Preparing Young Children to Respond to Art in the Museum

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ABSTRACT

Preparing Young Children to Respond to Art in the Museum

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This thesis describes a research study which the Investigator prepared and documented. It involved two groups of five kindergarten children who were prepared by the Investigator to view one artwork in a museum. Children were prepared to view the artwork by exploring and solving open-ended design problems with large shapes, one-third the size of those in the artwork. The Investigator guided children to respond to the artwork through inquiry and discovery activities related to the artwork's specific characteristics. Findings revealed that kindergarten children enjoyed exploring large shapes and were capable of solving collaborative design problems with the shapes, which prepared them to respond to an artwork with similar shapes.

Key words: Museum, kindergarteners, previewing experience, collaborative, open-ended problem solving.
Acknowledgments

The author would like to acknowledge the following organizations: Brigham Young University (BYU) for its generosity in providing her with a grant to take part in the "Study Group from United States: Poetics, Aesthetics and Learning," March 6-9, 2009; the Honors Department, Brigham Young University, for subsidizing her Pembroke Kings Program study abroad courses at Cambridge University, July and August 2011; and the Reggio Children organization that granted her permission to use photographs from the book, Children, Art, Artists the expressive languages of children, the artistic language of Alberto Burri.

The author would also like to thank the following BYU and Cambridge University faculty members: Mark Graham, my advisor and chair of the Visual Art Education Department, BYU; Rita Wright (former BYU faculty member), Cheryll May and Lynda Palma, Museum of Art (MOA), BYU; Anne Ure, Child and Family Studies Laboratory, BYU; Lane Fischer and Sandy Munoz, Internal Review Board, BYU; Dave Bigler, Psychology Department, BYU; Quina Hoskisson, Humanities Department, BYU; Sharon Heelis, Visual Art Department Secretary (Ta-Dah!), BYU; Sharon Gray and Daniel Barney, committee members, BYU; Emily Guerry, David Oldfield, and Thomas Newbolt, Cambridge University; and Paul Kerry, History Department, BYU; who was responsible for my unforgettable experience in Cambridge.

Without the continued and loving support of my family, (and friends- Powers, Judy B., Grows, Kate, Julie, Mary Lou, and others) however, this thesis project would never have been possible. Thank you, Charles, Mary (who suggested I enroll in the program), Malcolm, James, Annie (“just push through it”), Alex, Gary, Jinny, and Buddy (“Let me know when you walk.”).

And thanks to the children who made the journey worthwhile.
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Personal Narrative

It is important to consider who young children are and what they can achieve when preparing meaningful educational experiences for them. When I consider the attributes and potential of young children I am reminded of a quote from the 2009 Reggio Children's exhibit Una Citta Tanti Bambini, in Reggio Emilia, Italy, which read,

"Who am I then? Tell me that first of all," asks Alice in Wonderland. Alice's question is an open question…a sort of guiding direction. Alice…represents a dream, the idea of risk, the possibility of turning rules upside down and of seeing children as people capable of moving through this "wonderland" world, of 'reading' it and interpreting it. Children are capable of interpreting their world, and in the process, discovering who they are, if they have a desire to interact with it. Through interaction children construct knowledge about the world and themselves (Swann, 2008). The arts, which add color and expression to a child's world make it more desirable, and give children an opportunity to communicate their perceptions of it in nonverbal languages they understand. Artistic experiences of quality are important for young children because they give form to their expressive thoughts and feelings.

Not all artistic experiences for young children are equal, however. I have observed many arts-based educational experiences for children in New York City, Washington D.C., Palo Alto, California, Utah, and Italy. Of the experiences observed, the most comprehensive, in my opinion, occurred in the Metropolitan Museum of Art (2007), the visual arts-based schools of Reggio Emilia, Italy (2009), and the Museum of Art, Brigham Young University (2009).
Metropolitan Museum of Art, September 2007

In the fall of 2007, I observed a tour for preschoolers, about ten in number, and their parents at the Metropolitan Museum of Art. The tour was led by a relaxed and confident docent who was comfortable with small children and very familiar with the museum and artifacts she was discussing. She led the children on long walks through the museum to find three, large three-dimensional artworks. With enthusiasm she asked them questions about each artifact’s materials and characteristics. At times she had the children physically engage with an experience. For example, before entering a Ming rock garden she helped the children calm down by demonstrating how to take deep breaths. Once inside the garden, she had them practice their breathing in the lotus pose. The tour was successful, in my opinion, because of her captivating stories about the times and people surrounding each artwork, her invitation to have the children sit on the floor to listen and view artworks, and the presence of the children's parents.

Reggio Emilia, Italy, March, 2009

As a part of the Reggio Emilia "Study Group from United States: Poetics, Aesthetics and Learning," I was given an opportunity to visit several Reggio Emilia preschools. The schools are professionally designed to create an attractive learning environment for young children. While visiting the schools, our study group took part in a workshop that gave us first-hand experience with processes and materials used by the preschool children to create the exhibit Children, Art, Artists the expressive languages of children, the artistic languages of Alberto Burri. Children prepared for the exhibit over a period of three months by working with materials and processes similar to those used by the artist. The compositions children created for the exhibit were featured in a book with the same name as the exhibit. According to the book, the compositions children created prepared them to respond to Burri’s artworks.
Our study group also attended a lecture about The Crowd project carried out by a Reggio Emilia preschool class in 1994. The focus of the project was the human figure placed within the living context of a crowd. The project was based on the concept that young children understand intuitively that all things exist within a living context, and that their identity is shaped by that context. The project was introduced by a teacher reading a child's description of a crowd, who referred to it as "a sea of arms and legs." The child-like metaphor prompted a lively discussion about crowds without the need for any pictures of a crowd. The discussions led to drawings of crowds, paintings of crowds, and three-dimensional images of crowds. Over a period of three months the project began to focus on the identity of individuals within the crowd, or the human figure. The lecture helped our study group to realize that children are highly intelligent and capable when they are allowed to creatively interact with their environment to explore concepts with which they have some previous experience. It also showed how group discussions and critiques with adults and peers expand children’s concepts and images.

The Museum of Art, Brigham Young University, September, 2009

Opening night for the Walter Wick Exhibit, in the Museum of Art at Brigham Young University, entitled, Wick at Night, attracted over one thousand guests, most of which were families with children. The exhibit's appeal was most likely due to Wick's I Spy books. Nearly every child had seen one of Wick's I Spy books before visiting the museum and they took great delight in finding Seymour in many of the artist's prints. The evening's allure was also due to the nature of the artist's works which were photographic prints of handmade puzzles, games, "gadgets and gizmos" (Wick at Night banner), along with a three-dimensional model of A Scary,

1 The quote was mentioned in a lecture given by Vea Vecchi in Reggio Emilia, Italy, March, 2009.
2 Seymour is the little hidden man in Wick's I Spy books that children try to find.
Scary, Street, Puss and Boot's Castle, and a city called Sky High. As added attractions, guests were entertained by dancers that reflected Wick's artworks, and were given an opportunity to dance to music simulating the sounds of his imaginary objects. A lecture and video by the artist about his balloon-popping gadget made from small everyday items and toys, such as dominos, small balls, and a pencil, was particularly enjoyable for young audiences and their parents.

One little boy who attended the lecture volunteered to demonstrate to the audience how the gadget worked. He confidently walked to the front of the auditorium and with calm delight, perfectly traced the path of the ball with a laser Stylus that eventually popped a red balloon. After his demonstration, I commented to his mother that he had delivered an impressive performance. She said she was surprised because he was normally very shy. Obviously, the balloon- popping machine had won his undivided attention. When the evening was over, I overheard one little boy say to his father, "That was fun Dad. We'll have to come back again!"

Conclusion

The artistic learning experiences for young children that I observed in the Metropolitan Museum of Art, Reggio Emilia schools in Italy, and the Museum of Art at Brigham Young University, were memorable and inspiring to children and adults. Each experience was unique but also shared similarities i.e., children were happy and interested in what they were learning; the experiences encouraged interaction with peers, adult guides, and attractive objects, and occurred in professionally designed spaces. The intent of this thesis study is to combine elements of each of the art education experiences described in a previewing experience that prepares young children to respond to art in the museum.
**Introduction**

This thesis describes a research study of kindergarten children in an art museum setting. The Investigator designed, prepared, and documented the results of the study, which involved two groups of five,\(^3\) five and six-year-old children in a collaborative previewing experience that prepared them to respond to an outdoor sculpture. The study is based on the hypothesis that collaborative previewing experiences that allow children to explore materials and processes related to an artwork before viewing it or any reproduction, prepare them to respond to it. One of the purposes of the study was to prepare children to respond to an outdoor sculpture, and another was to document and analyze their responses to the experience. The Investigator tested the hypothesis by creating a previewing experience that allowed children to explore ten large shapes, one-third the size of the shapes in the artwork, find similar shapes in a poster, and create collaborative compositions with shapes, in response to open-ended design problems given by the Investigator. After children discovered the sculpture and responded spontaneously to it, the Investigator continued to test the hypothesis through inquiry and game-like discovery methods related to its specific characteristics. Inquiry and discovery methods provided a means through which the Investigator examined whether or not children had become aware of differences in composition, materials, weight, size and placement of the sculpture compared with those of their own compositions.

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3 Lane Fischer from the Internal Review Board, Brigham Young University, determined in June, 2010, that ten children, in two groups of five, would make an adequate sample for this study.
Art Making Previewing Experiences Uncommon

Previewing experiences in art museum settings that prepare young children\(^4\) to better appreciate artworks through hands on experiences related to them are not common. Young visitors are most often welcomed into museum galleries to enjoy "pictures [and] conversations" (Carroll, 2009, p. 12), stories, costume tours, "mini tours… touch-me installations… and treasure hunts" (Gorman, 2006, p.1). Hands- on previewing experiences would allow children to engage in artistic processes that help them to realize that "one activity leads organically into another [creating] a sense of connectedness…between making and perceiving art… and that both are mandatory parts of the communicative nature of art" (Anderson, 1986, p. 5).

Research on Collaborative Previewing Experiences

Documented research which includes collaborative previewing experiences that prepare kindergarten children to respond to artworks in museum-like settings are limited and include studies by Piscitelli & Weier (2002), Vecchi (2004), and Danko-McGhee (2009). These studies differ significantly from my study, but contribute to the limited research available on young children’s learning in museum settings. In 2000, Piscitelli and Anderson wrote,

Furthermore, there are no known studies and few policy documents on the position of young children in museum culture, despite the fact that children are enthusiastic museum visitors. Given these general conclusions, it would appear that there is a need for a thorough investigation of children’s experiences and perceptions of their museum encounters. Such research would inform museum communities about the experiential aspects which children find most rewarding, and assist in the developmental aspects of

\(^4\) Defined by Tarr (2009) as children 0-8 years old.
exhibitions and programs which have educational and experiential impact for young visitors (p. 3).

**Piscitelli & Weier (2002)**

Studies by Piscitelli & Weier (2002) documented the experiences of young children with *The Art of Eric Carle Exhibit*, (1998) at the Queensland Performing Arts Center, Brisbane, Australia. Fifty of the artist's works were displayed in an "indoor, interactive exhibition space, which, included zoned play areas where children drew, solved puzzles, climbed, chanted, sang, read, watched videos, and listened to stories" (p. 133). The exhibition space also included an outdoor art studio where children explored materials and processes related to Carle's artworks before or after viewing them.

Piscitelli & Weier’s study differs significantly from my research study in the following ways. First, it involved four thousand encounters with children, parents and guides, and "fifty original artworks" (Piscitelli & Weier, 2002, p. 133). Second, it took place in a huge exhibition center that housed many interactive activity areas, and finally, art making previewing and post viewing experiences were considered of equal importance.

**Vecchi (2004)**

Vecchi’s study (2004) prepared preschool through middle school-aged children in classrooms and expressive workshops to view *The Burri Collection Exhibit* in Reggio Emilia, Italy. In classrooms, over a period of one to three months, young children explored elements of Burri’s works and processes that their teachers thought were appropriate for children. After working on their own compositions, children were taken to view Burri’s works. Children's compositions were later displayed in the exhibit, *Children, Art, Artists the expressive languages of children, the artistic language of Alberto Burri*, which is also the name of the book featuring
their compositions. In the book, children are pictured standing very close to Burri’s works looking as though they are studying them intently, which suggests that their previewing experiences prepared them to respond to his pieces with genuine interest.

Significant differences exist between the Burri study and my study. Children in Reggio Emilia, Italy were prepared to view an artist’s works over a period of one to three months in classrooms and workshops, as opposed to my study of ten children, who were prepared to respond to a single artwork in one visit to an art museum. Also, children in Reggio Emilia created many individual and collaborative compositions from many materials that related to the artist’s two-dimensional works. Children in my study created a few collaborative compositions from geometric shapes as a response to open-ended problems related to a single three-dimensional artwork. Finally, the works of the children in Reggio Emilia, Italy were displayed in a municipal exhibit, which opportunity did not exist for my study.

Danko-McGhee (2009)

Danko-McGhee’s study (2009) documented children's responses to the newly renovated (2005) Family Center in the Toledo Museum of Art in Ohio. The purpose of the center was to provide pre and primary-aged children with a stimulating learning environment that prepared them to view artworks in the museum, and certain city attractions in Toledo. The Family Center was also designed to expose pre-service teachers in early childhood education to an attractive learning environment for young children. Three significant differences exist between Danko-McGhee's study and my study. First, the Family Center offered many activity areas for “art/play” (p. 4) experiences, which did not exist in the Museum of Art (MOA) at Brigham Young University, where my study was conducted. Second, the Family Center prepared many children and their families to view many artworks in the museum along with attractions in the city, in
contrast to my study which prepared ten children in the Theater/Orientation room of the MOA to view one artwork in a museum setting. Finally, Danko-McGhee's study did not document the responses of children to the original artworks they prepared to view, which my study did.

Conclusion

In conclusion, this thesis describes a unique study of kindergarten children in an art museum setting. The Investigator designed and documented the study, which prepared young children to respond to an outdoor sculpture through explorations with large shapes, and the creation of collaborative compositions with the shapes in response to open-ended design problems given by the Investigator. The study was based on the hypothesis that art making previewing experiences related to artworks in a museum setting prepare young children to respond to them. One of the purposes of the study was to prepare children to view an outdoor sculpture, and another was to document and analyze children's responses to the experience.

Kenneth Kosik MD and Co-Director of the Neuroscience Research Institute at the University of California, Santa Barbara, said "... getting the data- learning by detailed observations of children and teachers in the classroom-should be the priority for education research" (2009, p. 8). It is hoped that this study will illuminate the potential of previewing experiences to enhance children's interaction with and understanding of museum objects.
**Literature Review**

This review discusses in detail the three studies mentioned in the Introduction that reference previewing experiences for young children designed to prepare them to respond to artworks in a museum setting. It also discusses research supporting key components of the previewing and viewing experiences of my study. Previewing components include (1) the art museum environment; (2) exploration of materials; (3) collaboration; (4) open-ended problem solving methods; (5) the use of large three-dimensional shapes as artistic material. Viewing components include inquiry and game-like discovery methods related to specific characteristics of the artwork.

**Piscitelli & Weier (2002)**

Piscitelli and Weier (2002) conducted the study, *Learning With, Through, and About Art: The Role of Social Interactions*, in the Queensland Performing Arts Center, which describes young children's experiences with art making processes related to the artist’s works, which could be experienced before or after viewing them. The primary purpose of the study, however, was to provide “a high-quality visual arts experience in a prepared environment, and to promote learning through purposeful activities and meaningful interactions” (p. 153). A two-hour program was designed for all participants, which included young children and their families, and consisted of a short orientation, and equal amounts of time in the exhibition’s interactive areas and outdoor art studio.

Art studio experiences occurred before or after viewing Carle’s works, and included “exploration and experimentation with art processes” (Piscitelli & Weier, 2002, p. 137) related particularly to the artist’s paintings and collages. The study states that in the studio, children
often helped one another solve artistic problems. It also described two kinds of adult interaction with children in the studio. “Guided [adult interaction occurred when children] were experiencing difficulties, lacked inspiration, or required a starting point [and] nondirective [adult] behaviors… [included] watching, commenting, or remaining close by” (p. 143).

When helping children to respond to artworks, guides used a variety of “scaffolding [and] nondirective” (Piscitelli & Weier, 2002, p. 127) methods. Scaffolding techniques included questions regarding artworks, helping children to describe what they saw, providing information, reading labels, remembering personal interests of children that relate to artworks, imagining and wondering about artworks with children, and asking children to justify their conclusions about artworks. Guides interacted with children in nondirective ways through “physical proximity, listening, acknowledging, commenting, encouraging, praising, and modeling” (p. 127).

The Queensland project also developed “a set of standards describing conditions supporting high quality experiences for young children in museums and other informal learning settings” (Piscitelli & Weier, 2002, p. 122). Three components of the museum learning experience were determined to be of consequence: The physical environment, the program, and the social environment. “Spatial arrangements and aesthetics” (p. 124) and interactive opportunities that invited hands-on, play-like activities were determined to be important characteristics of physical environments. Guides that understood children’s developmental needs, and who related museum experiences to children’s past experiences and interests, were determined as necessary essentials to sound museum programming for young children. Socially, guides that “convey a sense of happy involvement and fun for all children” (p.126) were considered important, as well as knowing when to listen and watch children, and when to guide them into more meaningful relationships with artworks and others. The study also determined
that “the social facilitation by trained guides…most significantly affected children’s experiences” (p. 138).

The Queensland, Art of Eric Carle study parallels my project in two significant ways. First, it involved hands-on, previewing experiences for young children, that in some instances were collaborative, and second, it involved constant adult guidance whether direct or indirect. The differences between the studies were obvious ones of scale and scope, but also of importance was the different emphasis the Queensland project placed on the timing of hands on studio experiences, which could be experienced before or after viewing artworks. The concept of art processes leading to the creation of artworks is emphasized in my project, unlike the Queensland project.

