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**The Role of Caregiving Sensitivity and Play Behavior in a Children's Museum Context**

Jennika Mannesto

University of New Hampshire

Undergraduate Honors Thesis

May 2021

### **Acknowledgements**

I would like to thank my mentor Dr. Jill Trumbell for supporting me through all of my research at UNH and supporting me during the work of this thesis. I would also like to thank the participants in this study and the numerous research assistants who helped to collect and code data. Importantly, I would also like to thank the Children's Museum of New Hampshire for the research partnership with their organization that facilitated this work. Additionally, I would like to acknowledge the role of Dr. Kimberly Nesbitt and Dr. Jill Thorson who serve as co-principle investigators on Project ACME as well as University of New Hampshire's Hamel Center, the College of Health and Human Services, and the Grimes family for their generous financial support for this project. Lastly, I would also like to thank my family and friends for believing in me throughout this whole process.

### **Abstract**

Both play and parental sensitivity serve an important role in children's lives. This study aims to investigate how parental sensitivity and gender impact children's play in a museum environment. Specifically the research questions addressed in this study are: Is parent gender related to parental sensitivity and the types of play activities parent-child dyads engage in at the museum?; Is child gender related to parental sensitivity and types of dyadic play activities?; Does the combination of parent and child gender impact parental sensitivity and dyadic play?; and Does parenting sensitivity promote different types of play behavior in the museum context? Data collection took place at the Children's Museum of New Hampshire. Fifty-seven parent-preschooler dyads engaged in a 15 minute freeplay session in a river-themed museum exhibit, followed by 5 minutes of clean up; interactions were coded for play behavior and parental sensitivity. Analysis revealed that children spent the most time engaged in object exploration and imaginative play in the museum context and that girls engaged in more imaginative play than boys. Higher parental sensitivity was correlated with more time spent in imaginative play and less time in games with rules. No significant parent\*gender interactions were found. Implications for parenting behaviors that support positive play activities are discussed.

### **The Role of Caregiving Sensitivity and Play Behavior in a Children's Museum Context**

Play is essential for healthy child development (Milteer et al., 2012) and is thought to be one of the major developmental tasks of early childhood. It has been shown that play can enhance both cognitive and non-cognitive skills, such as social-emotional skills (Watanabe, 2019). Clearly play is imperative for children but it is important that the different types of play are distinguished because each is related to different outcomes for children (White, 2012). It's also important to note that play can occur alone, with peers or siblings, or in the context of child-parent interactions. Parents have an important role in supporting play with their children. Yet it has been demonstrated that parents may differ in their support of, and approaches to, playing with their children (Kwon et al., 2013). Some parents may engage in little play with their children while others play a great deal and extend upon the interaction by providing creative suggestions for the child. Some follow the child's lead in play and others are intrusive and redirect the child's activities when it is not needed. Such differences may indicate underlying variations in parental sensitivity to children's cues and signals (Posada et al., 1998) and may perpetuate inequities in the play experiences of children. Research also suggests that girls and boys tend to gravitate towards different types of play activities (Prioletta & Pyle, 2017), and this may be complicated by differences in how mothers and fathers engage with girls versus boys in the context of play (Lin et al., 2019). Given the benefits of play, it is critical to further disentangle the ways in which child gender, parent gender, and parental sensitivity impact play experiences.

#### **Play**

Play has many different benefits for children. For instance, play helps to develop children's imagination, encourages problem solving, promotes learning readiness, and may

increase children's memory capacity (Milteer et al., 2012). Play also provides an opportunity for children to learn how to share, negotiate, and work with others, including peers and parents. The total amount of time spent in play each day has also been shown to be important. It was found that the longer children play during the day, the higher they score on measures of memorization, exploration, and understanding, as well as better logical reasoning and problem solving (Ahmad et al., 2016). Clearly, play has very important implications for children across a wide range of developmental outcomes.

Children engage in a variety of different types of play. For instance, object play occurs when a child explores an object and learns about its properties (Yogman et al., 2018). An example of object play would be building with blocks. In contrast, social play is defined as play where a child develops games and activities and must negotiate guidelines with others. This can include dress up, make believe, and imaginary play. An example of social play would be a child playing a card game with another or taking on roles such as mother and baby. In contrast, physical play occurs when a child is using motor skills or engaging in rough and tumble play.

