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Empowering Young Children: Multi-Method Exploration of Young Children’s Preference for Natural or Manufactured Elements in Outdoor Preschool Settings

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Introduction

Outdoor environments set the stage for children’s learning, exploration, construction, and problem invention and solving (Fjortoft, 2004). Inadequate attention is given to the learning capacity within childcare centers’ outdoor physical environment and how these environments contribute to children’s education and health (Titman, 1994). Design policies for everyday urban spaces, such as preschools, can enhance the quality of the built environments through concentrating on a ‘biophilia design’ that provides daily contact with natural spaces (Louv, 2005). Natural outdoor environments in preschools enhance children’s educational and cognitive characteristics by offering a variety of learning opportunities (Fjortoft & Sageie 2000; Fjortoft, 2004; Moore & Cosco, 2007; Moore & Wong, 1997; Wechsler, Devereaux, Davis, & Collins, 2003).

Children’s cognitive development contributes to their selection of meaningful inputs from their environment and transforms or represents these inputs based on their cognitive structures (Flavell, 1992). Cognition is a complex concept usually referring to knowledge of the physical surrounding or particular skills (Fischer, 1980; Flavell, 1992). It is essential for research on children’s place experience to regard children as individuals within a community with a right to express their opinion (Cele, 2006; Clark, 2005; Wesson & Salmon, 2001). Research is needed to understand the design features young children enjoy for their cognitive play behaviors in their outdoor preschool. However, limited data is available on the views of young children, specifically those younger than school age (Clark, McQuail, & Moss, 2003). Malguzzi’s concept of “the hundred languages of children” proposes a broader concept for listening to young children (Edwards, Gandini, & Forman, 1998). The mosaic approach of listening to young children unmasks their perspectives by bringing together visual and verbal tools, which supports “the hundred languages of children” (Clark, 2005; Clark & Moss, 2001).

Employing the mosaic approach, this research intends to explore the preferences of young children for their cognitive play behaviors in an outdoor preschool environment. The following paragraphs describe the concepts of cognitive play behaviors and elements that were employed.

Cognitive Play Behaviors

For the purpose of this study, cognitive play behaviors are classified as: (1) Functional play behavior: incorporates muscles and brain performance that develops fine and motor abilities; (2) Constructive play behavior: the child links previous information from functional play to manipulate or to create objects toward a direct goal; (3) Exploratory play behavior: not specifically related to manipulative objects, the child explores an object or the environment and thinks about what can be achieved; (4) Dramatic play behavior: correlates with detached meaning from immediate representation of objects, people, and circumstances that isolate play from its context; and (5) Games with rules: represent the final stage of development in which specific rules with associated meanings involve play behavior (Rubin, 2001).

Elements

Based on Cosco’s (2006) classification, this research classifies the elements into natural loose, natural fixed, manufactured loose, and manufactured fixed groups: (1) Natural loose: natural features are flexible, manipulative, and portable, such as flowers, sand, dirt, or leaves; (2) Natural fixed: natural components are permanently located in space, such as shrubs, trees, or large rocks; (3) Manufactured loose: artificial elements are transportable, and sometimes manipulative, such as dolls, balls, tricycle, or shovels; and (4) Manufactured fixed: fabricated physical features are steady, enduring, and rigid, such as benches, play structures, or swings. In the instance of No element, children engaged in play without any particular elements involved.

Site Selection

Given the purpose of the study, the researcher sought an outdoor learning environment with a rich natural landscape and various elements. The researcher selected an early learning center that includes three manufactured, mixed, and natural playgrounds incorporating many elements (Figure 1), and that was developed by experts on natural outdoor learning playgrounds. The accessible outdoor learning environment for four- to five-year-old children sits on approximately 0.99 acres.
Data Gathering
The combination of methods in the study relies on qualitative methods to describe and understand the complex interaction between the environment and young children. Before conducting the research, the Institutional Review Board (IRB) reviewed the research methodologies and consent forms. Parental consent and data collection permissions informed the sampling procedure for each child. In addition to the photo preference, drawing, and interviews, the researcher visited the site and observed children during outdoor play.