**Vecchi’s Study (2004)**

Vea Vecchi is co-editor of the book *Children, Art, Artists the expressive languages of children, the artistic language of Alberto Burri* (2004), which represents the culmination of a study designed to prepare preschool children in Reggio Emilia schools to view *The Burri Collection Exhibit*. The book features children's compositions created through their explorations of materials and processes used by the artist that teachers thought were appropriate for young children, such as, “the chromatic identity (painting with material), [their] variation (tactile, perceptual, compositional), transformability, [and] intensity in the way of looking at everyday objects” (p. 11). Children explored “blacks and whites” (Quinti, 2004, p. 40) in fabric, buttons and string; clear and colored plastics; natural materials; metals and woods; and other materials. Children explored the suggested materials and processes before viewing the artist's works "to avoid any formal copying of [his] works…and, rather, to grasp [children's] poetic suggestions for
approaching things" (p. 10). A few of the compositions young children created are shown below, with permission from Reggio Children, Reggio Emilia, Italy.\footnote{Per correspondence with Annamarie Mucchi on (9/17/2009), the following must accompany Figures 1-3: “From the book “Children, Art, Artists the expressive languages of children, the artistic language of Alberto Burri,” copyright 2004 Preschools and Infant Toddler Centers –Instituzione of the Municipality of Reggio Emilia-Italy, published by Reggio Children.”}

![Figure 1. Reggio Children, “I’m going to put these circles in the corners—perfect!” 2004. Digital photography.](image)

Referring to the composition shown in Figure 1, five year-old Lorenzo made the comment quoted above, and then added, “You need four [buttons] because there are four corners” (Vecchi, 2004, p. 42). Edoardo, five-years-old, discovered, “We can wind the string around the circles” (p. 42)! And Sarah, five-years-old, later added to this collaborative composition.

Similarities between the button composition (Figure 1) and compositions made by children in my study include: The use of monochromatic color schemes—white for the Reggio
Emilia study, and red for my study; the explorative and collaborative nature of both studies; and the aesthetic sensibility and resolution of compositions in both studies.

Differences between the composition with buttons and those with shapes include processes and materials that were used to generate them. In Reggio Emilia schools, children were freely exploring “blacks and whites” (Vecchi, 2004, p. 40) with small buttons, fabric, string and other everyday materials, and children in my study were solving guided open-ended problems with unusually large, red, dense-foam shapes.

Figure 2. Reggio children, “It’s really beautiful. I’d call it ‘Angel Lightness’.” 2004. Digital photography.

Nicolo, five-years-old, is quoted in the caption of Figure 2. Five-year-old Camila worked with Nicolo on the composition. It began with Nicolo saying, “We’ll take a few things, and we need some string to divide the composition…First we need a sheet of white paper, because the gray table really isn’t very pretty” (Vecchi, 2004, p. 41)!

‘Angel Lightness’ reflects many similar elements mentioned in relation to the buttons composition and compositions created by children in my study with shapes. Components of the
Italian study, which included the use of monochromatic materials, collaborative effort, and aesthetic sensitivity, are reflected in components of the shapes study. In addition, there was an imaginative element reflected in the child's title, 'Angel Lightness,' which was also apparent in conversations between children creating compositions with shapes in the study I conducted.

Children in Figure 3 transformed a room with clear plastic, the transparent quality of which, was “in …[their] … hands, …scrutinized and explored, investigated and interpreted, in the dual, boundary-crossing identity of the immaterial material” (Vecchi, 2004, p. 62). About their new environment, one child said, “we felt like we were transparents” (p.63). Another said, “We put the power of the world in it” (p. 63). Again, and in similar fashion to children in my project, Reggio Emilia children, in collaboration, used a common material-transparent plastic- to create an environmental composition of extraordinary aesthetic appeal and enjoyment.

After exploring materials and processes related to Burri’s artworks for one to three months, children were taken to see his exhibit. In several instances, photos of children (Vecchi,
2004, pp. 134-135) taken while viewing the artist’s works showed them standing very close to his pieces, as if they were trying to figure out exactly what he did to produce certain effects. One child viewing a work said, “He [Burri] likes colors, like I do. That way, you can create more beautiful works” (p. 135). Children’s responses to the artist’s works suggested that the study’s previewing experiences were successful in preparing them to appreciate materials and processes similar to those used by Alberto Burri.

In summary, Vecchi’s study (2004) parallels my study in its use of explorative and collaborative previewing experiences conducted in stimulating environments- professionally designed Reggio Emilia classrooms, and an art museum- that prepared children to respond to artworks in a museum setting. The studies differ from one another in the following ways: Many of the Italian children were prepared to view artworks over a period of one to three months in classrooms and expressive workshops, unlike my project that prepared two groups of five children in an art museum in a single visit; children in Reggio Emilia schools were using many different materials, freely creating compositions both individually and collaboratively; and their artworks were displayed in an exhibit. In contrast, children in my study collaboratively explored large shapes through guided, open-ended design problems, and their compositions were not displayed in an exhibit.

**Danko-McGhee's Study (2009)**

Dr. Kathy Danko-McGhee, Early Childhood Art Education Coordinator at the University of Toledo, in Ohio, and consultant to the Toledo Museum of Art Early Childhood Programming (Danko-McGhee & Slutsky, 2007, p. 114) conducted the study, *The Environment as Third Teacher: Pre-service Teacher’s Aesthetic Transformation of an Art Learning Environment for Young Children in a Museum Setting*. The study included examples of previewing experiences,
but primarily addressed the need for stimulating learning environments for young children, which art museums have the potential to provide. She stated that,

In 1999, over 60% of U.S. children, ages three to five, spent their time in daycare centers and preschools (U.S. Department of Education, 2003)…[and] Gandini (1998) contends that early childhood educators are challenged by funding limitations, which results in, “…discouraging physical conditions, especially the lack of natural light and of cluttered space” (p.163). Such conditions result in poor learning environments (Danko -McGhee, 2009, pp. 1-2).

Danko-McGhee’s study in the Family Center of the Toledo Museum of Art provided many "art/play" (2009, p. 4) experiences for young children and their families related to their favorite exhibits. A display of tapestry chairs and fancy dinnerware was of particular interest to many children, which inspired the creation of an activity area. The area included a small table and chairs painted in antique gold, and upholstered in blue and gold tapestry similar to the exhibit chairs. Also, two brass-like candlesticks and a bowl of pretend fruit were placed on the table to stimulate dramatic play. Pre-service teachers who observed children interacting with the area wrote, “…children [were] working very hard on setting the ‘dinner table’ and preparing ‘a meal’, while others selected and coordinated outfits to wear” (p. 13). Children involved with this activity center took part in free-play activities related to a furniture exhibit in the Toledo Museum of Art, in contrast to my study, which involved researcher-led, collaborative, composition-making activities that prepared children to view one artwork in a museum setting.

Another activity area in the center was dedicated to the art of Andy Goldsworthy. Two-dimensional reproductions of his works in stone were hung on a wall above a table where varieties of stones were placed. The reproductions were used to inspire children's own
compositions with stones. Some stones were placed in a pattern that could be completed by children or simply used as a catalyst for the creation of their own designs.

The painting “The Country Gallant” (Danko-McGhee, 2009, p. 11) was used in another "art/play" activity area as inspiration for creative interaction. In it, three children are playing in a forest in autumn. A brook with a log across it has just been crossed by one of the boys in the scene. Pre-service students prepared an activity to complement the painting. They hung a reproduction of the painting on a wall and placed blue cellophane on the floor to simulate a river. A log was added to cross the river, and a basket of clothes similar to those in the painting was placed nearby. Children’s responses to the area included using a large wooden toy from another area in the center as a teeter-totter and a boat, and dressing up in the clothes to “sail down the stream” (p. 13).

Danko-McGhee’s study in the Toledo Museum of Art was similar to my study in its provision of collaborative, object-centered learning experiences for young children. Differences between the two studies were evidenced in the kinds of spaces used for previewing experiences, the number of children, families, and others involved, and the use or nonuse of dramatic play activities. Not all of Danko-McGhee’s previewing activities involved hands on art making experiences, and none of the activities planned for The Family Center were intended to prepare children for documented viewing experiences, unlike this study.

**Significant Components of the Previewing Experience - The Art Museum Environment**

My study took place in the Museum of Art at Brigham Young University because it was a professionally-designed environment suited to young children who are aesthetically oriented (Vecchi, 2004) and preparing to view an original artwork. Art museums have the potential to provide exceptional learning experiences for young children, who are already "enthusiastic
museum visitors" (Piscitelli and Anderson, 2000, p.3), despite the fact that many museums do not provide art making activities for children that prepare them to respond to artworks. As twenty-first century art museums become more audience-centered, as opposed to object-centered (Hennes, 2010), however, more of them may consider ways to involve children in the entire creative process of making and perceiving art.

If art museums were to provide young children with opportunities to explore materials and processes related to original artworks, they would foster children's constructivist nature, "defined as constructivist from the work of Piaget (1937/1954), where children construct their knowledge of the world by acting on the environment" (Swann, 2008, p.36). Art museums as socio-cultural environments would also support children and the "Reggio Emilia constructivist theory, now neo-Piagetian [which],….extend[s] the concept of knowledge [as] never [having] been verifiable through one's perception, but rather it gains clarity through negotiations with others" (p. 36). Art museums are positioned to provide children with high-quality, artistic learning experiences that allow them to create and perceive art within a community of peers, adult visitors, and guides, which support their constructivist nature.

**Exploration of materials**

Each previewing experience in my study began with children handling large shapes related to the sculptural artwork they prepared to view. They explored the qualities of the shapes, such as, their size, texture, weight, and composition by removing square and circle shapes from the base, discussing their characteristics, finding the shapes in a large poster, and creating arrangements with square and circle shapes. Exploring artistic materials is an important element of appropriate art making experiences for young children described in the National Visual Arts Standards, Content Standard #1, "Understanding and applying media, techniques and processes"
An example, of one art making experience described by Danko-McGhee (Danko-McGhee & Slutsky, 2007, p. 50) which addressed Content Standard #1, allowed children to explore different painting tools and paint on white paper. The procedure involved covering a long table with sheets of newspaper. Pieces of white paper and a painting or drawing tool were placed on the newspaper in front of each child. Children were instructed to listen for music to begin playing. When it did, they were allowed to paint or draw with the tool provided. When the music stopped they were asked to return the tool to its original place, pick up their papers and move wherever the teacher instructed them to and begin the process again. The experience was structured to encourage children to explore the expressive capabilities of painting and drawing tools, just as children exploring shapes in my study became familiar with their characteristics and possibilities.

**Collaboration**

After children explored large shapes in my study, they were invited to create collaborative compositions in response to open-ended design problems given by the Investigator, such as, "Can you make an underneath place?" "A hiding place?" "A doorway to someplace you want to go?" The Investigator chose collaborative problem solving methods to (1) create a sense of belonging in young children experiencing a new environment, adult guide, and activities, in a short visit to an art museum; (2) provide children with an artistic experience designed for the "Conceptual Age" (Pink, 2006); (3) "decentralize and enhance" (May, 2011, p. 34) the experience.

**Creating a sense of belonging**

In my study with shapes, children knew each other because they were in the same kindergarten class, but they did not know the Investigator, were not familiar with
Theater/Orientation room where the previewing experience took place, and had never experienced an activity like the one they participated in with large shapes. The Investigator felt a collaborative art making experience would help to create a sense of belonging within the group. In Griebling's (2011) article Discoveries from a Reggio -Inspired Classroom: Meeting Developmental Needs Through the Visual Arts, she said, "children have a need to belong. They need to know they are a significant member of their family and other social communities" (p. 8).

**An experience designed for the Conceptual Age**

The collaborative nature of my study was designed with Pink's (2006) new Conceptual Age values in mind, which are "design, story, symphony, empathy, play, and meaning" (p.87). The guided, collaborative design-based experience was intended to encourage children to express themselves as individuals contributing their best to something bigger and more exciting than they could produce on their own, characteristic of a symphony. The play-like collaborative experience with large shapes was designed to bring children together quickly to empathetically work together as a team. The Investigator expected that a story unique to each group would emerge, and that children who were discovering solutions to problems they enjoyed solving would find their experience meaningful.

**Decentralizing and enhancing art making experiences**

Collaborative art making experiences that help to create a sense of belonging among participants, and prepare them for the Conceptual Age, also decentralize and enhance (May, 2011, p. 34) learning processes, placing students and teachers, on equal ground “allowing for necessary dialogue and conversation… leading to innovative exploration of materials and concepts. In this situation, students can become active learners as opposed to passive participants, and teachers learn to strategically listen and watch for teachable moments” (p.34).
Placing students and teachers on equal ground does not mean that both parties come together with equal amounts of knowledge and experience, but rather, a healthy exchange of ideas can occur between them. In this way, teachers can scaffold children's efforts providing needed guidance and inspiration when they are out of ideas or lack motivation (Piscitelli & Weire, 2002). In this study, the Investigator had many opportunities to make suggestions and offer ideas that helped children discover solutions to design problems with shapes.

**Open-ended problem solving methods**

Open-ended problem solving methods were an important component of this study. They provided structure for children’s explorations of shapes, possibility for imaginative outcomes, and engaged the mind. Mulcahey (2009) explains that "open-ended" [art] activities does not mean that children should have free reign to do whatever they want" (p. 21). Rather, open-ended art activities should provide structure for creative thought and exploration. The Early Childhood Art Educator’s Issues Group definitions of appropriate practices for young children’s art experiences, states in their National Art Education Association Position Paper, "A child needs an organized materials-rich environment that invites discovery, interaction, sensory and kinesthetic exploration, wonder, inquiry and imagination" (2006, p. 1). The Investigator felt that open-ended problem solving techniques helped to accomplish these goals.

Hein, in 1991, also addressed the need to engage the mind as well as the hands in art making experiences. He said,

Most educators have accepted the idea that learners need to be active, that in order to participate in learning we need to engage the learner in doing something, in hands-on involvement, in participatory exhibits and programs. But, the more important point, I
believe, is the idea that the actions which we develop for our audience engage the mind as well as the hand (Hein, 1991, p. 4).

**Large shapes as artistic material**

Large shapes were chosen as the media for this thesis project for many reasons. First, they related to the large geometric shapes in the sculpture the children prepared to view. Second, they fostered collaborative play-like activity. Third, they encouraged large muscle movement important to the health and enjoyment of young children (Curtis, 2003). Fourth, they provided a connection to children’s past experiences with block-play (Hein, 1995). Finally, they created three-dimensional compositions that are exciting to young children. Danko-McGhee (2007, p. 49) expressed the following about three-dimensional art materials,

> It is important for young children to use three-dimensional materials as a "language."

Just as much can be communicated with three-dimensional materials as it is with drawing. In fact, these experiences, “allow them to convey concepts about the three dimensional world which are impossible or difficult for them to depict through drawing and painting” (Kolbe, 1997, p. 8).

**Significant Components of the Viewing Experience - Viewing a Large Sculpture / Inquiry and Game-like Discovery Methods**

The previewing experiences prepared children to respond to an outdoor sculpture made from large, geometric shapes. Anderson, Piscitelli, Weier, Everett, and Taylor (2002) in the study *Children’s Museum Experiences: Identifying Powerful Mediators of Learning*, said that “…kinesthetic experiences with large-scale sculptures were enjoyable, recalled in great detail and had a strong educational impact for children…” (p. 11). The study also said that children
“viewed their experiences with outdoor sculptures in the same way as their everyday experiences with out-door play equipment” (p. 11).

The viewing experiences of this study involved documenting children’s discovery of the outdoor sculpture they prepared to view, and allowing them to explore it physically (Vecchi, 2004) using convergent inquiry methods (Sternberg, 1989) and game-like searches for favorite shapes, the title, and handwritten name of the artist. The Investigator used convergent inquiry methods to call attention to specific characteristics of the artwork, which allowed her to examine whether or not the previewing experience made children aware of differences in size, weight, materials, composition, and placement of the sculpture compared with their own compositions.

Sternberg (1989) discusses the idea that a participatory viewing experience, in the form of a “game format can include treasure hunts in which specific objects and details are found, [and] exploration of concepts including elements and principles of design” (p. 164). The Investigator's intent to involve children in play-like discoveries of the physical features of the sculpture relied on the knowledge that kindergarten children are active learners who learn best if the experience is enjoyable. “The idea that learning can take place in a museum setting with well-planned, play-like participatory activities has its basis in Jean Piaget’s theory that children learn about their world through play” (p. 158).

Analysis of Study

This study was analyzed according to methods described by Patton (1990) in his book, *Qualitative Evaluation and Research Methods*. Patton's book provided comprehensive, straightforward information about conducting a qualitative research study ⁶ and how to make sense of it.

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⁶ Lane Fischer, from the Internal Review Board at Brigham Young University, determined this study to be qualitative, in June, 2010.
According to Patton, an analysis of a qualitative study like mine consists of three components (1) an illustration of observational data, which describes in detail what the experience entailed; (2) an analysis, which involves a description of emergent patterns evident in the data; (3) an interpretation of the analysis by the Investigator. A detailed discussion of Patton's methods will be addressed in the Methodology chapter of this thesis.

**Conclusion**

This Literature Review discussed in detail the three studies mentioned in the Introduction that parallel my study in their use of collaborative previewing experiences for young children that prepared them to respond to artworks in museum settings. It also discussed key components of the previewing and viewing experiences of my study, and a brief description of the analysis. Components of the previewing experience include (1) the art museum environment; (2) exploration of materials as an art making activity for young children; (3) collaboration; (4) open-ended problem solving techniques; (5) the use of large three-dimensional shapes as artistic material. Components of the viewing experience include the value of viewing large sculptures with children, and inquiry and game-like discovery methods used to help children respond to artworks.
Methodology

The Investigator reviewed three books describing design frameworks and methods appropriate to this study, which was determined as qualitative by Lane Fischer, a member of the Internal Review Board at Brigham Young University, in June, 2010. The three books reviewed were, *Qualitative Inquiry & Research Design* (Creswell, 2007), *Visualizing Research* (Gray & Malins, 2004), and *Qualitative Evaluation and Research Methods* (Patton, 1990). Of the three books mentioned, the Investigator felt Patton's was the most comprehensive. A qualitative research methodology was appropriate for this study because I was interested in a detailed description of the experiences and responses of the children who participated.