Replicating and building upon the work of Yogman and colleagues (2018), the current study investigates several additional types of play. Similar to Yogman et al's object play, *object exploration* includes using an object for its intended purpose (e.g., building a tower with blocks, stacking foam bricks), investigating properties of the object (e.g., looking at how a peg fits into a hole), or exploring cause and effect (e.g., seeing what happens when a child drops a toy from a staircase). The current study also breaks down Yogman et al's social play into two categories. *Games with rules* involves structured games that follow a pattern (e.g., a matching game, Go Fish) and *imaginative play* which includes make believe play. Sometimes this means the child takes on an imaginative role (e.g., pretending to be a cat or a dog, dress up) and other times it

includes giving inanimate objects life-like qualities (e.g., saying a teddy bear is in pain or naming stuffed animals). The current study also recognizes *physical play* (e.g., rough and tumble play, gross motor movements) similar to Yogman and colleagues. Additionally, sometimes play is more subtle and involves exploring or looking around the environment, pointing out things, or talking about what the child sees. This was labeled as *environmental exploration* in the current study. Some examples of environmental exploration would include pointing out a bird outside and talking about it, or noticing paintings on the wall and asking about them.

Interestingly, research has documented that different types of play promote diverse child outcomes. While few studies look at the exact categories of interest in the current study, play research more broadly supports this assertion. For example, one study looked at free play in the preschool classroom and defined it as children playing in any way they wanted to with whatever toys were available (Fekonja-Peklaj et al., 2005). This study found that free play provides an opportunity for children to use language in a more complex way than more structured play (a guided activity such as sitting and listening to a story) might not allow; specifically, during freeplay children speak more and use more multi-word utterances. This may be because free play prompts children to verbalize their thoughts to peers during role playing activities which are less common in more structured play.

Similar to free play, imaginative play encourages children to take on roles which promotes positive communication skills, problem solving, and empathy (Jent et al., 2011). Confirming the work of Fekonja-Peklaj and colleagues (2005), when playing with others, children work on oral language development during pretend play by communicating to others about their ideas and who will take on what role in play. Imaginative play also promotes children's cognitive abilities by providing practice in thinking creatively (Jent et al., 2011), and

opportunities for children to plan their behavior, and problem solve through conflict negotiation with others (White, 2012). Through such interactions with others in the context of make believe, children also develop an awareness of the needs and emotions of their playmates by engaging in perspective taking (Jent et al., 2011). Additionally, pretend play gives children the opportunity to act out emotions without it being reality, which may help develop emotion regulation skills.

Object play has also been shown to have unique benefits to the child, including physical, social, and cognitive (White, 2012). One way children develop physically is by practicing their fine motor skills through manipulating small objects and gross motor skills by manipulating large objects. Children develop their social skills when they engage in object play with others as well. Lastly, they develop their cognitive skills by problem solving and exploring cause and effect (White, 2012). In addition to these benefits, Schulz and colleagues (2008) found that the more children engaged in object play, the more causal awareness they possessed.

### **Parent Support of Child Play and Gender Differences**

While children's play may be either solitary or social, research suggests parents serve as both facilitators of, and active agents in, children's play behaviors (Cohen, 2006). Yet support of play and parenting behaviors can vary based on several factors. First, the context of play is relevant. For example, Kwon et al. (2013) found that parents were more likely to scaffold children's learning during freeplay compared to a more structured task (completing a jigsaw puzzle or shape sorting) and that children were subsequently more engaged with parents during this type of play as well. Supporting differences in parenting behavior by context, another study suggests that parents use more complex language when they engage in free play with their children versus a more structured task (Jent et al., 2011).

Engagement in play can also vary by parental gender (Warash et al., 2017). Gender differences in parents' play behaviors seem to emerge early in life. For instance, fathers as opposed to mothers are more likely to engage in social play with their infants regardless of the child's gender (McGovern, 1990). And as the child ages, some findings suggest differences in how parents *weigh* the importance of play. Among parents of preschoolers, for example, mothers seem to emphasize play more than fathers, while fathers rate more highly academic activities than do mothers at this age (Warash et al., 2017). A recent study of Chinese parent-child dyads also suggests parental differences in support of play can further vary based on type of play activity and child gender (Lin et al., 2019). Mothers engage girls in more make believe and game play than they do boys, while fathers engage in more object exploration with boys than girls.