Method 1: Photo Preference
This study employed the photo preference method to sharpen children’s memory and communication skills (Einarsdottir, 2005). Photos were captured from settings or elements in the outdoor preschool. The researcher printed 22 pictures of the outdoor learning environment and cut each photo to a 5-inch by 6-inch size. Each child was asked, “These are the pictures of your outdoor play areas. Can you select three of your favorite pictures?” Next, the researcher asked, “Can you explain to me why you have chosen this place as your favorite outdoor play area?” If the child had not mentioned the particular favorite play engaged in that setting, the researcher asked, “What do you usually play in this setting?” To add insight about the elements children interacted with in the particular setting, the researcher asked the child, “What do you usually play with when you are over there?” After the child finished his or her explanation, the researcher expressed gratitude and asked if the child wanted to draw his or her favorite places within the outdoor preschool environment.

Method 2: Drawings from Children
This research recognizes the effectiveness of incorporating interviews with drawings in understanding young children’s thoughts (Wesson & Salmon, 2001). Combining drawings with interviews seeks to improve children’s communication about their play memories within outdoor learning environments. While the teachers were present in the class, each child selected his or her favorite photos. The researcher asked, “Can you draw me your favorite places and what you usually play in the preschool’s outdoor environment? You can recall these spaces by looking at the photos on the table.” Children were then asked about their drawing, while the researcher coded for elements based on their response.

Method 3: Interviews with Children
The researcher conducted the interviews during the preschool’s regular hours in the school building. The interviews followed the photo preference and drawing sessions, using these sessions as starting points. The researcher and child looked at the selected photos or completed drawings and talked about them. Children were asked about the reasons they sketched or selected certain behavior settings or elements with such questions as, “Can you explain to me why you drew this?” To provide deeper insight, the researcher sometimes asked, “Which areas of the outdoors do you mostly like? Which area of the outdoors you dislike? Why?”

Figure 1: The aerial view of the FEELC with configured zones.
Meanwhile, the researcher recorded each child’s response with a digital audio recorder.

**Results**

Through observation and qualitative data collection methods, rich and descriptive data were gathered. The data contributed to the interpretation of children’s cognitive play behaviors afforded by various elements within outdoor preschool environments. The following describes the results of the photo preference, drawings, and interviews.

**The Photo Preference and Linked Interviews**

Children were energetic and engaged when asked to choose the photos of their favorite play spaces. This qualitative method was ideal for children who did not want to draw. Data analysis involved coding their choices based on cognitive play behaviors and elements. The crosstab analysis explored associations between the categories of elements and preferred cognitive play behaviors. Overall, 24 children participated in the photo selection. The findings suggest that children enjoyed the green tube, swings, play structure, and sand elements. Overall, children mostly favored manufactured fixed elements (%50, N=76) and functional and dramatic play behaviors (%41, N=75).

The correlational results suggest that children preferred manufactured fixed elements for their functional (% 47.4, N=21) and dramatic play opportunities (%42.9, N=21). Children mainly appreciated natural fixed elements for their exploratory play opportunities (%66.7, N=3). In addition, children preferred natural loose elements for their dramatic play stimulation (%55.6, N=9). All three categories of elements were effective in providing ample game with rules activities.

**Drawings and Linked Interviews**

Twenty-two children took part in the drawing portion of the research. Some drawings represented children’s cognitive maps (Figure 2). Children mostly depicted manufactured fixed (%35, N=149) and natural loose (%33, N=149) elements as their favorite play elements.

**4.3 Interviews**

The drawings and photos served as starting points for interviews. After each child had finished his or her drawing, the child was asked about the drawing’s content and the play in which the child usually engaged. Children’s explanations for preferred elements and cognitive plays behaviors were coded. Crosstab analysis further explored the connection between favored categories of elements, behavior settings, and cognitive play behaviors.