Qualitative studies, according to Patton, are an attempt to describe human experiences through "detailed, thick description [and]…direct quotations capturing people's personal perspectives and experiences" (Patton, 1990, p. 40). In a qualitative study "the researcher is the instrument" (p. 14) who measures the results of the study and is often involved in the study as described by Guba (1978) “… moving back and forth between the discovery mode and the verification mode like a "wave"….when the investigator is open to new inputs through more data and periods when the investigator is testing out hunches, ideas, and explanations" (Patton, p.266).

As the Investigator in this study, I had similar experiences to those described by Guba. At times I was absorbed in the experience as a participant watching events unfold i.e., when children were collaboratively solving design problems without my help. At other times, I was experimenting with a new intervention, such as changing an open-ended design problem from
one that invited children to make "an underneath place" to one that asked them to make "a hiding place."

A Basic Research Design

A basic research design, according to Patton, has seven components, which include, "purpose, focus of research, desired results, desired level of generalization, key assumptions, publication mode, and, standard for judging" (Patton, pp. 160-161).

Purpose

The first component, or purpose, of a basic research design is to acquire knowledge related to the inquiry, or hypothesis, of a study. One of the purposes of my study was to test the hypothesis that collaborative previewing experiences prepare young children to respond to artworks in the museum. The other purpose of my study was to document the responses of children to the experience. Patton said,

Advocates of methodological purity argue that…one cannot be testing predetermined hypotheses and still remain open to whatever emerges from open-ended, phenomenological observation. Yet, in practice, human reasoning is sufficiently complex and flexible [so] that it is possible to research predetermined questions and test hypotheses about certain aspects of a program while being quite open and naturalistic in pursuing other aspects of a program (Patton, 1990, p. 194).

As the designer and Investigator of my study, I found it necessary, as Patton discussed, to base the experiment of the study on a supposition, or hypothesis, to give it structure. Once the study was framed, I was positioned to discover what the design would produce, rather than look for predetermined outcomes. Research of this kind is emergent, open-ended, and inductive. It allows for patterns to emerge from data, rather than imposing predetermined standards on data.
before it is collected. The patterns that emerge from data, give it meaning, and reveal the findings of a study.

Focus of research

The second component of a basic research design, or focus of research, concerns "questions deemed important by one's discipline or personal intellectual interests" (Patton, 1990, p. 160). My study which was designed to prepare children to respond to an artwork and document their responses to the experience, addressed these questions: How will children respond to the shapes? Will children be able to prepare to respond to an artwork through collaborative compositional efforts in response to open-ended design problems? How will they work together to create collaborative compositions? What kinds of compositions will they create? How will they respond to the artwork? What responses to the artwork related to the previewing experience?

Desired results

The third component, or desired results, of basic research refer to contributions to theory. My study has the potential to shed light upon the effectiveness of a collaborative previewing experience to prepare young children to respond to an artwork in the museum. It collected large amounts of visual and verbal data that described the experiences of young children and an adult guide involved in a collaborative art making previewing and viewing experience, in an art museum.

Desired level of generalization

The fourth component of basic research, or desired level of generalization, refers to the ability of the study to effect knowledge over a broad spectrum of time and space. In relation to my study, the following questions relating to generalization might be asked: Is this study
adaptable to other museum settings? Can the study be adapted to prepare children to view other kinds of artworks? Is the study adaptable to other ages of children? Is the study documented well enough to reproduce it in another setting? Although it was a small sample, I feel that my study did obtain a desired level of generalization.

**Key assumptions**

The fifth component of basic research, or key assumptions, suggest that "the world is patterned; [and] those patterns are knowable and explainable" (Patton, 1990, p. 160). Patterns that emerge from the large amounts of data gathered in qualitative studies give meaning to the data. Discovering patterns in data is the process of analysis that determines what effect the intervention had on participants. Distinct patterns of behavior emerged from data collected from both groups of children who participated in my study.

The analysis process used in my study consisted of three components discussed by Patton (1990) (1) an illustration of observational data; (2) an analysis of the data; (3) an interpretation of the analysis. The first component, gave a description in narrative form of the experiences and dialogue between participants in the morning and afternoon sessions of the study, through digital photographs, written notes, and transcriptions of verbal data. The purpose of the illustration was to give readers an inside view of the study. The second component identified patterns that emerged from the illustrated data, which were documented through photographs, written notes, and transcriptions of verbal data which revealed the findings of the study. Finally, the third component was an interpretation of the analysis by the Investigator.

**Publication mode**

The sixth component of a basic research design, or publication mode, refers to the "major…scholarly journals in one's discipline, [or] scholarly books" (Patton, 1990, p. 160). If my
study were to be published, it would appear in a scholarly journal addressing issues in my field, such as, *Curator, Journal of Museum Education, Museum, Art Education, Studies in Art Education, Education through Art, International Art in Early Childhood Research Journal.*

**Standard for judging**

The seventh component of basic research, or standard for judging, is concerned with the "rigors of research…and verifiability of theory" (Patton, 1990, p. 160). In other words, is the study reliable? Did it gather "high quality data that [was] carefully analyzed" (p. 461)? Was the researcher qualified? Did the researcher have a "fundamental appreciation of naturalistic inquiry" (p. 461)?

**High quality data**

According to Patton (1990), high quality data is determined by three criteria; “Validity, reliability, and triangulation” (p. 461). The three criteria ensure that data collected is an accurate representation of what happened. For example: Was data gathered by reliable methods? Were three types of data collected?

In my study, the responses of both groups of participants i.e., five children from the morning kindergarten class, and five children from the afternoon kindergarten class were collected by reliable methods and sources. The data includes video recordings of the morning and afternoon sessions recorded by Rebecca Summers and Brooke Parker. Rebecca was referred to the Investigator by the Chair of the Theater and Media Arts Department at BYU, and Brooke Parker, is Rebecca's friend. Rebecca and Brooke submitted resumes to the Internal Review Board, BYU, and both were approved by the board to film both sessions. Video recordings were made into DVD’s for the Investigator to review by Rebecca Summers. Data also include a third source in the form of hand written notes recorded by the Investigator after the morning and
afternoon sessions. Verbal data was transcribed into a written format by Rebecca Summers. The Investigator carefully reviewed the transcriptions by matching them with video footage transferred to DVD's of the morning and afternoon sessions. Digital photographs used in the thesis document were extracted from video footage by Rebecca Summers.

**Qualifications of the researcher**

After a long discussion with Lane Fischer, an Internal Review Board member at BYU, concerning the structure of the study and my intentions for it, he determined that I was competent to carry out the study. As the Investigator of the study, I felt secure with its explorative and emergent nature, and its purposes to test the hypothesis that collaborative previewing experiences prepare young children to respond to art in the museum, and document their responses to the experience.

**The Participants**

Two groups of five, five and six-year-old children were involved in my study. Lane Fischer from the Internal Review Board at BYU determined that ten children in two groups of five would make an adequate sample for the study. Children were recruited from the Child and Family Studies Laboratory at BYU because they could be easily escorted from the school to the MOA. Also, it wouldn't be difficult for parents to pick up their children at the museum, rather than the school on the day of the study. Five and six-year-old children were chosen as participants in this study because Anne Ure, director of the Child and Family Studies Laboratory at BYU, determined they were of an appropriate age to take part in the study. The Investigator felt five and six-year-olds were young enough to enjoy handling large shapes and exploring a new collaborative activity with them, and were old enough to handle a relatively new situation.

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7 Internal Review Board member, BYU.
with a degree of confidence. Also, the Investigator had given tours to five and six-year-old children in the MOA previous to this study, and found them to be responsive art museum visitors.

**Recruitment of participants**

Children were recruited for my study from the morning and afternoon kindergarten classes at the Child and Family Studies Laboratory at BYU. An Internal Review Board consent letter, which included a detailed description of the study written by the Investigator, was sent by the director of the Child and Family Studies Laboratory to parents of all children in both morning and afternoon kindergarten classes. Parents who were interested in having their children participate in the study signed the letters, which were returned to the director of the school and then given to the Investigator.

**Morning group of kindergartners**

The director of the Child and Family Studies Laboratory discussed with the Investigator the names of children in the morning group whose parents had agreed to let them participate in my study to determine who would be good candidates. After a phone call from one of the boy's mothers in the morning group, the Investigator agreed to let her son and his friend participate in the morning session with three other children suggested by the director. The Investigator sent emails to parents of children in the morning group confirming their acceptance into the study.

**Afternoon group of kindergartners**

The director of the Child and Family Studies Laboratory also discussed with the Investigator the names of children in the afternoon group, whose parents had consented to their child’s participation in my study, she felt would be good candidates. The Investigator sent emails to the parents of those children suggested by the director to confirm their place in the study. The
consent letters were returned to the Internal Review Board, approximately six months after the completion of the study to confirm they had been signed by parents of children in the study. They were later returned to the Investigator.

Confidentiality of participants

As dictated by Internal Review Board standards, children's real names were not used in the study. Children were referred to as Girl 1, 2, or 3, or Boy 1, and Boy 2, etc. Children were given name tags to wear during the study so the Investigator would be able to refer to them by their real names, which were made illegible in digital photographs made from video footage of the study, and used in the thesis document. All video footage that was made into DVD's of the morning and afternoon sessions will be destroyed after the Investigator graduates, per Internal Review Board requirements.

Escorting Children to the MOA

On Friday, an early dismissal day, October 22, 2010, the Investigator escorted five children from the Child and Family Studies Laboratory's morning and afternoon kindergarten classes, when they were dismissed from class at 10:15 and 2:15 respectively, to the MOA. In the Gathering Area of the MOA, an Orientation to the experience with shapes and spaces was given by the Investigator. The Investigator introduced the children to the two cinematographers, Rebecca Summers and Brooke Parker, and invited children to look for shapes in the room. Due to time restraints and the narrow scope of the study which was limited to ten shapes found in the artwork the children prepared to view, she simply explained that all shapes are surrounded by space. The Investigator was fitted with a lapel microphone, and the cinematographers, Investigator, and children entered the Theater/ Orientation room adjacent to the Gathering Area of the MOA to begin the previewing experience.
The Previewing Environment/The Theater/Orientation Room

The Theater/Orientation room of the MOA at the time of the study was spacious, uncluttered, and complementary in design and color to the shapes, and carpeted; everything the Investigator wanted for children's explorations of large shapes in a museum setting. The room's colors were a muted, warm taupe, bathed in soft light from canned ceiling lights. Wooden benches with royal blue cushions lined the walls.

The shapes

Ten large shapes, one-third the size of those in the sculpture children prepared to view were standing on a 4” plexi-glass base on the floor in the center of the room. The Investigator designed, Mod-Podged and painted the shapes, which were cut with precision by Andrew Orme, an engineering student at BYU. They were made from scrap pieces of dense foam left in one of the shop rooms on campus. The Investigator chose to paint the shapes in subtle shades of red and red-orange for several reasons (1) to compliment the colors in the room; (2) form a harmonious unit; (3) call attention to the shapes, rather than their colors; (4) be attractive to children. The Investigator chose to place the shapes on a plexi-glass base to call attention to the shapes.

Other additions to the theater/orientation room

The Investigator also had a poster of Paris made that was hung from an armoire used as an electronics cabinet in the Theater/Orientation room. The poster was made from an internet picture of a collage painting of Paris. The Investigator had the poster made to represent all ten shapes in the sculpture and place them in a context. She also chose the painting because it was interesting and complimented the colors in the room.

On either side of the poster were two stand-up images of the Eiffel tower, and a whimsical Nauvoo temple. The images were three-dimensional prints made from original
drawings by BYU student, Andrew Beck. The Investigator intended for the images to represent a three-dimensional context for the shapes.

**The Outdoor Sculpture**

The sculpture *Koda* was chosen because it lent itself to a collaborative and constructive previewing experience appropriate for both young boys and girls who enjoy large movement and creating three-dimensional objects from large shapes. The Investigator also considered *Koda* an appropriate artwork for young children to respond to because it was outdoors and could be associated with outdoor playground equipment, which could create interest for young children.

**Conclusion**

This methodology section describes the nature of this research study, the methods used to conduct it, and the philosophical basis behind the methods used. According to Patton (1990), this study uses a qualitative, inductive, research design. The purposes of the study are defined as testing the hypothesis that collaborative previewing experiences prepare young children to respond to artworks, and documenting the responses of children to the experience. Methods used to conduct this study involved data collection, data confidentiality, data transfer, recruitment of participants, confidentiality of participants, the prepared environment, and the choice of the artwork upon which the study was based.
Observational Data Illustrated/ Morning Previewing Experience

The morning previewing experience began after a brief orientation in the gathering area of the MOA. In the orientation, three girls and two boys from BYU's Child and Family Studies Laboratory morning kindergarten class were introduced to two cinematographers (Brooke Parker and Rebecca Summers) who filmed the session. Children were also given a short introduction to the experience with shapes and spaces, and were invited to look for shapes in the gathering area before entering the Orientation/Theater room where the previewing experience took place.

Following the orientation, the Investigator led the children, who, for the sake of privacy, will be referred to as Girl 1, Girl 2, Girl 3, Boy 1, and Boy 2, into the previewing room. Immediately upon entering the room, the children focused their attention on ten large red shapes, one third the size of those in the Koda sculpture, that were standing on a clear plexi-glass base. The colorful six-foot- high poster of a painting of Paris, titled Shapes and Spaces in bold black letters, and two, three-foot- high stand- up images of a hand drawn Eiffel tower and Nauvoo temple seemed to go unnoticed.

I asked the children to sit on the floor in front of the shapes when one of the boys said, "Those are big blocks!" I agreed, and asked them what the shapes were like. Rather than answer the question, boy 1 said (as he pointed to the large square shape with a curvy side and a little square opening), "What about that one (Figure 4)?"
"There's A Square."

Investigator: "Yeah, what about that one?"

Girl 1: "There's a square."

Boy 1: "It has a shape (making a triangle with fingers)."

I asked what they might call the big square shape and Girl 1 said "A square," and Boy 1 said, "That's a triangle (pointing to the pyramid shape)!" I pointed to the little square opening in the big square shape again, and asked what it was like and Boy 1 said, "A cockadoodle." After which, I asked about a half-dome shape on top of a pillar, and when I attempted to remove it (the shapes had been Mod Podged and painted and were sticky from sitting over night) some shapes tumbled into Boy 1's lap. Girl 1 and 2 covered their mouths with their hands, Girl 3looked surprised, Boy 2 looked unchanged, and Boy 1 said, "I can lift this (Figure 5)!"
Taking All Square Shapes Off

After the children explored the shapes and their textures I showed them a pillar shape with a square end and asked if they could find all the shapes with squares and take them off the base. Soon, all square shapes were off the base. The children removed some, and I removed some that they had discovered. Girl 1 pointed to the big curvy square, Boy 1 stood up and took a tall rectangular shape, Girl 3 pointed to another pillar shape, Boy 2 walked around to a pyramid shape, and I picked up a large wedge shape, showed them the square end, and asked what it looked like. Girl 1 and 3 said it looked like a triangle and, after a while, Boy 1 said, "A roof!"

Finding the "Roof Shape"

I asked if they would like to try and find the "roof shape" (Figure 6) in the poster of Paris, and explained that they could touch the poster. As Boy 1 (carrying a small cylinder) quickly stood up and headed to the poster, he walked right through the shapes and knocked them all over. I told him it was OK, and he acted like it wasn't an issue. The other four children walked around the shapes to get to the poster. No one was able to find the roof shape of Notre Dame, but they were all very excited to discover the pyramid-shaped-entrance to the Louvre (Figure 7). It was
the only shape in the poster they could easily identify. While Girl 1 was telling a story about the pyramid shape that was lying on the floor near the poster, Boy 1 was touching it with a small cylinder shape (Figure 8). After pointing out the roof of Notre Dame, I walked back to the base and asked the children if they could remove the last two square shapes, which they did. Then I asked them what kinds of shapes were left while showing them the end of a cylinder. Several children chimed in, "Circle!"

Figure 6. Brooke Parker, Looking for the "Roof Shape," 2010. Digital photography.

Figure 7. Brooke Parker, The Pyramid Shape, 2010. Digital photography.
Next, I said, "Here's the problem," to which an unidentified child said, "What?" I explained that I wanted them to make an arrangement out of the circle shapes, and that they all needed to fit on the base. Immediately, they got to work. Girl 1 and Boy 1 tried putting smaller cylinders on top of bigger ones, Boy 2 put a rectangle shape on the base, which I gently removed explaining that it couldn't be there because it wasn't a circle shape, and Boy 1 (in an intake of breath, spreading his arms wide) said "Whoa!" as he successfully balanced the dome shape on top of two cylinders (Figure 9). Girl 1 added the last circle shape (a skinny cylinder) to the arrangement, and Girl 3 pointed out an in-between space in the arrangement—after I asked everyone if they could find one.
Replacing Circle Shapes With Square Shapes/Heavy Shapes

The next exercise I suggested was to take all of the circle shapes off the base and put all the square ones back on. They enjoyed handling the shapes and quickly began to dismantle the previous arrangement and carry the square shapes back to the base. As they did, they became interested in how heavy or not heavy they were.

Girl 2 (holding large cylinder): "This is not even heavy (Figure 10)."

Boy 1: (picking up the square wall) "This one is heavy."

Investigator to Girl 2: "No it's not heavy. That's why I made them out of foam, so they wouldn't be heavy."

Boy 1: "Uh, this one's heavy (Figure 11)."

Investigator: "Is that one heavy? Do you need help?" (Boy 2 reaches out to stabilize the square wall in Boy 1’s hand.)

Boy 1: "It's made out of hard foam."

Investigator: "It's made—this is a different kind of foam, it is heavier."

Boy 1: (lifting a long rectangular one) "This one's not."
Investigator: "That one's not? OK."

Girl 1: (holding dome) "This one isn't either!"

"Now We Have to Make One Out Of These!?!"

At this point I called their attention to the fact that there was one square shape that wasn't on the base yet. Boy 1 picked it up and then one of the girls said,
Girl*: "Now we have to make one with these (referring to the square shapes)?"

Investigator: "Yep. Now we have to make an arrangement out of square shapes."

(Boy 2 jumps up and down excitedly.)

Girl 2 (holding one end of the square wall): "Hmm, Ah-ha (Figure 12)!!"

(Girl 2 and 3 move the square wall to a different side of the arrangement.)

Figure 12. Rebecca Summers, "Ah-ha!" 2010. Digital photography.