Clearly, child gender plays a role in how parents play with their children, but it may also impact the types of activities children themselves gravitate towards. For example, research has found that girls are more likely to engage in imaginative play than are boys (Lindsey et al., 1997). Another study echoes these findings; girls engage in more imaginative play and boys in more object exploration, such as block building (Prioletta & Pyle, 2017). However, this research, much like Lin et al. (2019), also found these differences were conflated with parent gender. Both boys and girls engage in higher rates of imaginative play with mothers vs. fathers, and mothers are more likely to prompt imaginative play than fathers (Lindsey & Mize, 2001).

### **Parental Sensitivity**

Parental participation and beliefs about play may thus impact children's behaviors, both boys and girls. But it is important to note that there is variation in the quality of parental interactions with their children. One way to assess quality of parenting behavior is by assessing a parent's level of sensitivity. Parents with high levels of sensitivity perceive their child's

vocalizations and behaviors, interpret them correctly, and respond promptly and appropriately (Ainsworth et al., 1978). Mesman and Emmen (2013) build on the description of a sensitive caregiver by saying that the caregiver is able to look beyond their own needs and accurately interpret the needs of the child. If the caregiver knows they cannot obey the child's needs they are able to redirect the child or offer an alternative. The caregiver then ensures mutually satisfying interactions for both themselves and the child. In contrast, an insensitive parent is one who focuses mostly on themselves; their actions are focused on their wishes, wants, and moods, rather than the child. They fail to see from the child's perspective and often misinterpret the child's wishes and needs because their own needs are clouding their interpretation, leaving the child with a response that is partial or incomplete. Insensitive caregivers are thus often unresponsive or not prompt in their response, which typically leads the child to intensify, prolong, or repeat their signals. Other times, insensitive caregivers are harsh or inconsistent (Bretherton, 2013).

Parental sensitivity has been consistently linked with positive developmental outcomes including enhanced cognitive (e.g., Kopystynska et al., 2016) and social-emotional development (e.g., DePasquale & Gunnar, 2020). For example, high levels of sensitivity are associated with enhanced executive functioning skills, such as attentional control and inhibition (Kopystynska et al., 2016). In terms of social-emotional well being, sensitive caregiving in infancy (McElwain & Booth-LaForce, 2006) and early childhood (Posada et al., 2016) is positively correlated to secure child-parent attachment (Posada et al., 2016). Secure child-parent attachment is crucial for children's success in forming healthy relationships with peers and romantic partners in the future (Manning, 2019). Not surprisingly then, maternal sensitivity at 24 months of age is also associated with children's cooperation and positive social behavior (Blandon & Scrimgeour, 2015). Furthermore, in a study that examined the effects of both maternal sensitivity and care

provider sensitivity it was found that children had higher social competence and higher scores on applied problems such as math literacy when they had both a sensitive mother and sensitive care provider (Vesely et al., 2013). Sensitivity remains important across childhood as well. Newton and colleagues (2014) found that there were significant correlations between maternal sensitivity and prosocial behavior even in middle childhood, emphasizing the importance of sensitivity across time. In contrast, low levels of maternal sensitivity have been linked to developmental risk, including higher levels of behavior problems among toddlers (Edwards & Hans, 2016).

Importantly, parental sensitivity can vary and is affected by numerous factors, including the parent's own upbringing, personal characteristics (i.e., gender; personality), contextual factors (i.e., stress, context of interaction; Posada et al., 2018), and characteristics of the child (Belsky & Isabella, 1988), including child gender. For instance, one study found that mothers are more sensitive to their infants and more responsive than are fathers (McGovern, 1990). This finding was echoed by Hallers-Haalboom and colleagues (2014), who noted that mothers were more sensitive and less intrusive than were fathers within the same family. While Hallers-Haalboom et al. did not find any differences in sensitivity based on *child* gender, the larger body of literature on child gender is mixed. For instance, Newton et al (2014) found that fathers were more sensitive towards their daughters than with sons. In contrast, Schoppe-Sullivan et al. (2006) report mothers were more sensitive to daughters than to sons, and while mothers and fathers were equally sensitive towards sons, fathers were less sensitive to daughters than were mothers. Still other research suggests no effects of child gender on sensitive parenting behaviors (Posada et al., 2018; Trumbell et al., 2018). Clearly more research on the combined effects of parent and child gender on parental sensitivity is needed.