Children preferred natural loose (%28, N=144) and manufactured loose elements (%20, N=144). They mainly mentioned their preference for dramatic (%34, N=144) and functional play (%33, N=144). The cross-

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Figure 2: Examples of children’s drawings.
tab analysis showed children appreciated manufactured fixed elements (%46.4, N=28) and manufactured loose elements (%41.4, N=29) for their functional play. Natural fixed elements were favored for their games with rules opportunities (%30, N=20) and dramatic play (%30, N=20). Natural loose elements were mainly preferred for their dramatic play chances (%45, N=40). Comparing elements, manufactured fixed elements were mainly favored for functional play (%27.7), manufactured loose elements for constructive play (%35.3), natural loose elements for exploratory play (%55.6) and dramatic play (%36.7), and natural fixed elements for games with rules (%27.3).

Discussion

The following paragraphs explain how children perceived what manufactured fixed, manufactured loose, natural fixed, and natural loose elements offer to their cognitive play behaviors.

Manufactured Fixed Elements and Cognitive Play Behavior Preferences

Previous studies suggest that manufactured fixed elements are one-dimensional and mostly afford functional play behaviors (Moore & Wong, 1997). The following paragraphs evaluate children’s preference for manufactured fixed elements.

(1) Play Structure: Sliding is attractive for children as it offers movement, change of speed, and experience of gravity (Moore & Wong, 1997). Children illustrated or mentioned the slide attached to the play structure many times as their favorite element. For instance, one girl explained, “I climb it up sometime, and I slide back down!” Children enjoyed standing on the stairs or the top of structure to watch others; the researcher coded this activity as exploratory play. One child explained, “I like going up the structure and looking around.” This lookout opportunity also allowed dramatic play opportunities for children.

Dramatic play links children’s imagination with outside reality, enabling children to learn and manage new experiences (Golinkoff, Hirsh-Pasek, & Singer, 2006). One of the children explained how the play structure provided this opportunity for her: “We play ‘people’ on the top, and princess over.” Another child stated, “I like hiding in the structure and pretend to be fighters.” In addition, the hiding and climbing opportunities of the play structure intrigued children’s sense of imagination.

(2) Green Tube: Tai, Haque, McLellan, and Knight (2006) theorize children’s need for private spaces to relax and escape. The green tube in the natural zone supported dramatic play behaviors by offering a sense of enclosure and privacy, and children desired going inside the tube. “I try to go inside and run away so they wouldn’t get me. I play ‘princess’ and ‘mommy’ there,” one child said of her play preferences. Children mentioned many pretend themes they play in the tube, such as “sharks,” “dinosaurs,” “mommy,” or “Star Wars.” Hart (1979) explains that hiding and lookout places are two environmental qualities that children value. The qualitative results confirmed the role the tube’s hiding and climbing affordances played in inspiring children’s games.

(3) Swing: The swinging structures granted many challenging experiences that inspired children to recognize it as one of their favorite elements. Children described the stimulating and exciting encounters the swings afforded, such as a sense of “flying.” A child described, “I like swinging because I like swinging back and forth and getting higher.”

(4) Climbing structure: The play structure incorporated the hiding and lookout qualities that children sought (Cele, 2006; Kytta, 2002). The void area created by the arched structure of the climbing structure formed a tunnel, inviting children to hide, gather, and fantasize. As one child described her hiding experience, “I hide in the sand structure and we play ‘snowy wolves’ where we hide.” Indeed, children enjoyed the climbing challenge provided by the structure; one child noted, “I climb on the little sculpture thing, and it is so fun getting down.” Consistent with previous research (Cele, 2006; Kytta, 2003; Tai et al., 2006), the climbable structures offered challenging experiences that appealed to children.