Shortly after Girl 2 and 3 moved the square wall around to the other side, the arrangement of square shapes came to completion. I asked the children if they could point out an in between space in the arrangement and Girl 1 immediately did (Figure 13).
In Between Space Turns Into A Hiding Place

After the in between space was identified, I asked if it was like a hiding place. Boy 1 said, "Yes!" and the following happened,

(Girl 3 begins moving square wall.)

Investigator: "Here, add the circles too…"

Girl 1: "K."

Girl 1: "Hmm let's see..."

(Boy 1 jumps up and down and makes some kind of ahh/roar.)

(Girl 3 is still working with the square wall while Girl 2 has grabbed a small cylinder and jumps up and down with it a couple of times. Boy 2 has placed the pyramid on top of a large cylinder and is holding it.)

Girl 1: "Teacher, look at this space right here! (She motions to the space in between two tall pieces under the roof/wedge.) And I made a hiding space!"
"A Nice Hiding Spot"

At this point the children became very pleased with their hiding place and began to refer to it as "nice".

Boy 1: "A nice hiding spot (Figure 14)."

Girl 1: "This looks nice. This looks kind of nice doesn't it (going over to dome shape)?

(Girl 2 and Girl 3 are working and talking together.)

(Girl 3 stands small cylinder next to dome shape.)

Girl 1(talking to Girl 3 who places a small cylinder standing up next to dome shape):

"That looks good. Yeah, let's just put this [dome shape] on top (Figure 15)."

Figure 14. Rebecca Summers, "A Nice Hiding Spot!" 2010. Digital photography.
Making a Change and "An Underneath Place"

The children stepped back to look at their arrangement of square shapes and I asked them if there was a change they would like to make. Boy 1 and 2 said they wanted to make a change, and everyone joined in. Then I posed another problem. This time I asked them how they could make "an underneath place" which resulted in their realization that "high shapes" would help them create the space. "High shapes" became important to them.

Girl 2: "I think that we sh–I think that we move everything high."

Girl 2 (?): "Like, we can like do this (stands two pillars on end next to one another)…"

Girl 2: "High shapes."

(Boy 2 tries to put another "high shape" on top of a "high shape." Girl 2 takes it off and sets the high shape next to the rest of them.)

Girl 1 (who favored the dome shape the entire morning): "Is this a high shape?"

Investigator: "What do you think?"

Girl 1: "It's like a moon."
Girl 1: "Look at it (walks to base and sets moon/dome on a high shape)."

Investigator: "Ok. Where's the "underneath place"?"

Boy 1: "I'm not sure."

Girl 1 (?): "We don't know."

Investigator: "Hmmm."

(Boy 1 pointing to square wall that's underneath a couple of high shapes, lying on the base.) "Right here."

Investigator: "What could we do with the curvy square?"

Girl 2: "Maybe we could put that standing up, everything standing up (Figure 16)."

Figure 16. Rebecca Summers, "Maybe We Could Put that Standing Up." 2010. Digital photography.

Finding a Shape to Go On Top Of the "High Shapes"

The children understood that they needed to make everything high, but needed some help to decide what should go on top of the "high shapes" to make an "underneath place." I asked if something needed to go on the top to make an "underneath place."

Girl 1 said, "Umm...probably...Hey! I see one (points at her favorite shape-the dome)!"
Investigator: "Could something go on top of these shapes?"

Girl1: "Yeah it could." (Boy 2 is putting a high shape on top of another high shape.)

Girl 3: "The–This (pointing at curvy square)!

Investigator: "Yeah! Try that. [Name] Let's try that."

Girl 2: "Yeah, let's try it.

Girl 1: "And let's try this too (wants to put dome shape on top)!"

Investigator: "OK, just a minute… you can put that on in a minute."

Girl 2: "And this (moving a high shape off of the curvy square)."

Investigator: "Ok maybe–"

Girl 2 (moving big curvy square with Girl 3): "Me an [name of Girl 3] are gonna do this (Figure 17)!

Figure 17. Rebecca Summers, "We're Gonna Do This!" 2010. Digital photography.

**Balancing the Curvy Square on Top**

Once the girls placed the big curvy square on top of the "high shapes" to make "an underneath place" they realized they needed to find a way to balance it. Girl 1 said, "Hold it for a
while," Girl 2 said, "We need more stuff," Boy 2 tried to stick a small cylinder standing up between the pillar under a corner of the curvy square, and Girl 1 tried doing the same thing under another corner. In the process, Boy 1 said, "They have different colors (the shapes were various subtle shades of deep red and orange)!" Then Boy 2 successfully worked his cylinder under the corner of the curvy square and the arrangement was stabilized (Figure 18).

![Image](image_url)


**Adding More Shapes to "Underneath Place" Arrangement**

The arrangement was successfully stabilized and looked similar to the arrangement made when the curvy square was first placed on top of the high shapes. Next, I wanted the children to start putting the remaining shapes on top so that all of the shapes would be used in the composition. As they attempted to place things on top the structure wobbled and fell apart.

Boy 1: "Wait, it can't take– (moves out cylinder in the process knocking the whole thing over)…"

Investigator and Girl 1: "Whoa!"

Investigator: "Hey, let's try it again. Let's try it again. And see if we can get it back."
"All Tall Things"

The children began again to recreate the arrangement and "all tall things" became the guiding phrase for its reconstruction.

Girl 2: "I suggest we put all tall things on…"

Investigator: "The bottom?"

Girl 2: "We put all the tall things on first then we put the top on."

Child*: "All tall things" (Figure 19).

Girl 2 (?): "Uh huh, all tall things."

(Girl 1 has set the pyramid on top of a tall cylinder.)

Investigator: "OK, how are we going to get that (curvy square) on top of the tall shapes?"
The Arrangement Topples and is Rebuilt

In their attempt to balance the curvy square on top of the tall shapes the whole thing collapsed again. I suggested we try again and everyone did. The arrangement was quickly rebuilt (Figure 20).
Changes and Chimneys

I asked if there was a change anyone wanted to make and Boy 1 and Girl 1 were the most demonstrative about making one. Boy 1's change involved placing a cylinder on top of the curvy square to look like "a chimney" (which quickly became a popular thing to do), and Girl 1's change involved removing the pyramid shape from the top of the curvy square. When she did, the small square window was exposed and Boy 1 and Girl 3 really enjoyed placing cylinders through it (Figure 21).

![Image](image.jpg)

Figure 21. Rebecca Summers, *The "Chiminy,"* 2010. Digital photography.

Experimenting With the Heavy Roof Shape on Top

When the "chiminy" arranging ran its course, attention turned to the large roof/wedge shape, which was sitting on the base. When Boy 2 tried to pick it up (as if he wanted to place it on top of the curvy square), Boy 1 said, "No, that would just be way too heavy," Girl 1 said, "Yeah, it will be way too heavy on this," and Investigator said, "Well, maybe you should try…." Girl 1 decided to try. Taking a deep breath, she began walking determinedly toward the wedge shape.
I suggested that maybe we should make room on top of the curvy square for the shape, and she responded, "Yeah, make really a lot of room." In the meantime, Boy 1 was already trying to lift the wedge shape as he made struggling "arrgh" noises.

(Boy 1 is still making lifting noises.)

Investigator (to Boy 1): "Do you need help with that?"

Girl 1: "I can help."

Investigator: (shaking the structure back and forth a little) "It's pretty wobbly isn't it. We need to make this a little more stable, maybe…"

(Boy 1 and Girl 1 set roof/wedge on top. Girl 1 is kind of pressing down on one side, the whole roof is tilting.)

Investigator: "What's that gonna do?"

Girl 1* "It's balancing (Figure 22)!" (The shapes were still a little bit sticky so the wedge stuck precariously to the curvy square.)

Boy 1 and Girl 1: "Yeah!" (Talking all at once.)

Girl 3: "Be careful. Be so careful."

Girl 1: "Does everybody like it?"

Investigator: "Want anything inside?"

Children: "Yeah (Figure 23)!"
Taking a Walk around the Sculpture and Naming It

Despite the fact that Girl 1 was asking everyone if they liked the arrangement, I asked them to take a walk around it. They were, however, more concerned with the arrangement's stability. As they were walking around it, an unidentified child said, "What if it falls down?"

While I was responding, and asking what they would like to name it, another Child said, "It's not falling down!" Then Boy 1 stepped up to the sculpture and said (affectionately): "The Ho-man."
Girl 1 called it: "Um…a studio." When I asked what it looked like, Girl 1 said, "Kinda like a house," Boy 2 said, "Kinda like an old house," Boy 1 said (while gesturing with his hands), "…a um, a rangly house," And Girl 2 said, "Maybe a block house."

**One More Problem-Making a Doorway**

Although everyone had already solved several open-ended design problems I decided to pose one more. The children immediately began making "whoa" noises as they dismantled everything. I asked if they could make a doorway to someplace they wanted to go.

(Talking all at once, "Oh yeah, let's make a doorway!")

Girl 1: "I know how to make a doorway."

Boy 1: "Lemme do this!"

Girl 1: "I have a doorway."

(Boy 1 is setting shapes up on the carpet.)

Boy 1: "We could make a doorway on this."

Investigator: "Yep."

Girl 1: "Cuz I have one. I have a doorway."

(While children were making a doorway, Girl 2 sits down on a bench to watch.)

Then I asked, "What about "a doorway to the stars?" And Boy 1 quickly responded, "And it's closed." I said, "Uh-oh. Who can open it?" And he said, "Open. Closed." (He demonstrated how it opened and closed.) Girl 1 wanted to "put a roof" on top of the door, and after she did, Boy 1 said, "It's still locked." I asked what was on the other side of the door that was so important that we had to lock everyone out. He said something about "fun stuff-"

Investigator: "Perfect, so all the fun stuff is behind the door?"

Boy 1: "Yeah. And now we'll open it since they're all gone (Figure 24)."
Preparing to Go Outside to View the Sculpture “Koda”

At this point I told the children we were going to go outside to find an artwork made out similar shapes. I explained that the artwork was a sculpture made by the artist Ray Jonas. I asked them to choose a favorite shape (to remember; not to take outside) and to try to find it on the sculpture outside. I also explained that we could not touch the artwork.
Observational Data Illustrated/Morning Viewing Experience

We headed outside through the foyer of the museum and outside to the outdoor sculpture garden. While walking I asked the children to look for shapes. They identified a half-dome shape on a garbage container, a cylinder on a stair rail, a rectangle on the table in the sculpture named *Sleepwalker*, and a large cylinder shape of a tree trunk. As soon as we were outside of the MOA the carillon bells were ringing. They created a sense of excitement as we headed over hills and through trees to discover the sculpture. Boy 1 discovered the sculpture first.

Discovering the Sculpture

Boy 1: "I found one (Figure 25)!

Investigator: "Oh."

Kids yelling: "I found one!"

Investigator: "…. Look at that sculpture! Does that look like the shapes we've been working with?"

Kids: "Yeah!"

Girl 2: "I hear bells!"

Boy 1: "Teacher! Come over here and look!"

Investigator: "Don't touch, don't touch."

Girl 1: "Look it's a sculpture!"

Girl 1: "Look at that (pointing to the half moon shape)!" "Look at that (Figure 26)!"
The Half-Moon Shape Looks Like It's Falling Off

Girl 1 was so excited to show me the dome shape she found on the sculpture, but when I asked the group to gather around it and asked them, "What does it look like it's doing?" she said, "Nothin’.”

Investigator: "No! Look from here, it does look like it's doing something. It looks like it's going to—"
(Kids say something like jump down.)

Investigator: "Yeah. I wonder why the artist did that. I wonder why he made it look like it was going to fall off. Do you ever feel like you're going to fall off of something?"

Girl 1: "Umm one time I was on the roof collecting sticks for the fire truck, I mean for the fire, and and I was afraid to jump off."

Finding the Curvy Square

The children were getting bored with the falling off story so I asked them to find the curvy square.

Investigator: "… do you know where the curvy square is with the little window?"

Investigator: "Can anybody find the big, the big curvy square with the little window—Without touching the artwork?"

Boy 1: "I FOUND IT!"

Investigator: "Yeah, there it is! What do you see through there?"

Kids: "The trees (Figure 27)!"

Figure 27. Rebecca Summers, Looking Through the Little Window, 2010. Digital photography.
Questions

After discovering the trees through the little square window, I said I had another important question for them to answer and many of the children started jumping off of the base. I asked, "How did the artist make that curvy square kind of flat on the top (trying to get them to think how he made it level)?" They never really understood the question, so I asked them other questions.

"Why do you think the artist made an artwork that can be outside?"

Girl 1: "I'm not sure. Maybe so they can look, so they don't have to go inside and look."

Investigator: "What happens when the rain comes on it, does it melt?"

Kids: "No."

What is it made of?

Investigator: "No? Why? What's it made out of- do you think?"

Girl 1: "Rock."

Investigator: "Don't touch it, don't touch it."

Boy 1: "It's made out of rock."

Boy 2: "Or wood."

Girl 1: "I know. Metal."

I confirmed that it was made out of metal and asked what happens to metal when it gets wet. Girl 1 said, "It doesn't move." I showed them a metal ring on my purse and asked if the sculpture looked like the ring. The children responded, "Mmm-mm no." I asked again, "What happened to it?" And Boy 1 said, unenthusiastically, "Got rusty."

A few more questions

Investigator: "Yeah! It got rusty. Did the artist care?"
Boy 1: "No."

Investigator: "No, he doesn't care. He kinda likes it like this doesn't he?"

Kids: "Yeah, he does."

Investigator: "And if the wind blows, is it gonna blow it down?"

Kids: "Noo."

Girl 1: "I like walkin' around up here (Figure 28)."

Girl 1: "Watch this (jumps off of sculpture base)."

Figure 28. Brooke Parker, "I like Walkin' Around Up Here." 2010. Digital photography.

**Finding the Front of the Sculpture**

Despite the fact that the children's interest was waning, I asked them to find the front of the sculpture. I told them there was a 'square plaque' on the front which didn't seem to help. The exercise turned into a guessing game. I finally showed them the front with the plaque and they all gathered around to see it (Figure 29).

Investigator: "Look at this, right here, it says Raymond J. Jonas, *Koda.*"

Girl 2: "SO this is the front!"
Investigator: "This is the front…. Do you know what 'Koda' means?"

Kids: "No."

Investigator: "That's part of part of… a musical composition."

(Kids jumping off the base yelling.)

Investigator: "…. Do you have a name you'd like to name this?"

Boy 1: The "Co–Dee."

Investigator: "The "Kody. OK (smiling)!"

Girl 1: I know- "The Art."

Naming the Sculpture.

Everyone is getting tired…

Heading Back to the Orientation Room

As we headed back to the Orientation room (the same way we came) I asked the boys to hold hands and the girls to do the same. First, the boys hugged one another (Figure 30), and then they had the following conversation,

Boy 1 (holding boy 2's hand): "Look at them."
Boy 2: "I have only one arm! One arm, one arm. I'm a treasure I have one arm!"

Boy 1: "Treasure one arm...Ha! That's a hand." (Walking)

In the Orientation Room

Once back in the Orientation Room, I asked the children what part of the experience they enjoyed most.

(Girl 3 points to something - possibly the shapes.)

Girl 3 or 2: "Building."

Investigator: "Right, right. So do you have anything at home that you could build out of like those shapes?"

Boy 1: "Blocks."

Drinks, the Electronic Media Artwork, and Rides Home

We had about fifteen more minutes before the children would be picked up by their parents, so I suggested we all get a drink and head downstairs to play with an electronic media artwork: Healing 1. They enjoyed running, jumping, sliding and tumbling on it and then I took them to meet their parents.
Analysis of Illustrated Data/Morning Previewing Experience

Two distinct patterns of behavior emerged in the morning previewing session. First, children’s desire to physically interact with shapes, and second, their enjoyment in creating collaborative compositions with shapes as solutions to open-ended design problems given by the Investigator.

A Desire to Physically Interact with Shapes

From the moment children entered the previewing room they were attracted to the shapes and wanted to handle them. When they sat down in front of the shapes and I asked what they were like, Boy 1 responded, "What about that one (pointing to the big curvy square wall)?" He did not respond to my question; he was interested in a big shape. After saying a few words about it, I tried to take the dome shape off of a pillar and the pillar tipped over into Boy 1's lap along with a small cylinder. Delighted, he held up the cylinder and said, "I can lift this!" He was excited to discover that even though they were "big blocks" he could handle them easily.

After the shapes tumbled into Boy 1's lap, I invited everyone to touch the shapes to see what they were like. They were all excited to handle them (Figure 31). While handling them, one child discovered their texture and said, "They're kinda like bumpy."
Finding the roof shape and alone with the shapes

When Boy 1 discovered that the big wedge shape looked like a roof, he was excited to find it in the poster, and while carrying the cylinder shape that had fallen into his lap, he quickly walked through the shapes (on the base) knocking them all over. Hardly noticing what he had done, he went right to the poster excited to touch it with his cylinder in search of the special shape.

While Boy 1 was touching the pyramid shape in the poster with his cylinder, and three other children were discussing the pyramid shape that was sitting on the floor next to the poster, Girl 2 had found time alone with two shapes on the base. Joyfully and secretly she placed the dome on top of a big cylinder without anyone but herself and one cinematographer knowing (Figure 32). She found the shapes attractive- so much so that she wanted to play with them by herself.
Balancing circle shapes

After pointing out the roof shape of Notre Dame (because the children weren't able to; the roof shape was not clearly defined), we all returned to the base to make the circle arrangement. Boy 1 was interested in balancing shapes and when he successfully balanced the dome on top of a skinny cylinder that was on top of fat cylinder, he took a deep breath, spread his arms wide and said, "Whoa!" When the circle arrangement was complete and needed to be dismantled, he removed the two shapes he had added.

"This is not even heavy."

Removing the circle shapes to make the square arrangement was not a chore for the children. They became interested in holding the shapes to determine which ones were heavy and which ones were not. Boy 2 enjoyed holding a large cylinder in his lap and discovering that it wasn't heavy (Figure 33).
Handling the pyramid and roof shapes

As the square arrangement was progressing, Boy 1 showed great interest in the pyramid shape that was isolated on top of a tall shape. He stood back and stared at it in perfect concentration for a long time. Then he affectionately touched it, saying quietly, while looking at me, "Pyramid (Figure 34)."
Girl 1, who had managed to balance the large, heavy roof shape on top of a tall rectangular shape in the arrangement, said with pride and awe: "I'm holdin' it on balance!"

