

DEMOGRAPHIC QUESTIONNAIRE

I would like to invite you to participate in a study about adult caregiver-child interactions in Playscape exhibition at the Children's Museum of Indianapolis. The study is part of a dissertation on family learning in museums. Your participation is voluntary. Your decision whether or not to participate in the study will not affect your relationship with the museum. Your participation will help museum professionals better understand the needs of adult caregivers and children in the museum.

If you agree to participate in the study, you are asked to make at least one visit to the Playscape with one child aged 3 – 5 years old. I will observe and document your interactions with your child and then interview you regarding your experience in Playscape. In order to thank you for your valuable time, you and one child aged 3 – 5 years old will be granted free admission and receive $15 meal coupon to be used at the cafeteria in the museum.

If you are interested in participating in the study, please fill in the following information. The questionnaire will take less than 5 minutes to complete. I truly appreciate your time and consideration.

1. How should I address you? Please provide your name (it can be either first name, last name, OR nickname).

[ ] [ ]

2. Which category below includes your age?

☐ 17 or younger
☐ 18 – 19
☐ 20 – 29
☐ 30 – 39
☐ 40 – 49
☐ 50 – 59
☐ 60 or older

3. How many children, by age, currently live in your household?

<table>
<thead>
<tr>
<th>Age Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 3 years old</td>
<td></td>
</tr>
<tr>
<td>3 years old</td>
<td></td>
</tr>
<tr>
<td>4 years old</td>
<td></td>
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<tr>
<td>5 years old</td>
<td></td>
</tr>
<tr>
<td>6 years old or older</td>
<td></td>
</tr>
</tbody>
</table>
4. What is the primary language you speak with your child? (Please choose only ONE)

- [ ] Chinese
- [ ] English
- [ ] French
- [ ] German
- [ ] Italian
- [ ] Tagalog
- [ ] Vietnamese
- [ ] Other/multiple languages (please specify)

5. In what ZIP code is your home located? (Please enter 5-digit ZIP code; for example, 94305)


6. What is the best way to contact you? (Please provide at least one method of communication)

- Email address: 
- Phone number: 

7. If by phone, what are the best times and days to contact you? (Please choose all that apply)

<table>
<thead>
<tr>
<th></th>
<th>Before 9 am</th>
<th>9 – 11 am</th>
<th>11 am – 1 pm</th>
<th>1 – 4 pm</th>
<th>4 – 7 pm</th>
<th>7 – 9 pm</th>
</tr>
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<tbody>
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</tr>
</tbody>
</table>

Thank you very much for your interest in participating in the study. I will contact you shortly to confirm your participation. If you have any question regarding the study, please contact me at sriprac2@illinois.edu.

Sincerely,
Wasana

Wasana Sriprachya-anunt
Doctoral Candidate
Art Education Department
University of Illinois, Urbana-Champaign
APPENDIX I

ADULT CAREGIVER QUESTIONNAIRE

Date: ___________________________  Family ID ____________

1. Age(s) of Adult Caregiver(s)
   - □ 18 – 20  □ 21 - 29  □ 30 – 39  □ 40 – 49  □ 50 – 59  □ 60 or older

2. Age(s) of Child(ren)
   - □ 3 years old  □ 4 years old  □ 5 years old

3. What is the highest level of education that you have completed?
   - □ Less than high school degree
   - □ High school degree or equivalent (e.g., GED)
   - □ Some college but no degree
   - □ Associate degree
   - □ Bachelor degree
   - □ Graduate degree

4. How often do you visit the Playscape?
   - □ This is the first time
   - □ Once a week
   - □ 2-3 times a month
   - □ Once a month
   - □ Once every other month
   - □ 2-3 times a year
   - □ Once a year
   - □ Others, please specify ______________________________

Additional comments:

________________________________________________________________________

________________________________________________________________________
5. Please rate the following statements that best describe your belief toward children’s learning in the museum:

**Adults need to actively direct/supervise the child’s activities.**

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neutral</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
<th>N/A</th>
</tr>
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</table>

**Adults should facilitate the child’s activities by providing cues and explanation.**

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<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neutral</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
<th>N/A</th>
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**Adults should play alongside the child.**

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neutral</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
<th>N/A</th>
</tr>
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<tbody>
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</table>

**Adults should adjust support to allow the child to become more independent.**

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neutral</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

**Adults should choose an activity that is best for the child.**

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neutral</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
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APPENDIX J

OBSERVATION FOLLOW-UP INTERVIEW QUESTIONS FOR CAREGIVERS

Introductory Questions

1) How is the Playscape?
2) Which exhibit area did you enjoy the most?
3) Did you notice if your child liked any exhibit element in particular? Why might that be?
   Probe: Was it something that s/he usually played, for example, at home or somewhere else?

Observation Follow-up Questions adapted from Beaumont (2006)

4) Can you tell me more about what you were trying to do with your child at name of the exhibit element?
   Probe: I notice that you were ________________ (refer to observation notes)
   What do you think your child was trying to achieve when he/she was ________________ (refer to observation notes)

5) What is the best way for your child to learn?
   Probe: Does he/she learn best by playing alone or receive some guidance?
   Does he/she need you to be close by?