### **The Current Study**

The current study uses data from Project ACME (Advancing Children's Museum Engagement), a naturalistic study of parent-child interactions at the Children's Museum of New Hampshire (CMNH). Children's museums, designed to facilitate both learning and parent-child interaction, may offer an ideal context to observe parents' support of children's play during freeplay (Willard et al., 2019). This is especially so given interest in the role of parental gender, since research suggests fathers engage more frequently in play over other parental activities, such as caregiving (Renk et al., 2003). Yet no research has specifically examined sensitivity in the context of the museum, the role that sensitivity plays in supporting children's play during a museum visit, and how this may vary based on gender. To fill this research gap, this study addresses the following questions: (1a and 1b) Is parent gender related to parental sensitivity and the types of play activities parent-child dyads engage in at the museum?; (2a and 2b) Is child gender related to parental sensitivity and types of dyadic play activities?; (3a and 3b) Does the combination of parent and child gender impact parental sensitivity and dyadic play?; and (4) does caregiving sensitivity promote different types of play behavior in the museum context?

## **Methods**

### **Participants**

Seventy ( $N = 70$ ) parent-child dyads participated in Project ACME although there was a camera malfunction which led to a lack of observational data from 13 families. The remaining sample of 57 parent-child dyads will be analyzed for this study. It should be noted that only one parent per family participated so this study focuses on between family differences rather than within family differences. Of the 57 parent-child dyads included in the current study, children (56.1% female) were approximately 54.91 months ( $SD = 11.71$ ) and parents were 36.34 years old ( $SD = 11.71$ ) at time of participation. Further demographic information can be found in Table 1.

**Table 1***Sociodemographics of the Sample*

| Characteristic                           | <i>n</i> | % or <i>M (SD)</i> | Range          |
|--|----------|--------------------|----------------|
| Child                                    |          |                    |                |
| Female                                   | 32       | 56.10              | 36.21 – 81.25  |
| Ethnicity                                |          |                    |                |
| Caucasian/White                          | 55       | 96.50              |                |
| Multiracial                              | 2        | 3.50               |                |
| Age in months                            |          | 54.91 (11.71)      |                |
| Parent <sup>a</sup>                      |          |                    |                |
| Mother                                   | 51       | 89.50              |                |
| Ethnicity                                |          |                    |                |
| Asian/Asian American                     | 1        | 1.80               |                |
| Caucasian/White                          | 55       | 98.20              |                |
| Age in years                             |          | 36.34 (5.65)       | 22.00 – 48.00  |
| Highest level of education               |          |                    |                |
| High School/GED                          | 2        | 3.60               |                |
| Some college/Associates degree           | 8        | 14.20              |                |
| Bachelor's degree                        | 17       | 30.40              |                |
| Some graduate school/Graduate degree     | 29       | 51.80              |                |
| Employment                               |          |                    |                |
| Full-time                                | 23       | 46.40              |                |
| Part-time                                | 13       | 23.20              |                |
| Unemployed                               | 17       | 30.40              |                |
| Marital status                           |          |                    |                |
| Married                                  | 46       | 82.10              |                |
| Cohabiting with romantic partner         | 3        | 5.40               |                |
| Divorced/separated                       | 3        | 5.40               |                |
| Single, never married                    | 4        | 7.10               |                |
| Family income in US dollars <sup>b</sup> |          | 102.54 (60.54)     | 20.00 – 275.00 |

<sup>a</sup>One family did not report; % indicates of those reporting. <sup>b</sup>Income in 1,000s of dollars.