**The dome shape**

Girl 1 became particularly attached to the dome shape throughout the morning session. When the children removed the circle shapes from the base and became interested in heavy or not heavy shapes, she said (holding the dome) "This one isn't heavy either!" When the square arrangement turned into a hiding place, she made the last addition to the arrangement by placing the dome shape on top of a cylinder, saying, "That looks good. Yeah, let's just put this (the dome shape) on top."

When everyone was trying to make an underneath place with high shapes, Girl 1 (holding the dome) asked, "Is this a high shape….And let's try this too!" When the arrangement took shape, she wanted to stabilize it with the dome shape under a corner. She placed it, Boy 2 removed it, and she picked it up again, saying, "No, just let me do this. Cuz it will help. It will really help." Finally, when everyone picked a favorite shape to look for outside, she picked the dome shape and was very excited to find it on the sculpture.

**The chimney experiment**

Girl 3 became intrigued with an unusual experiment with a tall skinny cylinder as a chimney. As Boy 1 was making a chimney, she placed a shorter, skinny cylinder under the window through which he was placing his "chiminy." Then, when he removed his chimney, she placed her tall thin cylinder through the window to touch the cylinder she had placed below (Figure 35). She enjoyed experimenting and problem solving while handling concrete objects, which was a common theme throughout the morning.
Boy 2 showed interest in the large curvy square top of the "Underneath Place" arrangement. He liked holding it himself, and experimenting with its' supports. After the arrangement's first collapse, he picked up the curvy square by himself and attempted to place it on top of the tall shapes. When I helped him place it, he seemed as though he would have rather struggled to do it alone. Once the top shape was in place again, he moved a tall pillar under one of its supporting corners to stabilize it. When the arrangement collapsed a second time, he helped to rebuild it by placing the tall pillar under a corner again, as Girl 1 placed the dome under another corner. Then, just as the new arrangement was stabilizing itself, he quietly and gently pulled the tall pillar out from under the corner, and the whole thing started to tilt, but, amazingly, did not collapse.

As other children started to place small shapes on the top of the arrangement to complete it, Boy 2 placed the tall pillar under a corner of the curvy square again. After all the small shapes
were added, he precariously added one last shape to a supporting corner- a small cylinder that he placed on top of the dome shape which had been added to the top of a pillar (Figure 36)!

Figure 36. Rebecca Summers, *One Last Shape*, 2010. Digital photography.

**Removing shapes and starting again**

The morning session demonstrated the children’s strong desire to handle the shapes continually. After they had identified square shapes, tried to find a "roof shape" in the poster, removed all square shapes from the base, made a circle arrangement, removed all circle shapes, made a square arrangement, "a hiding place," three "underneath places," and had walked around their sculpture and named it, they were still excited to remove every shape from the base one more time to create "a doorway (Figure 37)."
Collaboratively Solving Guided Open-ended Design Problems

Every problem posed to the children in the morning previewing session was met with enthusiasm, both individual and collaborative. Identifying square and circle shapes, finding a roof shape in the poster of Paris, and other personal attractions to shapes were largely individual performances. However, when they were asked and guided to make "a hiding place" and "an underneath place," they demonstrated and enjoyed a significant collaborative effort that produced creative and pleasing solutions.

"A hiding place"

Most significant about the "hiding place" arrangement was the enjoyment, ease and rapidity with which it was created and the children's pleasure in its creation. As if suddenly, "a nice hiding spot (Boy 1's description of the arrangement)" was made. While working on it, Girl 1 said, "This looks nice…." Then with everyone watching, she placed her dome shape inside the hiding spot, Girl 3 placed a short cylinder next to it, Girl 1 said, "Yeah, let's just put this (dome) on top," and the arrangement was finished. The children produced a collaborative composition
they liked 'in the blink of an eye' without preplanning of any kind, amiably accepting each other's contributions.

"An underneath place"

After such a great experience with "a hiding place," it was surprising to see how excited the children became to dismantle it for another idea- the "underneath place." Girl 2's response to the question, "OK. How do we make a shape with an underneath place? A big underneath place?" was priceless. She took a deep breath, folded her arms and said, "Ah-ha (Figure 38)!

Then she said, "I think we sh-I think we should move everything high (gesturing with her arms up in the air)."

Figure 38. Rebecca Summers, *Excited to Make a Big Underneath Place*, 2010. Digital photography.

Her solution to "move everything high" was brilliant, but it took time and several suggestions from me, for the children to figure out what should go on top of the high shapes to make "a big underneath place." When Girl 3 finally pointed to the curvy square, Girl 2 said, "Yeah, let's try it!" and the two of them eagerly picked it up and set it on top of the "high shapes."
Once on top, their solutions for making it balance were accepted by everyone without criticism. Girl 1 said, "Hold it for a little while." Girl 2 said, "We need more stuff," and Boy 2 lifted up the curvy square and tried to put a small cylinder between a high shape and the top. It was clear, that their only interest was in finding a good solution, wherever it came from.

The "underneath place" arrangement collapsed twice, and the last time that it did, Girl 2 offered another endearing (and thoughtful) solution, "I suggest we put all tall things on….We put all tall things on first, and then we put the top on." "All tall things" became the inspiration and poetic solution for rebuilding the structure for the final time.

Child *: "All tall things."

Girl 2: "Uh-huh, all tall things."

(Girl 1 has set the pyramid on top of a tall cylinder.)

Girl 1: "This (a shape) isn't tall."

Boy 1 (lifting up skinny cylinder): "This isn't tall."

Girl 2 (Grabbing it out of his hand): "This is tall."

Boy 2 (Lifting up curvy square): "This-is-tall."

The completed "underneath place" arrangement, demonstrated the children's endurance, enjoyment in, and ability to create collaborative compositions by solving open-ended design problems with some help from an adult guide. Specifically, the "underneath place" arrangement demonstrated the poetic nature of their solutions and their affectionate connection to the shapes and their relationships that created the composition. The arrangement emerged, largely, from the children's own ideas and explorations. They were the authors of "all tall things," "everything standing up," and "high shapes" that inspired them to rebuild it three times.
The other compositions also demonstrated the children's enjoyment in, and ability, to solve guided open-ended problems that were metaphoric in nature. Making "a hiding place" and "a doorway to someplace they wanted to go," were ideas that captured their imagination, caused them to use critical thinking skills, social skills, and allowed for emotional connections and expressions.

Conclusion

The two patterns of behavior that emerged in the morning previewing session demonstrated several things. First, children are capable of and enjoy working collaboratively to solve design problems that are interesting to them. Second, they enjoy handling concrete objects like large geometric shapes to solve guided, open-ended design problems. Third, children were provided with an enjoyable art making experience. Finally, the session was effectively documented and analyzed.
Analysis of Illustrated Data/Morning Viewing Experience

Two significant patterns of behavior emerged in the morning viewing session: First, the children's excitement to discover the outdoor sculpture and their shapes; and second, their desire to physically explore it.

Discovering the Sculpture and Finding Shapes

Boy 1 was the first to discover the outdoor sculpture and was very excited when he did. When he saw it, he shouted, "I FOUND ONE!" and went running toward it. Girl 3 and I were just behind him. As we were walking toward the sculpture one of the girls said, "I hear bells (Figure 39)!" Then Girl 3 said, "Look! I found mine (pointing at the pyramid shape on the sculpture!" Very soon after, Girl 1 said, "Teacher, teacher. Come over and look (pointing at the falling off half-moon shape) and another child said, "Look! It's a sculpture (Figure 40)!"

Figure 39. Rebecca Summers, The Pyramid Shape on the Sculpture, 2010. Digital photography.
Figure 40. Rebecca Summers, *The Falling Off Dome*, 2010. Digital photography.

When I asked what the half-moon shape looked like it was doing, Girl 1, who was previously so excited to find it, said, "Nothin." When I said, "No, look from here, it does look like it's doing something. It looks like it's going to..." several of the children said unenthusiastically, something like it was falling off. Then Girl 1 began to tell a story about a time she almost fell off something and the rest of the group lost interest.

**Desire to Physically Explore Sculpture Rather Than Answer Questions**

Although the questions I asked during the viewing session were answered, and were sometimes met with interest from some of the children, the answers came while others were walking around the base of the sculpture, touching it (even though I continually reminded them not to), and jumping off of it. Toward the end of my questions, Girl 1 said to one of the cinematographers who had been filming her, "I like walking around up here (on the cement base)."
Conclusion

The two patterns that emerged in the morning viewing experience clearly demonstrated that children were excited to discover the sculpture and their favorite shapes, and to physically interact with the artwork. Both of which suggest that the previewing experience succeeded in preparing them to view the artwork. If children had not experienced the previewing session, they would not have known what artwork to discover, and would not have had favorite shapes to find. Children would also not have realized- to the extent they did- the unique characteristics of the sculpture. For example, Boy 1's comment "It's really heavy;" or another child's response "Look! It's a sculpture!"

The patterns also demonstrate that the viewing experience provided many enjoyable moments for children and the session was effectively documented and analyzed.
Interpretation/Morning Previewing Experience

I was very pleased with the enthusiastic responses of children to the morning previewing experience. They enjoyed collaborative efforts to create compositions with shapes, were anxious to solve many problems with shapes, and their solutions sometimes reflected metaphoric resolutions, as in the arrangements with "high shapes," "all tall things," and "a nice hiding spot." Their excited response to discovering the sculpture demonstrated that the hypothesis was correct in assuming children would be prepared to respond to the sculpture through a collaborative previewing experience.

If I were to repeat the previewing experience I would shorten the experience from thirty to fifteen minutes, limit the number of problems to be solved to two or three, rather than five, and intervene less in helping children to solve problems. I would also try to find another poster that represented the shapes clearly.

Despite the changes I would make if I were to repeat the morning previewing session, there were magical moments and two boys that made the experience memorable.

Changes-Shortened Previewing Experience/Replacing the Poster of Paris

Although, children were eager to solve every problem I posed (with the exception of Girl 2, who grew tired in the middle of the last doorway problem, and sat down on a bench to watch), the session was a little too long. Fifteen minutes would have provided ample time to prepare five and six-year-old children to view a single sculpture in a casual art museum visit. A shortened previewing experience would allow children and the Investigator to concentrate on fewer problems to be solved. As a result, there would be more time for children to work out their own
solutions to problems, reflect upon and discuss what they made, and make changes. It would also create a more relaxed atmosphere to discover and collaborate in an unhurried manner.

Replacing the poster of Paris with an image that included clearly defined shapes might also improve the previewing experience. The poster of Paris included all of the shapes in *Koda* and was a painterly image of Paris, rather than a child-like image, but children recognized only one or two of its shapes. A poster from one of Walter Wick’s colorful, child-friendly, geometric prints such as *Sky High* (Figure 41) or *Yikes!* (Figure 42), which include many clearly defined shapes used in *Koda* might be more appropriate.

![Figure 41. Walter Wick, Sky High, 2003. Pigmented inkjet photograph.](image-url)
Magical Moments-Collaborative Efforts/The Two Boys

The morning previewing session had many magical moments when children came together to create collaborative compositions. One of the purposes of my study was to prepare children to respond to Koda through the creation of collaborative compositions. The big question was, Can they do it? The answer that resounded throughout the morning previewing session was, Yes! "High Shapes," "All Tall Things," and "A Nice Hiding Spot" were particularly exciting, metaphoric collaborations to observe.

The Investigator had been advised by personnel from the Child and Family Studies Laboratory not to include the two boys, because they would not be "good candidates." After I received an email from one of the boy's mothers, however, requesting that her son and his friend-the other boy- be allowed to participate, I agreed. Both boys thoroughly enjoyed the hands-on design experience, and were assets to the group. They came up with creative solutions to guided open-ended problems, and demonstrated that when allowed to work together to solve problems that interest them, they are capable, enthusiastic, and a pleasure to work with.
Interpretation/Morning Viewing Experience

The morning viewing session, in many ways, was just what I had hoped it would be. Children were excited to discover the outdoor sculpture and wanted to explore it physically. My original intent was to let them discover and explore it and record their responses. When the actual experience happened, however, I became overly concerned about children touching the sculpture and having a free-for-all, which caused me to try to engage them in questions about the artwork. Their responses were not enthusiastic. For example, while I was asking a question, Girl 1, who was walking around on the edge of the cement base said to one of the cinematographers, "I like walkin' around up here [on the base of the sculpture]." She was not interested in answering my question about the sculpture. She wanted to enjoy it physically.

Changes-Shorten Experience/ Physical Explorations/Other Ideas

If I were to repeat the viewing session, I would plan on fifteen minutes, rather than thirty. I would structure the experience to engage children primarily in physical explorations of the sculpture related to the previewing experience, such as, having children strike a balancing pose in "an underneath place" or under "a doorway." I might also have them solve riddles about shapes and then find them on the sculpture. Other physical explorations might include hunts for shapes, the title, and handwritten name of the artist and performances such as, finding the highest part of the concrete base and jumping off of it, finding certain shapes to walk around i.e., "the biggest cylinder," "the tallest pillar," and finding shapes to stand under. Finally, I would not worry about children touching an outdoor sculpture. It's probably been touched, leaned against, and climbed many times.
Another viewing idea that would connect children's previewing and viewing experiences would be to invite them to carry the previewing shapes outdoors to try to recreate the sculpture in Koda's 'underneath place.' By doing so, children would become aware of compositional problems that were resolved by the artist, and make associations with their own compositions. After guided activities, it would be fun to see what explorations children came up with on their own.

Magical Moments

Despite all of the things I would try to do differently, the morning viewing session had several magical moments. Children were excited to discover the sculpture and their shapes, and as soon as we walked outside to find the sculpture carillon bells were ringing. They continued ringing until children's discovery of the sculpture and many of their shapes were completed. At one point, more than one child, said, "I hear bells!" as they ran to find their shapes on the sculpture.
Observational Data Illustrated/Afternoon Previewing Experience

The afternoon session began on a less positive note. It turns out that Boy 1 had been to my house several days before for a test run with the blocks. A friend of mine with a six-year-old son invited four of his friends to participate and Boy 1 was one of the friends. The test run was very different from the museum experience and began with making arrangements on a glass coffee table with two shapes at a time, then three, and eventually all of the blocks.

During the course of the experiment, one boy -not Boy 1- whispered to a friend, "This is so boring." His comment succeeded in making the other four boys- who were not acting bored-to view the experience as boring also. Unfortunately, when I became aware that Boy 1 would be in the afternoon session it was too late to find another five or just-turned-six-year-old, approved by the school, to participate. My hope was that the new experience in the art museum would override Boy 1's feelings toward the experience. It was apparent, however, from the moment he entered the previewing room that he was not excited, or at least acted unexcited, to see the blocks. His reaction influenced me, and although I tried to conceal my disappointment, my feelings, and his, may have been felt by other children in the group.

Boy 3 was also struggling when we went outside because he saw his parents and his grandfather sitting in the foyer just around the corner from the previewing room. Parents and other guardians had been invited to observe the sessions, but none of them chose to. As we entered the foyer and headed for the sculpture garden at the opposite end of the museum, he started to feel insecure. When we were outside, he didn't want to go far from the museum to find the sculpture. I offered to hold his hand which seemed to make him feel a little better, but I didn't realize why he was feeling insecure until the end of the viewing session when he said, "Um, my
Dad's inside." Later, the video footage confirmed he had seen his Dad "close to the door of the museum" as we headed outside to view the sculpture.

Boy 1 and 3's reaction to the previewing/viewing experience seemed to influence the afternoon session, or perhaps, more accurately, me. It felt very different from the morning session. Reasons for the difference may also have been due to the time of day and the mix of children, which included one girl and four boys.

The afternoon previewing experience began after I escorted five children from the Child and Family Studies Laboratory afternoon kindergarten class to the gathering area of the MOA for a brief Orientation to the experience with shapes and spaces. They were introduced to cinematographers Rebecca Summers and Brooke Parker, and invited to look for shapes in the room. For the sake of privacy, the children will be referred to as the Girl, Boy 1, Boy 2, Boy 3, and Boy 4.

After a long walk across campus to the MOA, the afternoon group was very content sitting together on the comfortable hot pink sofas in the gathering area looking for shapes and spaces in the room and talking about them. In particular, they were interested in the triangular wedge-shaped cushions and cylindrical arms of the sofas. It seemed as though they could have remained happily seated on the couches finding shapes and spaces for a long time, regardless of what activities lay ahead.

**Entering the Previewing Room**

When the orientation was over, I led the children into the previewing room and asked them to sit in front of the shapes (Figure 43). They weren't overly excited as they entered the room, but were focused on the shapes. Once seated, the Girl looked excited, Boy 2 looked
curious, Boy 3 was looking intently at me (because I was beginning to tell them what we were going to do), and Boy 4 was touching a shape behind the big curvy square.

Figure 43. Rebecca Summers, *Entering the Room*, 2010. Digital photography.

**Removing Square Shapes**

The first problem I posed was to remove all of the square shapes from the base and everyone was willing and interested to remove them (Figure 44). When the Girl started to remove a large pillar to a far end of the room, I said, somewhat anxiously, "You're fine right where you are _____ (name of Girl)," which succeeded in making the other children slightly timid about removing shapes. After asking them again which shapes had squares on them, Boy 4 wanted to remove the big cylinder, so I asked him if it had a square on it. He ended up taking off the big curvy square instead, because he discovered it had a little square window (Figure 45).

When most of the shapes with squares on them had been removed, I asked if there was any other shape that had a square on it. Boy 1 pointed to the pyramid shape and picked it up so I could see its square base and removed it. I asked again if there was another shape with a square, and Boy 3
said, "Uh-huh" as he touched the large wedge shape. I asked if it had a square on it when Boy 1 picked it up showing me the square-like base and removed it.

![Image](image1.png)

Figure 44. Rebecca Summers, *Removing Square Shapes*, 2010. Digital photography.

![Image](image2.png)

Figure 45. Brooke Parker, *Removing the Curvy Square*, 2010. Digital photography.