(5) Rockers: Woolley and Lowe (2012) classify the existence of rocking equipment as a sign of a challenging outdoor environment. Similar to swings, children enjoyed the swinging and rocking movement: “I like playing there because we get to rock.” The observational results suggested about 36 percent of children’s interaction with rockers included dramatic play, such as riding a “horse” or “super heroes.” During interviews, one girl explained, “I like to play ‘sick fairy’ [at the rockers]. Someone has to be the good fairy and the other one gets sick.”

Manufactured Loose Elements and Cognitive Play Behavior Preferences

Nicholson (1971) developed the theory of loose parts, which asserts that loose parts in the environment offer many play chances and stimulate creativity that is unlikely found in settings with fixed elements. The following paragraphs explain the cognitive play value of manufactured loose elements.
The following paragraphs evaluate children’s cognitive play preferences associated with natural loose elements.

(1) **Tire:** Previous studies show the popularity of elements such as tires (Weinstein & Pinciotti, 1988). Children mentioned their preference for tires and their dramatic play affordances. Children imagined playing “ducks,” “Transformers,” “unicorns,” “shooting,” “house,” “pool,” “animals,” “princess,” or “jail” in the tire. One of the respondents explained, “I go inside it, pretend to be the ‘kitties’ in the tire, and the tire is our home, and we move in the playground.” Children also appreciated how they could climb and jump from the tire, pretending to be “sky landers.” They also enjoyed how they could hide in a child-sized element, collect loose elements, and pretend to have a spatial boundary. Based on the children’s descriptions, the tire provided hiding opportunities that inspired children’s games. One girl described how she enjoyed the hiding affordance provided by the tire: “I love the tire. I get in it and I hide under it.”

(2) **Rope:** Swinging ropes are elements for inciting adventurous play, and when tied to tree branches, they provide swinging behaviors. Based on observations, children sought the challenging experience of climbing and balancing on the buckets or tree logs, holding to the ropes, and swinging. “You stand on the bucket and you swing. I like that because it’s so fun on it and I like to dance on it!” one child stated. The challenging movements provided by the ropes inspired children’s minds. Children imagined themselves as swinging monkeys, jumping off a pretended volcano, or flying through the air as “hungry birds.” Children also employed the non-attached ropes as loose materials in dramatic play.

(3) **Bikes:** Kytta (2003) considers cycling a challenging and motivating activity that excites children. Children explained how they enjoy “driving” the bikes or scooters because “they go super fast!” One child explained how biking associates with her physical skills: “I just play with bikes, because sometimes I get to go fast, even though if someone is on the bike with me. I can go really fast, because I have really strong legs.”

(4) **Tools or toys:** Toys and play props are recognized for their dramatic play value (Moore & Wong, 1997). In addition, children employed toys in their constructive and exploratory play when digging or creating music. The results imply the value of manufactured loose elements such as toys for promoting different cognitive play behavior types.

**Natural Fixed Elements and Cognitive Play Behavior Preferences**

Natural fixed elements have a moderately strong positive correlation with children’s play (NLI, 2007). The following paragraphs evaluate the cognitive play of natural fixed elements.

(1) **Trees:** Fjortoft and Sageie (2000) indicate that natural features such as trees have a positive correlation with children’s gross motor activities. The trees in the natural zone offered many dramatic play activities, where children imagined being in a forest, chasing animals, or playing “Star Wars.” The trees afforded games with rules activities such as hide-and-seek. The tree bark also stimulated children’s curiosity and sense of wonder, affording exploratory play behaviors. The study showed young children’s interest in climbing low height trees. One child explained, “I like to play ‘climb it,’ and then you have to climb a tree.” Similarly, in Cele’s (2006) study, children also enjoyed climbing shorter trees. Cele further explains climbing’s importance as both a mentally and physically challenging activity.