## Procedures

Data collection for Project ACME took place at the Children's Museum of New Hampshire (CMNH) in Dover, New Hampshire. For the project, each parent-child dyad visited the museum for a 1.5 hour visit. When the family arrived, the parent and child provided consent and assent for the project, respectively. This was followed by parental completion of questionnaires, which included demographic information. Next, the parent and child visited two different museum exhibits: a castle-themed exhibit and a river-themed exhibit. The exhibit order was randomized with 52.9% of participants visiting the castle first and 47.1% visiting the river first. Each exhibit was roped off for the duration of the interaction period so the parent and child participating in the study could use the space independently without interruptions from other children or families. In each exhibit, the parent and child engaged in free play for 15 minutes and then were instructed to clean up for up to 5 minutes. Researcher prompts varied slightly for each exhibit. Specifically, in the first exhibit, regardless of whether it was the castle or river, the parent and child were told "for the next 15 minutes, we would like to give you an opportunity to play with your child as you normally would if you just had some free time. After the 15 minutes are up, we will ask that you clean up the exhibit." For the second exhibit, dyads were told "for this exhibit, the Children's Museum has some new materials that they hope will help children learn through exploration. We would like to give you an opportunity to engage with your child in the exhibit however you see fit for the next 15 minutes. We will then ask you to clean up again." The intended purpose for the variation in prompting was to see if such prompts altered the way parent and child navigated their interaction and the materials in the exhibit. Interactions were video recorded for later coding. After visiting the two exhibits, families were compensated with a

\$20 gift card for their time; all interested families were also granted free museum admission for the day of their visit.

The current thesis will focus on interactions in the river-exhibit only. This exhibit is a river-themed ecosystem with several themed play materials for the families to use (see Appendix A for pictures of the exhibit). For example, it has capes to be worn to pretend to be caddisfly, a fish ladder with a hand crank and stuffed fish, and a walk-in treehouse with a river view. It also has a boat with a sail, hand crank, and steering wheel, as well as a beaver dam with rocks and sticks. The Project ACME research team also added in two bins of new materials, exclusive for families participating in the project. One of the bins, placed in the boat, includes large foam brick blocks. A second bin, placed near the treehouse, has a magnetic fishing game, a box and card ecosystem matching game (i.e., matching animals to their correct ecosystem), fabric intended to use as material for building a beaver dam, and wearable beaver backpacks and osprey wings (for dress up). Again, as noted above, parent-child dyads were not told they had to use these materials and if families asked if they should explore materials, researchers told them they could use whatever they liked in the exhibit during their free play session.

## **Measures**

### ***Parental Sensitivity***

Each videotaped interaction was coded for parental sensitivity by two trained coders using the *Caregiving Behavior for Preschoolers Q-sort--44 Item for Videotaped Interactions* (CBPQS-44; modified from Posada et al., 1998; see Appendix B). All coders were trained by Dr. Jill Trumbell, an expert in attachment-related Q-sort methodology. Coders first met with Dr. Trumbell to go over the Q-items, so that they could discuss and generate examples to familiarize

themselves with the behaviors of interest in the q-sort. Then, each coder watched approximately 6-8 training videos before coding project data. Coders simultaneously watched the videotaped interaction, and then each independently used the 44 items of the CBPQS-44 to describe the parent's behavior. The CBPQS is a scale used to assess the overall quality of parenting sensitivity. The modified sort used for this study contains 44 items, which are different parenting behaviors of interest, and each item is written on a separate card. Some examples of items indicating a high level of sensitivity include "behaves as part of a team, exchanges with child are harmonious," "responds promptly to child's signals (vocalizations, smiles, reaches)," and "well resolved interaction with child—interaction ends when child is satisfied (Consider termination of ongoing interactions that child is enjoying as well as interactions the child is not enjoying)." Some examples that indicate a low level of sensitivity are "parent responses to child's initiations (e.g., proximity seeking, smiles, outstretched arms, vocalizations) are incomplete or unsatisfying at times," "unaware of child's signs of distress," and "is over-controlling, intrusive, in interactions with child, e.g., provides excessive instructions, or physically re-orient child."