**Making Circle Arrangements**

After the square shapes were removed, I asked what kinds of shapes were left, and everyone said, "Circles." Then I asked them to arrange the circle shapes "together in some way that they [liked]."
Several children started working with the cylinder shapes (Figure 46), and once in a while brought over some square shapes which I reminded them were not supposed to be used in the arrangement.

Figure 46. Brooke Parker, Starting Circle Arrangement, 2010. Digital photography.

Boy 2 said, "Maybe we could make something like this (as he placed a skinny cylinder on top of a big fat one)." Then the Girl tried to balance the dome shape on top of a tall skinny cylinder as she said, "See if this will tip it…," and the arrangement collapsed. No one really cared, and Boy 1 picked up the tall skinny cylinder to put it back on the fat cylinder as he said, "I bet this is going to balance." Almost simultaneously, I asked (Boy 2 who was touching a tower of two circle shapes; the dome on a big cylinder), "What are we going to do with those two?" At the same time, the Girl was placing the dome shape low on the base next to the fat cylinder, and I rather anxiously asked another question, "How can we put all of the circle shapes on the base to make a design?" Boy 2 said, "Uh, put the big ones on the little ones" as Boy 1 placed the tall skinny cylinder back on the fat cylinder that fell off again. I promptly removed it saying, "OK, let's try this."
Concerned that the children were not getting into the circle arrangement as I would have liked, I asked them to bring all of the circle shapes close to the tall fat cylinder (which hadn't been moved since the arrangement began). They willingly did, and then I asked if they could make a low arrangement with the circle shapes. The Girl started placing cylinders lying down and together as she said, "Put this like this…and this like this." Boy 1 pointed to the dome shape and looking up at me said with a funny smile, "This is already low." When the 'low circle arrangement' was near completion (Figure 47), Boy 3 quietly stood a tall pillar next to the arrangement. He wasn't concerned that it was not a circle shape.

![Image](image_url)

**Figure 47.** Rebecca Summers, *The Low Arrangement*, 2010. Digital photography.

**Learning About the Shapes**

After making the "low circle arrangement," I asked, "What would you call a shape like this (touching a fat cylinder)…?" Girl 1 said, "I forgot what it's called," Boy 1 shrugged his shoulders, and I responded by asking (while holding up a skinny cylinder), "Have you ever seen a peppermint stick or a tootsie roll that looks like this (Figure 48)?" Why do you think they call this a tootsie roll? Can it roll?"
(Boy 1 nods his head.)

Investigator: "Show me (holding it out to Boy 1)."

(Boy 1 rolls the cylinder.)

Investigator (picking up tall rectangle): "OK, try this one with a square. Can it roll

(Figure 49)?"

(Boy 1 shakes his head and smiles.)

Investigator: "Try it."

(Boy 1 tries as he makes a silly smile.)

Investigator: "...so if you put this one down and that one down (comparing cylinder and pillar shapes), which one is more likely to stay in place?"

(Boy 1 and the Girl point to the pillar.)

After I stopped asking questions, Boy 1 gave the smaller cylinder a push to see it roll.
Finding Shapes in the Poster

Following the discussion about the rolling and stable shapes, I handed each child a shape to take over to the poster to see if they could find it in the picture. Boy 3 carried a short cylinder, which I named "a column," the Girl had a shorter pillar about which I asked: "Do you have a porch that has a big pillar like this?" (Everyone answered, Yeah.) Boy 2 carried the dome shape that he called "A watermelon (Figure 50)," and Boys 4, 3, and 2 wanted to take the big wedge shape over to the poster. I ended up giving it to Boy 4 (Boys 2 and 3 already had a shape).
As soon as the Girl was at the poster she said, "I think I found one!" She was pointing to a train at the bottom of the picture that looked rectangular in shape, referring to it as a "choo choo train." Then (pointing to a pillar on a building) I said, "What about this? Does this look like a pillar holding up this building?" Many children, answered: "Oh yeah," as the Girl held up the rectangle that looked like the pillar on the building (Figure 51).
All of a sudden, Boy 1 and then Boy 2 pointed to the pyramid shape, and Boy 1 said, "This." I said (pointing to the pyramid), "What's this?" Boy 1 said, "Pyramid" as Boy 4 kicked the wedge shape on the floor and the following dialogue occurred,

Investigator (to Boy 4, and holding the wedge shape): "Almost. That looks like a pyramid (referring to pyramid shape in the poster). Now what does [this] look like if you hold it this way (turning wedge shape)?"

Boy 2: "A-a top of the house!"

Investigator: "Yeah, it kinda looks like a roof. Can you find a roof…in the picture?"

Boy 3: "Umm…I think I found something like this."

Investigator: "OK, that's the pyramid…"

No one was able to identify the roof shape of Notre Dame or the half dome-shaped roof of another cathedral but they had a good time trying (Figure 52).

![Figure 52. Brooke Parker, Finding the Dome, 2010. Digital photography.](image)

“*A Hiding Place with a Window*”

Next, I asked the children to remove all of the shapes from the base again (there were a few left that weren't taken to the poster), and they quickly began to do it. When they were all
removed, Boy 4 decided to stomp across the base. I said (laughing), "It's probably good that we don't walk on the base." He smiled and stepped off. Then I said, "Here's what you can do. I want you to put all the shapes together so you have …a hiding place that has a window that looks outside (Figure 53)."

Boy 4 said, "I can put all these together?" I said, "Yes." Then Girl 1 placed the large curvy square with a little window on the base, while the Boys watched. Boy 1 sighed, as if he was tired, and Boy 4 said something about "making a house." Boy 3 said (while walking around the base), "I'm going to put this one (a small cylinder)... this one... I'm going to put this one here (stacks it on top of a tall pillar)." As soon as he placed the cylinder, the Girl walked the wedge around to the other side of the composition to place it inside "the hiding place (Figure 54)." Then she said quietly to Boy 1 (who was holding the pyramid on the other side of the base) while pointing to a fat cylinder, "You can put it right there." Boy 1 gently placed the pyramid on top of the cylinder as she suggested.
Then I said, "Let's say you're inside there- how are you going to hide [so] nobody can see you?"

Girl: "I would duck down because there is a little place right here."

Boy* "Put shapes down there."

Girl (walking around with a fat cylinder): "This could go there…Excuse me please _____ (names Boy 4)," (then places fat cylinder next to smaller cylinder on base) and this could kind a go…(removes small cylinder from top of large rectangle, adjusts rectangle shape, and wedge shape)."

Child * (as if he was asking the Girl): "Where does this go (referring to a shape)?"

Girl (While holding small cylinder, walks it around to opposite side of the arrangement): "And this can go like that (sets small cylinder down on opposite side of base).

Boy 3 (touching dome shape): "And this?"

Girl (places dome on top of small cylinder): "And this like that (Figure 55.)."
Finding “the in Between Space”

Once the "hiding place with a window to the outside" was complete, I asked, "What do you call this space between here (using my arm to show an in between space)?"

Boy 4 said quietly, "A door?"

Investigator: "What's this space right here?"

Boy 4 (even more quietly): "A door."

Investigator: "It's kind of an in between space, isn't it? And this (pointing underneath the dome) is an underneath space…"

Boy 1 (pointing out an in between space): "Here (Figure 56)?"

Investigator: "Right. That's an in between space."

Girl (walking around to a part of the arrangement around the corner from the boys, and touching some shapes): "This is kind of the door."

Investigator: "OK, that's kind of the door. OK. Here's your next problem. Take everything off."
Making "a Doorway to Someplace You Want to Go"

After the children enthusiastically took everything off the base, I posed another problem.

Investigator: "How would you make a doorway to someplace you want to go?"

Girl: "I think I know….Right here (placing a tall pillar standing up on the base to make a left side of a door, while boys just watch).

(Boy 4 on opposite side of base, places another tall pillar on top of a standing up big cylinder -that is off of the base- to make a right side of the door.)

Girl (to Boy 4 referring to the pillar he just placed): "Put that right there (pointing to place on the base across from the other pillar she placed.)

(Boy 4 leaves the rectangle where it is.)

(Girl picks it up and places it where she wants it.)

(Boy 4 looks perturbed and leans on standing up cylinder where pillar was and watches Girl.)
Investigator (to Boy 4): "You can help too. ______ (names Girl) isn't the only one who can help."

Investigator: "So you've got the two sides of the door….do we want something that goes over the top (moving hand over the top space)?"

Boy 1 (holding up the dome): "This?"

(Boy 4 places the cylinder he was leaning on next to the pillar making the right side of the door.)

(Girl moves many shapes, finally placing a long pillar horizontally over a cylinder and a pillar to make a door (Figure 57).

![Figure 57. Rebecca Summers, The Doorway, 2010. Digital photography.](image)

**Additions to the Doorway**

I asked the children if they could add some shapes to the door which they did, and then asked if they could make a walkway leading to the door. Suddenly, Boy 2 (who was sitting on the floor holding the wedge shape got all excited and said, "Stairs!") (He was holding the wedge shape like a ramp and it reminded him of stairs.) Then they started making "a room" instead of a walkway (Figure 58).
Making Furniture

Next, I suggested, "OK. Let's make some furniture…lamps, couches, chairs."

(Girl sets wedge down on base and tries to sit on it.)

Investigator: "How could you turn that so you really could sit on it?"

(Girl never figures it out.)

Boy 4: "I can sit on it (tries turning the wedge so he could sit on it, but doesn't figure it out either)."

(Girl sits on a standing up big cylinder.)

(Child * suggests making a couch.)

Investigator: "Yeah. We could make a couch…weren't [you] just sitting on a couch out there that was pink, and it was made out of those round shapes kind of like that (referring to a cylinder)?"

(Everyone thinks.)

(Boy 1 places a big cylinder lying down and then a pillar perpendicular to it lying down-like an arm of the couch.)
Boy 4 is holding a big pillar and Boy 1 motions for him to put it next to the other side of the lying down cylinder that is becoming a couch. Instead, Boy 4 puts it down in front of the couch shape that is being made.

(Boy1 places a tall skinny cylinder to act as the other arm of the couch.)

Girl: "How 'bout we make arms for the couch (Figure 59)?"

![Image of children working with geometric shapes](image)

Figure 59. Rebecca Summers, *The Couch*, 2010. Digital photography.

**Picking a Favorite Shape to Find Outside**

When the couch was finished, I asked everyone to pick a favorite shape. Boy 2 and 4 picked the big curvy square, Boy 1 the pyramid, and Boy 3 and the Girl picked tall pillars. When I asked Boy 3 what he would call the pillar, he didn't respond. The Girl named her pillar, "Rectangulee-er." Then I explained that we were going outside to find an artwork that was made out of shapes just like the ones they had been working with, and they needed to find their shape on the artwork. As I was explaining what we were going to do, Boy 1 (who was sitting down like the rest of the group) raised both arms up like a *Thriller* move, puffed out his cheeks and sighed.
Observational Data Illustrated/Viewing Experience

On the way outside Boy 3 spotted his Dad by the door, waved and said, "Bye," which I never saw until I watched the DVD. Just as we stepped outside the museum doors he said, "I want my Dada back." I didn't realize how serious he was.

Once outside, I asked everyone to look for shapes. As soon as Boy 2 was through the museum doors, he said (touching the point of a pyramid-topped pillar for the handicapped to open the door), "This is a period," to which I replied, "Yeah. That's a pyramid." The girl pointed to the seat and back of a bench and said, "Rectangle. Rectangle." Then I pointed to a cement tree box and she said, "Square." She also noticed the circles on the tops of the trash cans. Then Boy 3 said, "Don't go far!" I tried to assure him we weren't, and offered to hold his hand as we continued walking to the artwork.

Discovering the Artwork

While in the sculpture garden (Boy 3 had calmed down as we walked hand-in-hand), several children noticed rectangles on the Sleepwalker sculpture, and a square grate in the grass (Figure 60). As we were nearing the end of the sculpture garden I said, "Well pretty soon we're going to come close to the artwork. You tell me when you see it." Then Boy 1 said (as he rounded the corner and pointed), "I found it" and everyone continued walking toward it.
Figure 60. Brooke Parker, *The Grate*, 2010. Digital photography.

Girl: "I thought you meant the other one. It's red and …" Then I heard,

Boy 3: "Hey wait. I need to stop."

Investigator: "Are you tired?"

Boy 3: "Yeah."

Girl: "I'm not tired at all."

Then she ran alone to the artwork (Figure 61), and Boy 3 seemed to calm down. I wish I hadn't, but I called her back because I was explaining to the group that it was alright to walk around and through the sculpture, but not to touch it. Then I said, "See if you can find the curvy square with the little window." Boy 4 said, "I can (Figure 62)."
Finding the Curvy Square

Investigator: "Oh you can?"

Boy 4: "Yeah."

Boy 1 (pointing to sculpture up ahead): "It's right on top.

(Everyone moves faster toward the sculpture.)
Boy 2 (jumping up onto the base of sculpture and pointing up with two hands): "Yes. Here it is (Figure 63)"

Girl: "Uh-huh. It's kinda like a house."

Child*: "But they're (shapes) big!"

Figure 63. Brooke Parker, "Here It Is!" 2010. Digital photography.

Questions

How Heavy is the Artwork?

Next I asked, "How heavy do you think this artwork is?"

Boy 2 (lifting both arms above his head and lifting his leg like he's about to climb it):

"Super!"

Girl: "Umm…like a hundred pounds."

Boy 1 (looking at Girl as if to correct her): "A thousand pounds."

Girl (smiling and looking at me): "A thousand, and one hundred, and a billion!"

What Is the Artwork Made of?

Investigator: "What do you think it's made out of?"

(Everybody talking at once.)
Boy 2: "Triangles."
Boy 1 (matter-of-fact-ly): "Metalll."
Girl: "Steel (Figure 64)!"
Investigator: "How did you know that?!"
(Girl shrugs and smiles.)
Investigator: "What's steel?"
Boy 1 (flatly): "It's Metal."
Investigator (showing them her necklace): "Look!" It's made out of metal. Why doesn't it (the sculpture) look silvery like this?"
(Children don't respond)
Investigator: "What happened to it?"
(Boy 1 shrugs.)
Investigator: "Did it rain on it?"
Boy 1 (looking up to the sky disinterested): "Oh, it rained and it got rusty."
Investigator: "It got rusty ______ (names Boy 1), that's just right! Did the artist care?"
Girl: "No."
Boy 3 (pointing to the top of the sculpture): "Just a little bit."
Looking for the Front of the Sculpture

The next thing I asked the children to do was to find the front of the artwork. I told them there was a metal plaque "right on this (pointing to base of sculpture) cement part."

(Everyone starts to look.)

Boy 3: "Where?"

Investigator: "You [have] to look for it (Figure 65).

Child*: "Found it!"

(Talking)

Investigator: "Whose going to find it first?"

Girl: "Metal plaque, metal plaque."

Child*: "I did!"

Girl: "Ooo. Right here (Figure 66)!"

Investigator: "There it is!"
Figure 65. Brooke Parker, *Looking for Plaque*, 2010. Digital photography.

Figure 66. Brooke Parker, *Finding the Plaque*, 2010. Digital photography.

I had the children sit down in front of the plaque and explained that the artist wanted the place they were looking to be the front of the sculpture. I read his name, and asked if anyone could read the name of the sculpture. Boy 1 said quietly, *Koda*. I asked, "Do you know what a Koda is?" Boy 1: "No." I explained that it was a part of a song and that the artist thought the shapes were like notes in a song. Then the Girl said, "Oh yeah, I can see it. They're kinda like notes….I can totally see it."
Finding the Handwritten Name of the Artist

After the *Koda* discussion, everyone stood up, and Boy 3 (looking into Camera) said, "Can we go inside?" I explained we would after they found one more thing, the place where the artist signed his name by hand. I told them it wasn't on the cement base; it was on one of the shapes. Boy 1 said (pointing to a big cylinder near him), "I know. It's on that" (Figure 67), but it wasn't.

Child*: "We found it."

![Image](image.jpg)

Figure 67. Brooke Parker, "*It's On That!*" 2010. Digital photography.

Boy 1 (pointing to same cylinder shape): "I already found it."

Boy 3: "I found this before."

Investigator (goes to see): "No."

Boy 3: "I found it before."

Boy 4: "I found it! I found an L."

Boy 2 (touches large cylinder) and says quietly: "I think I found something."

Investigator: "You're kinda not very warm yet. You're getting warm_____ (name of girl)."
Investigator (to Girl): "Oh, you're soo hot_____ (name of Girl), you're hot. And _____ (name of Boy 1) you're so hot (Figure 68)!

Boy 4: "I see fire _____ (name of Boy 2). UP THERE!"

Investigator : "_____ (name of Boy 1) you're so hot!"

Boy 3 (pointing to ceiling made by curvy square): "Up there (Figure 69)!

Boy *: "It’s up there! Fire!"
Boy*: "Fire!"

Investigator (to Girl): "Look straight ahead and down…"

Girl (to Boy 1): "Straight ahead and down."

Boy 1: "Huh."

Girl: "Straight ahead and down."

Investigator (to Girl): "OK _____, (name of Girl), kneel down here and maybe you'll see it if you look straight ahead."

Boy 1 (kneeling down and pointing excitedly): "THERE (Figure 70)!

Figure 70. Rebecca Summers, "There!" 2010. Digital photography.

**Sitting Inside the Sculpture**

I concluded the viewing session by having everyone sit down in the middle of the sculpture. I explained that the artwork we were sitting in was called a sculpture because you can walk around it, and that the arrangements we made were like sculptures because you could walk around them. Then the following dialogue took place,
Investigator: "We talked about shapes today, and we made something out of shapes, and we looked at an artwork made out of shapes. What did you learn about shapes today?"

(Investigator asks Boy 3)

Boy 3: "Ummmm…. I don't know."

Investigator: "Is there anything you liked doing?"

Girl: "I think…"

Boy 4: "I-I-I…"

Investigator: "Wait a minute, let _____ (name of Boy 3) finish…"

Boy 3: "Um, I liked to do the shapes."

Girl: "Um, I learned that shapes are sometimes important."

(Investigator to Boy 1): "What did you learn_____ (name of Boy 1)?"

Boy 1 (shrugs shoulders): "I don't know."

Investigator: "Anything…?"

Boy 1: "Um, the shapes."

(Investigator asks Boy 2)

Boy 2: "Mmmm…building houses."