(2) **Rocks and boulders:** The rocks, soil, and water supported the existence of many creatures such as worms. Children moved the rocks to “see what is underneath.” One child offered, “I like playing in the rock area when there is water. We find worms.” These worms inspired children’s curiosity, suggesting the high potential of rocks for exploratory play. Children enjoyed dramatic play when exploring under the rocks, such as seeking “dinosaur bones” or “finding the worm’s mommy.” Children enjoyed the climbing, jumping, and balancing challenge of rocks because of their irregular size. One child explained, “I like to walk on the rocks because I can balance on them.” The rocks in the stone-lined swale area, however, inspired many games with rules. One girl explained how she plays hopscotch, while another girl described, “I jump on the rocks. It is called ‘jumping house.’”

(3) **Tree trunk:** Based on the observations, tree trunks inspired children’s curiosity to find bugs or creatures in the trunk. One of the children explained about his sense of curiosity: “I like to feel [touch] the trees. The bugs fell down, and we pretended they spread.” Children combined the tree trunks to build their pretend “houses” in the natural zone. Challenging children to jump, balance, or crawl over them, some tree trunks along the trail offered functional play opportunities.

**Natural Loose Elements and Cognitive Play Behavior Preferences**

Nature loose elements encourage children to manipulate their surroundings and develop their creative, dramatic, and constructive abilities (Fjortoft & Sageie, 2000; Moore & Wong, 1997; Tai et al., 2006). The following paragraphs evaluate children’s cognitive play preferences associated with natural loose elements.
(1) **Creatures:** The combination of water, dirt, rocks, and creatures enticed children’s exploratory play. Consistent with Moore and Wong’s (1997) findings, children expressed a sense of surprise and curiosity toward the natural environment. One boy explained: “I like playing in the rock area when there is water. We find worms and we put them in the water and that means that dig and die or live. If they let them be there for a long time, they would die.”

(2) **Sand:** Because of its manipulative quality, children transferred sand with their hands or containers to create pretend play materials such as a “castle,” “poison,” or “soup.” Children manipulated sand while playing pretend: “We play ‘forts’ or ‘mermaids.’” Children enjoyed the diverse opportunities sand offered for shaping and creating representative objects. Many children indicated how sand promoted their imaginary play. Children noted that they pretend to make “fire,” “poison,” “volcanoes,” “sand castles,” “ships,” or “food” with the sand. These findings indicate the value of manipulative, soft, and accessible elements such as sand for inspiring children’s imagination.

(3) **Sticks:** Cele (2006) explains how children can create special or secret places with manipulative elements such as sticks, promoting a sense of attachment. Children collected sticks to create or spread pretend fire in the camping areas. Children used sticks for dramatic or game play as “guns” or “swords.” As one child explained, “We chase each other with sticks and pretend they are swords.” Children also used sticks to dig holes in the tree trunks or the soil to find ants or bugs. They also expressed pleasure toward collecting sticks to build the stick-pile during their constructive play.

(4) **Dirt:** Natural loose elements such as dirt develop children’s building and dramatic skills (Tai et al., 2006). The softness and manipulative quality of the dirt in this study enabled children to explore it for creatures. The natural ecosystem fascinated children and their sense of curiosity. In fact, about half of children’s interaction with dirt included exploratory play behavior. Another quarter of children’s interaction with dirt involved dramatic play opportunities, as they pretended dirt to be “poison,” “food,” or “powder.” A girl explained, “When we mix the dirt, we pretend to make food.” These results highlight the value of natural loose elements for motivating children’s cognitive play.

**Conclusion**

The drawings, photo selection, and interviews from young children facilitated communication and listening to children with different abilities. Overall, the combined qualitative methods suggest children’s preference for manufactured fixed and natural loose elements. Children preferred manufactured fixed elements that offer hiding and climbing opportunities. Including natural fixed elements supports the existence of small creatures such as worms or bugs that inspire many exploratory play behaviors. Subsequently, natural loose elements inspire young children’s constructive, exploratory, and game with rules play. Manufactured loose elements appear to be supportive for functional, constructive, and game with rules behavior. In conclusion, the study accentuates how outdoor play environments with diverse elements supports diverse cognitive play behaviors, improving children’s learning and enjoyment of outdoor play.

**References**