6) How do you perceive your role when you are in Playscape with your child?
   Probe: How do you help your child learn in Playscape?
   Do you usually observe and let him/her play?
   When do you jump in and participate in his/her activity?
   How might your child’s experience be different if he/she comes here with a school group or other caregiver?

7) Do you notice what other parents do with their children? If so, what do they tend to do?
   Probe: Is it good or bad for children, or you have not thought about it?
   How does it affect the way you interact with your child?

8) How does the exhibit elements assist or restrict you in helping your child learn?

9) For a family who has been to the old Playscape:
   How is the new Playscape different or similar to the old one?

10) For a family who interacts with an interpreter:
    How does the presence of the interpreter help or interfere with your interaction with your child and/or your child’s learning?

11) Does this museum visit impact your child’s learning?
    Probe: What do you think your child learn from the Playscape visit?

12) What can the museum do to help you in your role as a parent/caregiver in order to make your experience in Playscape extraordinary as suggested in the mission of the museum?
Questions about the Educational Resources and Adult-Child Interactions outside the Museum

13) With whom does the child spend most of his/her time?
   Probe: Siblings, parents, kids in the same neighborhood, etc.?
14) What does the child usually do in his/her free time?
   Probe: What does s/he play? Who usually plays with her/him?
15) What do you usually do in your free time?
   Probe: What is your hobby? What kind of game do you play?
16) What kind of activity do you usually do with the child?
APPENDIX K

OBSERVATION FOLLOW-UP QUESTIONS FOR REPEATED VISITS

Can you rank the purposes for your normal visit to Playscape according to the level of
certainty for your child? (1 = most important, 5 = least important)

___ To have fun/To play
___ To explore different media/options
___ To interact with other kids
___ To acquire new knowledge or skills i.e. predicting the trajectory of the ball, learn new vocab
___ To master your child’s existing knowledge or skills i.e. counting, spelling, shapes, colors
___ To spend parent-child time together
___ Other, please specify ______________________________________________________

Exhibit elements (Add number in order)

__ Creek __ Climber __ Sand __ Hands-Can __ Art Studio __ Costume
__ Music __ Reaction __ Whirly Tower __ Tracks __ Blockopolis __ Babyscape

Interview Questions

Have you visited Playscape again since the last time we visited together?
If yes, how many times? Notice any changes in your child’s preferences or behaviors?
Do you think the importance of each option changes with the age of the child? Please explain.
What is your overall impression of today’s visit?
Is there anything that particularly stands out to you in terms of your child’s development in how s/he plays with different things?
Can you please tell me more about what you did with your child at _____? (Include all elements)
What did you hope her to get from doing X or asking X?
I notice that you often pose some task to your child, what is the benefit of giving him/her a task
or a challenge to complete?
Do they learn more with or without challenge?
What kind of information or pictures can be added to help extend your conversation or interaction with your child?
Would you be interested to know what kind of games or challenge other parents come up at each exhibit area?
APPENDIX L

RESEARCH IN PROGRESS SIGNAGE

You may be observed and/or audiorecorded in certain areas of the Playscape

Research in Progress

What: The research is conducted as part of a dissertation in Art Education at the University of Illinois.

Why: The goal of the study is to gain a better understanding of family interactions and how floor staff's assistance affect family interaction in Playscape in order to improve services so that they meet the needs of family visitors. Please proceed normally.

Transcripts of conversations and documentation of behaviors will not be used for commercial purposes, but may be used in a dissertation, presentation, and/or academic journal for educational purposes. For questions or concerns about the study, please contact the researcher, Wasana Sriprachya-anunt, at sripacr2@illinois.edu or Professor Laura Hetrick at the University of Illinois, Urbana-Champaign at 217-333-0855 or via email at laurajh@illinois.edu.

If you have any questions about your or your child’s rights or any concerns or complaints, please contact the University of Illinois Institutional Review Board at 217-333-2670 (collect calls will be accepted if you identify yourself as a research participant) or via email at irb@illinois.edu
APPENDIX M

PLAYSCAPE FLOOR PLAN
# APPENDIX N

## LIST OF MUSICAL INSTRUMENTS IN PLAYSCAPE

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wrist Bell</td>
<td></td>
</tr>
<tr>
<td>Egg Shaker</td>
<td></td>
</tr>
<tr>
<td>Frog Rasp</td>
<td></td>
</tr>
<tr>
<td>Clatterpillar (aka Kokiriko)</td>
<td></td>
</tr>
<tr>
<td>Mallet</td>
<td></td>
</tr>
<tr>
<td>Maracas</td>
<td></td>
</tr>
<tr>
<td>Hapi Drum</td>
<td></td>
</tr>
<tr>
<td>Tongue Drum (aka Slit Drum)</td>
<td></td>
</tr>
<tr>
<td>Xylophone</td>
<td>(The bars are made of wood)</td>
</tr>
<tr>
<td>Glockenspiel</td>
<td>(German-origin, the bars are made of steel, smaller than xylophone)</td>
</tr>
<tr>
<td>Metallophone</td>
<td>(The bars are made of aluminum alloy)</td>
</tr>
</tbody>
</table>