Boy 2: "And building the door and building and building the hiding spot (Figure 71)."

Boy 3: "Let's go inside."

Investigator: "We will go inside."

(Investigator asks Boy 4)

Boy 4: "I learned some things. Um some… some were outside."
Preparing to go Inside to Color

It was time to go back and there was still some time before the parents would be picking everyone up so I said, "Alright, … we're going to go back now and just draw a picture of the things we've bee-" and Boy 3 said, "WAIT!"

   Investigator: "What?"

   Boy 3: "I don't want to color."

   Investigator: "You don't want to color?"

   Boy 3: "No."

   Investigator: "…I can just hold your hand…we can walk there…your Mom's coming to pick you up ______, (name of Boy 3)."

   Boy 3: "Ummm, my Dad's inside."

   Investigator: "Ok. We'll find him."

   Boy 3: "He is um…close to the door of the museum."

   Everyone started walking back to the museum and the Girl said to me: "I learned so much."
**Back Inside**

Once inside, I took Boy 3 over to his Mom (who was sitting on the opposite side of the museum foyer from his Dad, close to the door. His grandfather was also there). I explained that he was missing her, and that he was a sweet boy. She looked troubled, and the grandfather said with a smile, "Wonderful, I hope everything is fine." I led the rest of the group into the previewing room and passed out white paper, and orange, yellow, and red crayons and markers. The Girl said something about drawing an elevator, and I was reminded of the trapped miners in Chile. I started to tell the children the story, and they were all very interested (Figure 72).

![Figure 72. Brooke Parker, *The Elevator Story*, 2010. Digital photography.](image)

While holding a cylinder I explained, "It was like this shape [the elevator] and it had a pointy top and a pointy bottom, and it had a door in it. Just one miner [could fit] inside the door. Then this (the cylinder) was attached to a big cable like an elevator- a steel cable- and it pulled one miner up 2000 feet from the mine to the top of the earth. And this 'rocket elevator' did this 33 times. And if [it] didn't, if somebody hadn't invented this, I think they [the miners] would have died. Because, they never would have gotten out of the trapped mine. And so, artists and engineers and scientists who invent things like this, do you think they are important?"
Girl: "Mmm-hmm."

Investigator: "Really important."

Girl: "I want to be a Mom and an inventor and a school teacher when I grow up."

**Coloring shapes**

Boy 3 returned with his mother to color, and everyone else continued to enjoy coloring shapes. Boys 1 and 4, and the Girl, colored the big curvy square, Boy 3 colored the dome shape, and Boy 2 colored the pyramid. When the coloring began, I had asked if anyone was drawing a pyramid, and later Boy 2 came up to show me his and said (while pointing to one of them), "Pyramids are right here (Figure 73)." The Girl, who saw his drawing, said, "Cool." When Boy 3 was done with his dome picture he said, "Am I finished?" I said, "Yes, you're welcome to go if you're ready." (And to his Mom, "Thank you for bringing him.") The two of them left.

![Figure 73. Brooke Parker, "Pyramids are Right Here" 2010. Digital photography.](image)

**Signing the poster**

When all of the pictures were colored I invited the four remaining children to sign their names on the poster with a black marker. I asked them to sign the "white part" below the picture,
but had to continually remind them where to sign it. They all wanted to put their names over the images (Figure 74).

![Image](image_url)

Figure 74. Brooke Parker, *Signing the Poster*, 2010. Digital photography.

The artwork downstairs and going home

It was still not time for the parents to pick everyone up, so I told the children we were going downstairs to look at another fun artwork (*Healing I*). They enjoyed playing on it. Then I took them to meet their parents in the foyer of the museum.
Analysis/Afternoon Previewing Experience

Two significant patterns emerged from the afternoon previewing experience: First, children's preference for exploring shapes and their relationships individually, instead of solving open-ended design problems as a group; and second, the dominant role the Girl and I played in directing collaborative efforts.

Individual Preferences versus Collaborative Efforts

The afternoon previewing session clearly demonstrated children's preference for individual explorations of shapes and relationships rather than discovering collaborative design solutions to open-ended problems. Each collaborative problem that was posed, which resulted in "the circle shape arrangements," "the hiding place" arrangement, "the doorway" arrangement, "the walkway" arrangements (that evolved into arrangements of "stairs" and "a room"), and the "couch" arrangement, were predominantly resolved by myself and the Girl, with the other children exploring their interests along the way.

The first “circle shape arrangement”

Making the "circle shape arrangement" was the first problem I posed. Quickly, it became apparent that children were more interested in their own explorations of the shapes than in solving collaborative problems with them. As soon as I finished posing the problem to make an arrangement out of circle shapes, Boy 4 asked, "Take all of it off? Take all?" He wasn't really focused on the arrangement idea as much as he was on handling all of the shapes. Likewise, Boy 1 began putting his favorite pyramid shape (a square shape) onto the base, and the Girl started to place the big rectangle (a square shape) onto the base. I said, "No, not the square shapes, just the
circle shapes." Then I repeated their assignment, "Can you arrange these on this square base, anyway you want. In an arrangement you like?"

The Girl and Boy 3 attempted to work collaboratively to make the circle arrangement but the other three boys had private interests. The Girl said,"How 'bout we make a wall maybe?" And Boy 3 (who wanted to place the tall skinny cylinder on top of a big fat one) said, "Maybe we can make something like this (Figure 75)." As soon as he placed the skinny cylinder on the fat one, the Girl tried to balance the dome shape on top (Figure 76), but it fell off. Boy 4 who had been watching, couldn't resist the impulse to walk across the base and knock down the skinny cylinder too (Figure 77). At the same time, Boy 2 was busy building a tower out of two cylinders (Figure 78), and Boy 1 was straddling the base watching, with his hand on his pyramid shape (a square shape).

Figure 75. Rebecca Summers, Placing the Cylinder, 2010. Digital photography.
Figure 76. Rebecca Summers, *Placing the Dome*, 2010. Digital photography.

Figure 77. Brooke Parker, *Knocking Over the Cylinder*, 2010. Digital photography.
Another attempt to make a “circle arrangement”

The first attempt to make a “circle arrangement” wasn’t resolving itself as I had hoped, so I kept trying. Again it was obvious that children were focused on their own explorations. When I asked Boy 2 (with the 'tower') "What are you going to do with those two (hoping to get him to add them to the composition)?" he replied, "Hum?" as he started to play with the top cylinder. So I asked the group again, "How can we put all the circle shapes together to make a design?"

Boy 2’s response was the only one that vaguely related to my question. Referring to the two cylinders he was playing with, he said, "Uh, put the big ones on the little ones." Meanwhile, Boy 4 was quietly building a tower (off of the base) with a tall rectangle and the pyramid on top (square shapes); the Girl was trying to replace the tall skinny cylinder that Boy 4 knocked off (her original plan) and as she did, it fell over again; and Boy 1 (while smiling at me) picked it up and replaced it (trying to help the Girl) which I anxiously removed, saying, "Let's try this."

The "low circle arrangement" and boy 4

With collaborative design making still on my mind, I decided to pose the circle arrangement problem differently. Regardless of my attempts, Boy 4 remained absorbed in his
tower. I said, "Let's put all the circles back on the square, … and let's see if we can make them all really low….How can you make an arrangement where they are all really low?" Before, and while I was posing the problem, Boy 4 had been having a great time building a tower (off of the base) with a tall rectangle topped with a pyramid (square shapes).

Unaware of what I was trying to do, he moved the tower (square shapes) to the base (Figure 79). I asked, "Take the square ones off, OK?" Thinking he heard me, I watched him lift up the pyramid like he was going to remove it but instead he placed it on top of another square pillar he had placed on the base! Surprisingly, Boy 2 (who was actually listening to me, but not taking part in the design efforts), took it from Boy 4 and placed it on the floor. Still absorbed in his own world of square shapes, Boy 4 kneeled down and placed the pillar of the tower horizontally on the base with half of it in his lap, as Boy 3 placed another pillar (square shape) next to his on the base. In the meantime, the Girl (always doing the right thing) and Boy 1 made a "low arrangement" out of circle shapes.

Figure 79. Rebecca Summers, The Tower, 2010. Digital photography.
"The hiding place"

After completing the "low arrangement," and finding shapes in the poster, I asked the group to solve another collaborative problem, "I want you to put all the shapes together so you have… a hiding place that has a window that looks to the outside." The problem was eventually solved, but solutions came largely through the Girl's enthusiastic participation and assertive personality, and my directed questions. Boy 3 wanted to participate by placing his cylinder on different parts of the arrangement, but his efforts had little to do with making a hiding place.

After I posed the new problem, the Girl was the first to offer an idea; she wanted to use the big curvy square with the little window.

Girl (picking up curvy square with window): "This is kind of hard but I can do it."

Investigator (to girl): "OK _____ (name of Girl), what's that going to be?"

Girl (pointing to the little window in the shape): "The window. There's the window. That can stay."

Investigator: "OK. Now we need to make a hiding place that looks out that window."

Boy 4: "We can build a house."

Investigator (not responding well to his statement): "Whatever you need to do to make a hiding place that can look outside a window."

Girl (to Boy 2 who is lifting up a big cylinder to add to the arrangement): "Let me put it right here (she takes the cylinder from the boy and places it next to the curvy square making a corner, Figure 80)."

Investigator (to Girl- and unaware of Boy 2's situation): "Hey, you're getting someplace."

(Boy 4 and Boy 1 are inspired to start making corners too. Boy 4 places a pillar at
another corner of the base, while Boy 1 places a large cylinder across from corner Girl made, making a second corner.)

Boy 3 (holding a small cylinder): "I'm going to put this here (on top of the curvy square which only decorates the 'hiding place')."

Investigator: "OK."

Boy 3 (taking small cylinder while walking around to another part of the arrangement):

"I'm going to put this one…this one…I'm going to put this one right here (stacks it on a tall rectangle making a corner, which still doesn't help to make a 'hiding place')."

(Girl moved wedge shape so Boy 3 was able to place the cylinder and walks it around to the other side of the arrangement. She puts it down to make a fourth corner).

(Boy 1 is holding pyramid shape on opposite side of arrangement.)

Girl (to Boy 1) says quietly, "You can put yours (pyramid) right there (on top of the big cylinder he placed as the second corner)."

(Boy 1 follows Girl's suggestion and places the pyramid.)
Making "a doorway"

Moving past the "hiding place" and the discovery of doors or in between spaces in the arrangement, I posed another collaborative problem which involved making "a doorway to someplace [they] wanted to go." Again the Girl was the first to respond to the problem, and other children were involved with personal explorations of shapes.

The Girl dominated the beginning of the collaborative effort. She placed the first pillar on the base to act as one side of the door. When Boy 4 stood up with a large pillar (he had been holding for a while) and went to put it on top of a tall cylinder (for whatever reason), Girl 1 said to him, "Put that right there (pointing to a place on the base across from the other pillar she placed). He put it where he wanted it, but she insisted, "No, right there," and moved it to her spot (Figure 81).

![Figure 81. Rebecca Summers, Taking the Pillar, 2010. Digital photography.](image)

After I encouraged Boy 4 to keep contributing, I made a suggestion to which only the Girl seemed to pay attention. I asked if the two side pillars might need something to go over the top to make a door. While the Girl worked on solving the problem, the Boys did other unrelated things. Boy 3 picked up a big cylinder and walked around with it. Boy 2 enjoyed holding the big
wedge shape in his lap and watching, and Boy 1 placed the pyramid on top of one of the side
pillars which didn't solve the problem of making a top for the door. He simply enjoyed placing
the pyramid.

Finally, the Girl figured out that a pillar could go on top of the pillars to make a door, and
(after she removed the pyramid Boy 1 had placed on top of a side pillar) she placed it
horizontally to make the door.

With the "doorway" problem solved, Boy's 1 and 4 enjoyed adding their favorite shapes
to the top of the door (Figure 82); Boy 1 added the dome, and Boy 4 added a cylinder
horizontally. Then Boy 4 stood the horizontal cylinder on end and tried to balance the tall skinny
cylinder on top of it. His experiments had little to do with making "a doorway" but they were
interesting to him.

Figure 82. Rebecca Summers, Adding Shapes to Doorway, 2010. Digital
photography.

"A walkway" turns into "stairs" and "a room"

After Boys 1 and 4 added their shapes to the top of the "doorway," Boys 2 and 3
demonstrated their personal interest in specific shapes, and their own ideas. When I asked if we
needed a walkway to the door, Boy 2 (who had been content holding the wedge shape throughout the entire doorway process) said excitedly, "STAIRS!" Suddenly, he realized the wedge shape was like a ramp, or stairs, that could lead up to the door (Figure 83). He was so excited to find a use for his favorite shape. Then Boy 3 who had been holding the biggest cylinder for the longest time, said, "No. This (pointing to the wedge shape) can go at the top (touching the top of the cylinder, Figure 84)." He wanted to make an arrangement with the cylinder and wedge shapes that had nothing to do with making "a walkway." Boy 1, who also had his own ideas, moved the curvy square next to the end of the door making "a room;" instead of "a walkway (Figure 85)." His idea was interesting to the group, and eventually the Girl sat on top of one of the big cylinders in "the room," and called it "a stool (Figure 86)."

Figure 83. Rebecca Summers, "Stairs!" 2010. Digital photography.
Figure 84. Rebecca Summers, *Showing Where the Wedge Should Go*, 2010. Digital photography.

Figure 85. Rebecca Summers, *Making "A Room,"* 2010. Digital photography.
The "couch"

The last collaborative composition, originated with a child (Boy 1), but it was largely resolved by only three of us—Boy 1, the Girl, and me. After the Girl sat on "the stool," Boy 1 said, "We could make a couch out of that." (Everyone in the group liked finding shapes on the couches in the Orientation area.) So I jumped right in saying, "Show me how you would make a couch? Weren't we just sitting on a couch out there that was pink and it was made out of those round shapes kind of like that (pointing to a cylinder)?"

Immediately, Boy 1 went to work (probably not needing my remarks to stimulate him). He placed a large cylinder horizontally on the base making the back of the 'couch.' Then he placed a large pillar and a skinny cylinder horizontally to act as arms for the couch. The Girl placed the dome inside the couch and said, "This is another kinda little stool (Figure 87)."

Meanwhile, Boy 2 was playing with the curvy square off in another part of the room, Boy 3 was alone, happily trying to balance the large wedge shape on top of another large pillar, and Boy 4 was straddling a pillar watching the couch being made.
While I was asking many questions about the process, such as, "Is this the back?" "Can you sit on this?" "This is the arm?" "What's this?" The Girl, Boy 1, and Boy 4 were making a great couch. Boy 2, who was watching, said (looking up at me smiling), "We can make it bigger!" Finally, Boy 3 came over to see the couch, and then the Girl sat on it and it was done!

Figure 87. Rebecca Summers, *Another Kind of Stool*, 2010. Digital photography.

**Conclusion**

Two significant patterns emerged from the afternoon previewing session. First, children's preference for exploring shapes and their relationships individually rather than solving collaborative open-ended design problems with them; and second, the dominant role the Girl and I played in directing collaborative efforts.

It was difficult to separate the two patterns in the analysis, as they seemed to be happening simultaneously. However, the first pattern demonstrated that the children in the afternoon group enjoyed and wanted time to explore the shapes themselves. Rather than having others direct their efforts and influence their discoveries and solutions they enjoyed satisfying their individual interests while still being a part of a group.
The second pattern demonstrated several things. First, that in my anxiousness to direct the children's efforts I was often unaware of their interests. Second, the Girl enjoyed trying to solve open-ended problems and was not concerned that the majority of children didn't, or that she was directing much of what happened. Third, other children, with the occasional exception of Boy 4, allowed her to take over collaborative efforts because they enjoyed making their own discoveries with shapes. Finally, the children enjoyed their individual explorations with shapes, despite the dominant role the Girl and I played.
Analysis/ Afternoon Viewing Experience

Two significant patterns emerged in the afternoon viewing session. First, children were not overly excited to discover the artwork or individual shapes in the artwork, but seemed at home with the sculpture when discovered; and second, they liked finding things on the sculpture more than they liked talking about it.

Pattern One

The first pattern demonstrated that the afternoon group was not overly excited to see the sculpture for the first time, but seemed at home with the sculpture when they found it. It also demonstrated that children were not anxious to find their shapes in the sculpture. The only shape they tried to find was the one that I suggested- the big curvy square with the little window, which Boy 2 was excited to find.

Discovering the artwork

Boy 1 was the first to notice the Koda sculpture. In a rather lackluster way, he pointed to it (while he kept walking) and said, "Found it (Figure 88)." Then the Girl pointed to it and started to tell me that she thought it was another sculpture we would be finding, while the rest of us kept walking toward it. When Boy 3 said (to me) "Stop!" everyone stopped; they were not overly anxious to get to the sculpture. Then he said he was tired and the Girl said she wasn't and showing the first sign of real enthusiasm, she ran excitedly toward the sculpture.
Finding the shape with the little window

The only shape any child got excited about finding was the big curvy square, and it was the one shape I had asked everyone to find. Before we reached the sculpture, I explained the rules about exploring it, and asked if anyone could find the little window. Boy 4 said (while holding his jacket over his head with two arms), "I can (Figure 89)." I asked him how he could see it. Then Boy 1 answered me (while pointing to the shape in the distance) saying, "It's- right-on- top." Only Boy 2, however, ran excitedly toward the sculpture to find it. When he got close to it, he jumped up on the base and pointed to the little window with both hands and said, "There it is!"
The second pattern that emerged in the afternoon viewing session demonstrated that children were more interested in finding things on the sculpture than talking about it. Everyone was enthusiastically involved in finding the front of the artwork with the metal plaque, and finding the place where the artist had hand-written his name. Although, they were not totally bored discussing how much the sculpture weighed, what it was made of, why it got rusty, and why the sculpture was named *Koda*, the questions did not capture the full attention of all of the children.

**Finding the front of the artwork**

No one objected to my request to find the front of the artwork with the metal plaque. In fact, as soon as I asked them, they scattered to look (Figure 90). Boy 3 was looking for it on the floor of the base saying, "Where?" The Girl was humming to herself and another child said, "Found it!" but he really didn't. Finally the Girl got off of the base and started walking around the sculpture saying, "Metal plaque. Metal plaque." Eventually, she found it, and the others, who never stopped looking, gathered around to see it (Figure 91).
Finding the artist's handwritten name

The last thing I asked everyone to find was the hand written name of the artist. The children had already found the front of the artwork, talked about the name Koda, discussed what the sculpture was made of, why it got rusty, and how much it weighed. Even after Boy 3 had just said to me, "Can we go inside?" I asked them to find the artist's name and they wanted to try.
Boy 1 said, "I know" and headed for a big support pillar. Everyone gathered around the pillar he found, but I told them that wasn't it. Even though Boy 4 was upset they hadn't found it, he kept looking. When I started telling Boy 1 and the Girl they were getting "hot." Boy 3 started running around to the place they were looking (Figure 92). Then Boy 4, who was picking up on all the "hot" words, said, "I see fire _____ (name of boy)!" "It's up there!" and another Boy said "Fire! Fire!" Finally, after everyone had been looking quite a long time, Boy 1 found the handwritten name.

Responding to questions about the sculpture

I asked the following questions about the artwork, "How heavy do you think this artwork is?" "What do you think it is made… of?" "What's steel?" "Why doesn't it look silvery like this?" "What happened to it?" "Did the artist care if it got rusty?" "Can anybody read the name of this (artwork)?" "Does anyone know what a Koda is?" Although some children gave great responses to the questions, all of the children were not excited to answer them, and at times were bored.
"How heavy do you think this artwork is?"

When I questioned the children about how heavy it was, only three responded. The Girl's response was classic, "A thousand, and one hundred, and a billion!" Boy 1 challenged her saying (with a little disgust) "A THOUSAND." Boy 2 said, "Super!" while trying to touch the ceiling. Boy 4 however, looked upset I asked (Figure 93), and Boy 3 wandered off around a corner.

![Figure 93. Rebecca Summers, Upset, 2010. Digital photography.](image)

"What do you think it's made of?"

When I asked what they thought the sculpture was made of everyone gathered around to listen and three responses came, "Metal." "Triangles!" and "Steel!" but when I asked "What's steel?" Boy 1 said bluntly, "M-e-t-a-l." I showed them my necklace and asked why the sculpture didn't look silvery like it did and Boy 1 threw his head back without a response. No one responded. Then I said, "Did it rain and…?" Boy 1 through his head back again and said bluntly, "Oh, it rained… and it- got- rusty (Figure 94)." In the meantime, Boys 4 and 2 took a walk around a big cylinder. When I asked if the artist cared if it got rusty Boy 3 responded. He pointed to the ceiling and said "Just a little bit."
Discussing the title “Koda”

The children weren't real excited to hear the artist's name read from the plaque and they weren't very interested in knowing what the name of the sculpture meant. After they found the front of the sculpture and the plaque, I had them sit in front of it. I read the name of the artist while pointing to it with my umbrella, and then asked if anyone could read the title. Boy 4 who was acting bored leaned toward the plaque and said rather mischievously, "Raymond Jonas (Figure 95)." I asked the question again, and before I could finish, Boy 1 said quietly and acting disinterested, "Koda." The others were just looking around. Then I told them that the artist thought the shapes were like notes in a song (Figure 96) and no one cared -except the Girl who said, "Oh yeah, now I can see it."
Conclusion

The patterns that emerged in the afternoon viewing session demonstrated that children were most interested in physically exploring the sculpture. It also showed that although they were not overly excited to discover it or its individual shapes, they seemed at home with the artwork as soon as they saw it, which would suggest that they had been prepared to see it. Also, some of the children's enthusiastic responses to questions relating to its weight and materials
may have been influenced by the previewing experience which gave them a comparison through which to consider them.
Interpretation/Afternoon Session

After reviewing the DVD of the afternoon session, it seems to have gone much better than I had originally thought. The footage confirmed that Boy 1 willingly, and often happily, contributed to the experience, and Boy 3 was engaged in personal ways throughout the previewing experience and many times during the viewing experience, despite issues with his Dad. The rest of the children were also involved individually or collaboratively throughout the entire session. If I were to repeat the afternoon session, however, I would change several things. First, I would shorten both the previewing and viewing experiences to fifteen minutes. Second, in the previewing experience I would pay more attention to children's explorations of shapes and relax my efforts to direct collaborative experiences of my own choosing. Finally, in the viewing experience, I would ask fewer questions about the artwork, and allow children to explore the artwork through physical means mentioned in the Interpretation of the morning session.

Boy 1

In the previewing experience, Boy 1 enjoyed removing square shapes, finding the pyramid shape in the poster, testing how well a cylinder and pillar roll, making "a room" and "a couch." In the viewing experience, he was front and center answering questions, and was eager to hunt for the plaque and handwritten name of the artist. He exhibited endurance in his search for the name and was the first to find it with great relief.

Boy 3

Before he saw his Dad, Boy 3 was engaged in the previewing experience both collaboratively and individually. He was the second child to add a circle shape to the circle arrangement and he enjoyed looking for shapes in the poster. Later on in the previewing
experience, he wanted to add a square pillar to the circle arrangement simply because he liked handling it, and took a personal stand when Boy 2 wanted the wedge shape to make stairs to the "doorway." Instead, Boy 3 wanted the wedge to sit on top of the cylinder he was holding to make an arrangement he liked.

On the way outside to view the sculpture, after Boy 3 saw his Dad, he had some insecure moments but he also enjoyed several others. In response to the rusty question, he wanted to point out a place on the ceiling of the sculpture where there was "a little bit" of rust; he was absorbed in the hunt for the little square plaque on the front of the sculpture; he got caught up in the "hot" hunt for the artist's name as he pointed to the ceiling and said, "Fire!" And he ran around to see the handwritten name for himself as soon as Boy 1 found it.

Boy 2

In the previewing experience, Boy 2 enjoyed holding the "watermelon shape" and finding it in the poster; making tower arrangements out of cylinders; and holding the big wedge shape that he was thrilled to discover looked like "stairs." In the viewing experience, he was the first to find the "little window in the curvy square;" thought the sculpture was "super" heavy; searched for the plaque and handwritten name; and enjoyed the "hot" game.

Boy 4

In the viewing experience, Boy 4 preferred doing his own thing, Building a tower of square shapes when I was asking everyone to make a circle arrangement; knocking over the tall skinny cylinder the Girl had placed; and refusing to place a big pillar where the Girl suggested. Nevertheless, he enjoyed handling the shapes and arranging them in his own way. In the viewing experience, he was annoyed when I asked about the weight of the sculpture, and told him that the big cylinder was not the place where the artist had signed his name, but he was having fun taking
charge of his experience, and letting the cinematographers know how he felt. He mischievously responded to my question about what was written on the plaque on the front of the sculpture, and finally made up his own game about "fire" when the hunt for the artist's name became "hot."

**The Girl**

In the previewing experience, the Girl was always the first child to respond to making collaborative arrangements, with the exception of the furniture arrangement, to which Boy 1 and Boy 4 initially responded by making arms for "a couch." In the viewing experience, the Girl was the first and only child to run to the sculpture when she discovered it and was untiring in responding to questions and hunts.

**Conclusion/Previewing experience**

Although the afternoon session started out on a less than exuberant note, possibly due to Boy 1’s test run with the experience a few days earlier, the mix of children in the group and time of day, and the Girl and Investigator's dominance in directing collaborative efforts, the patterns that emerged from the previewing experience demonstrated several things. First, children enjoyed handling the shapes within a community of peers and an adult guide in an art museum environment. Second, children were capable of creating collaborative designs with shapes as was most evident in their "furniture" arrangement. Finally, the experience was effectively documented and analyzed.

**Conclusion/Viewing experience**

The patterns that emerged in the afternoon viewing experience demonstrated that although children, with the exception of the Girl, were not overly excited when they first discovered the artwork or its shapes, they seemed at home with it, and later showed enthusiastic responses toward it. For example, The Girl ran alone to the sculpture because she recognized it;
Boy 4 was excited to find the "big curvy square;" and Boy 2 said the sculpture had "big shapes" as he excitedly pointed with both hands, on tip toes, to the little window in the "big curvy square." These responses support the hypothesis that children were prepared in a collaborative previewing experience to respond to *Koda*.

The patterns that emerged in the viewing experience also demonstrated that children enjoyed hunting for the title plaque and handwritten name of the artist, more than answering questions about the artwork. Everyone was involved in hunting for the plaque and name, and only a few children were involved in answering questions, which always included the Girl and Boy 1.

Overall, the Investigator feels that the responses of children to the afternoon viewing session supported the hypothesis that they were prepared through a collaborative previewing experience to respond to the sculpture; and were effectively documented and analyzed.
Conclusion

This study began as an attempt to create a collaborative, design-based learning experience for young children in an art museum. The Investigator designed the study to incorporate the "six senses" (Pink, 2006, 147) of the Conceptual Age, "design, story, symphony, empathy, play, and meaning" (p. 147), which also describe children's natural approaches to learning. Children, Vecchi (2009) said, "know in an interconnected way. They look for harmony, balance and pulse." Vecchi's description of a child's ways of knowing involve an aesthetic and meaningful pursuit for knowledge and understanding addressed by Pink. Through this study, the Investigator wanted to provide a new artistic experience for children based on the values of the Conceptual Age that nurture their ways of knowing. She also wanted to provide children with an out-of-the-ordinary experience like the ones she observed in the Metropolitan Museum of Art, the schools of Reggio Emilia, Italy, and Wick at Night, in the Museum of Art at Brigham Young University.

The Participants

The Investigator originally planned the study for four and five-year-old children who enjoy handling large block-like shapes and are particularly sensitive to metaphoric expressions (Mulcahey, 2009; Vecchi, 2004). One of the Investigator's underlying purposes in documenting the responses of children to the study was to record their poetic responses, if any, to demonstrate their natural inclination to view the world through an artistic lens. Mulcahey (2009, p. 7) explains,

8 Quoted from a lecture she gave on April 6, 2009, in Reggio Emilia, Italy.
Whereas logical tasks are often difficult for young children, they will show remarkable ease and flexibility in dealing with the complex logic of metaphor (Egan, 2001)… research shows that our ability to recognize and generate appropriate metaphors reaches its peak by age 5 and then declines (Gardner & Winner, 1979; Winner, 1988).

The Investigator was informed, however, by the Child and Family Studies Laboratory, near the date of the study, that five and six-year-old children would participate. The study demonstrated that five and six-year-olds also enjoyed handling large shapes and, at times, responded to the experience with poetic language.

**Child Appropriate Artwork**

The Investigator designed the study around an artwork that was appropriate for children to view and explore. The *Koda* sculpture fit that category, but was not the Investigator's original choice. She had first planned to use Donald Judd's *Untitled* made from four large plexi-glass cubes with dark blue, mirrored interiors and open ends. The piece was returned to the museum that loaned it to the MOA, however, before the Investigator received approval from the Internal Review Board to carry out the study. *Koda* presented itself as another good choice. Like *Untitled*, *Koda* was large, geometric, and constructive in design, which lent itself to a collaborative previewing experience related to children's past experiences with blocks. It was important to the Investigator to connect children's new experience in the MOA with their past experience so they would easily relate to it.

**Finding a Room for the Previewing Experience**

The Investigator chose the Theater/Orientation room as the venue for the previewing experience because it was attractive, spacious, uncluttered, and carpeted. Again, the original room planned for the experience was not used, which was fortunate because it was being utilized.
as a partial studio room, storage room, and office for museum personal. The room had so much going on that the Investigator felt children would have been distracted from, or hardly noticed, the shapes. The Theater/Orientation room, on the other hand, was perfect for the experience and at the time the Investigator discovered it, was not being used. Its harmonious muted taupe colors and royal blue benches complimented the red shapes. The four inch plexi-glass base highlighted the shapes which were lit by soft light from canned ceiling lights. The Investigator wanted to highlight the shapes, which were the first thing noticed by the children when they entered the room.

Hypothesis and Purposes of the Study

This qualitative, inductive study was based on the hypothesis that previewing experiences prepare children to respond to art in the museum. It was designed with two purposes in mind (1) to prepare children to respond to an artwork in the museum; and (2) to document the responses of children to the experience. Both purposes, according to Patton (1990) work in tandem.

Testing the hypothesis in the previewing experience

The Investigator tested the hypothesis by creating a previewing experience that prepared two groups of five kindergarten children to view the outdoor sculpture, Koda, by Raymond Jonas, on the grounds of the Museum of Art at BYU, without the use of reproductions. Children prepared to view the sculpture by creating collaborative compositions in response to open-ended design problems given by the Investigator with shapes one-third the size of those in the sculpture.

Testing the hypothesis in the viewing experience

The Investigator guided children to respond to the sculpture through inquiry and game-like discovery methods. Methods of inquiry allowed the Investigator to continue testing the
hypothesis by examining whether or not the previewing experience had made children aware of differences in weight, size, materials, composition, and placement of the sculpture when compared with similar characteristics of their own compositions. Game-like methods of discovery were used to encourage children to physically explore the sculpture through hunts for the title plaque and handwritten name of the artist. The games aided the Investigator in testing the hypothesis to discover if children's responses to the sculpture they explored related to their own compositions made with shapes.

**The Investigator's Response/Morning Previewing Session**

The morning previewing experience exceeded my expectations, and revealed that children enjoyed handling the shapes and were capable of and enjoyed creating collaborative compositions with them. The Investigator entered the previewing room with the children, not knowing how they would respond to the environment, shapes, or collaborative experience. When children entered the room, they immediately focused on the shapes. They did not respond to a colorful poster of Paris that included images of all ten shapes, or two stand-up images of the Eiffel tower, and Nauvoo temple. They were immediately interested in handling and exploring the shapes.

Children's collaborative responses to the Investigator's invitations to create compositions with the shapes in response to open-ended design problems such as, "How could you make an underneath place?" "A hiding place?" "A doorway to someplace you want to go?" were enthusiastic and effective. Children clearly demonstrated their capacity to work together to create many compositions with the shapes that were pleasing to them. Children's metaphoric references to shapes as being high and tall i.e., "High Shapes" and "All Tall Things" demonstrated their poetic nature and guided them to create "An Underneath Place."
Everything the Investigator hoped would happen when discovering the sculpture happened in the morning group. Children were excited to discover it and find their favorite shapes, which supported the hypothesis that the previewing experience prepared them to respond to it enthusiastically. Children were discovering the sculpture while carillon bells were ringing, which felt magical and 'out-of-the-ordinary.' Again, the feeling was something the Investigator had hoped for, but in this case, could never have planned.

Things the Investigator had not hoped for, also occurred i.e., children were not excited to talk about the sculpture and the shapes, as the Investigator decided on site she 'should' try to have them do. After all, it was an artwork worth discussing. Instead, children were excited to discover the sculpture physically and on their own terms. It would have better for the Investigator to have observed children carefully to determine how she could have assisted them in their explorations of the sculpture. Although the Investigator pointed out specific shapes on the sculpture and tried to start a conversation about them, children were more interested in physically exploring the sculpture as they would large playground equipment.

Children in the afternoon session did not respond as enthusiastically to collaborative composition making efforts as the morning group of children did. Four reasons may explain why. First, Boy 1 experienced a test run with the experience. Second, children were less active in the afternoon group. Third, the afternoon group of children consisted of four boys and one girl, compared with three girls and two boys in the morning group. Finally, the Investigator was preoccupied with stimulating collaborative efforts, instead of scaffolding children's interests.
The two interrelated patterns that emerged from the afternoon previewing session demonstrated that children preferred individual explorations of shapes over collaborative ones, and the dominant role the Girl in the group and the Investigator played in directing collaborative efforts. Both patterns represented a very different response to the experience from that of the morning group. It was apparent, however, that children did accomplish some collaborative compositions toward the end of the session, and did enjoy handling shapes individually and collaboratively.

The Investigator felt the session would have benefitted from her efforts to assist children's individual and collaborative explorations with shapes, rather than continually trying to stimulate their collaborative compositions based on her ideas, such as, creating "a circle arrangement," and "an underneath place," etc. Noteworthy collaborative efforts did emerge, but were initiated by the Investigator, such as making furniture with the shapes, in contrast to child-initiated compositions by children in the morning group with "chiminies," "high" and "tall" shapes.

**Investigator's Response/Afternoon Viewing Session**

Children's initial responses to the sculpture in the afternoon viewing experience were less enthusiastic than the responses of children in the morning viewing experience, which was disappointing to the Investigator, but their enthusiasm for discovering *Koda* seemed to grow as they physically approached the sculpture. Children enjoyed physically exploring the artwork and some of them responded enthusiastically to questions about its weight and materials. For example, the Girl's response to the question, "How heavy is it [the sculpture]?" was "A thousand, and one hundred, and a billion!" Responses like hers and children's enthusiastic responses to finding the "big curvy square," and hunts for the title plaque and artist's handwritten name
support the hypothesis that the collaborative previewing experience prepared them to respond to the artwork.

What did the Study Accomplish?

This qualitative study represents a unique contribution to research currently available on young children's experiences in museum settings. Findings supported the study's hypothesis that collaborative previewing experiences prepare young children to respond to artwork in the museum. The study also accomplished its second purpose, which was to collect data reflecting children's responses to the experience.

Produced verifiable data

The large amount of verifiable data collected from this study by reliable methods has the potential to inform programming efforts for young children in museums about the "experiential aspects…children find most rewarding" (Piscitelli and Anderson, 2000 p. 3). This study demonstrated that children found handling large shapes, exploring large shapes, and solving guided, open-ended collaborative problems with shapes, given by the Investigator, that prepared them to respond to an artwork in a museum setting, rewarding. It also demonstrated that children enjoyed responding to an artwork with similar features they had been prepared to view through physical explorations.

Highlighted potential of art museums

This study also demonstrated that art museums have the potential to provide exceptional environments for collaborative, hands-on, artistic learning experiences for young children exploring materials and processes related to original artworks. In doing so, they would provide venues to help children realize the connection "between making and perceiving art" (Anderson, 1986, p.5), nurture their aesthetic and constructive nature, and prepare them for the Conceptual
Age. It is hoped that through this study young children enjoyed being a part of a creative, design-based team that prepared them to view an artwork in a museum setting, and the study will illuminate the potential of collaborative previewing experiences to prepare young children to respond to artworks in the museum.
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