After watching the videotaped interaction, coders used a forced-method approach to sort the items. This is a two-step process. First coders sort the items into three piles: behaviors characteristic of the parent observed, behaviors uncharacteristic of the parent observed, and then a middle pile that includes inconsistent behaviors, unobserved behaviors, or items for which the coder is uncertain. There is no set number of items required in each pile at this time. From these three piles, coders then work from the outside in, further sorting the cards into 7 piles, with a set number of items allowed in each pile at this stage. They start by choosing the characteristic pile and sorting those cards until they run out, choosing the 5 most characteristic items for Pile 7, the

next 6 most characteristic for Pile 6, etc. Once all of the characteristic items are sorted, the coder moves to the uncharacteristic pile, and chooses the 5 most uncharacteristic items for Pile 1, next 6 most uncharacteristic for Pile 2, etc., until they run out of cards. Then they take the middle pile and fill in the remaining items. The result is a q-sort behavioral profile of items ranging from Pile 1 (score 1 or uncharacteristic of the parent) to Pile 7 (score 7 or most characteristic of the parent). For an example of the q-sort two-stage coding process and items allotted for each pile, see Appendix C.

The two coders' behavioral profiles (i.e., scores on the 44 items) were compared to check reliability. The mean inter-rater reliability was .86 ( $SD = .09$ ; range: .61 - .96). Following calculation of reliability, similar to other studies (e.g., Posada et al., 2018), coders discussed items in which they disagreed by 3 or more pile placements in order to provide the most accurate q-descriptions as possible. Following discussion, coders were free to change scores on items of disagreement (but reliability is based on pre-discussion scores only). The q-sets of the two observers (modified if there was discussion) were then averaged to provide an overall description of parental behavior during the interaction. The resulting profile was then compared to a criterion q-sort profile. The criterion profile is an average q-description, completed by three experts in the attachment field, that describes how the ideally sensitive parent would behave in the museum context. By correlating the parent's q-description to the criterion sort, we are provided with a sensitivity score (- 1 to 1) for each parent, with higher scores reflecting greater sensitivity.

### *Play*

For play, I created an original coding scheme and led coding, with consultation from Dr. Trumbell. Each interaction was coded for: (1) frequency of five different types of play; (2) total

amount of time spent engaged in each type of play; (3) who initiated play interactions; and (4) total amount of play time during the entire interaction. The types of play I coded for include: *Imaginative Play*, defined as make-believe play (e.g., pretending to be sailors, giving the beavers names) or when inanimate objects (fish, stuffed animals, etc.) are given lifelike qualities (e.g., saying the fish is in pain); *Object Exploration*, defined as using an object for its intended purpose (e.g., building tower with blocks), investigating properties of the object (e.g., talking about how the rocks and sticks Velcro to the caddisfly cape), or exploring cause and effect (e.g., seeing what happens when child drops birds from treehouse); *Environmental Exploration*, defined as looking around and exploring or pointing out things in the environment (e.g., pointing out the river outside or the paintings on the wall mural); *Games with Rules*, defined as structured games that follow a pattern, such as the box and card matching game or fishing game; and finally, *Physical Play* that includes rough and tumble play or gross motor movements. Objects used in play are not mutually exclusive to one category. For example, the dyad may build with the bricks to see how tall they stack (object exploration), and then use them in an imaginative way (e.g., as a beaver dam). Play may also be double counted as two categories. For example if the dyad is using the fishing game and making up rules and taking turns while also talking about how heavy the fish are to get on the boat, it would count as both games with rules and object exploration.

Since I was interested in the child's play, in order to be considered play the child must actually engage (touching, talking about the object, building with the object, etc.) in the play. In some instances, the parent will try to initiate play and the child will not engage. If the child doesn't engage it is not considered play and was not coded as such. The child must also engage in play for more than 5 seconds for it to be recorded. In cases where there is a disruption in play, for

example, audio recording headset problems, talking to research assistants or other museum patrons, the time spent doing these activities were recorded and subtracted from overall play time.

While a child is using the same materials different forms of play may occur over time. Many times an example of play was considered object exploration and then turned into imaginative play. An example of this might be if the child starts by cranking the fish ladder and watching the fish move up it and then the play turns to giving the fish names and having the fish start talking. In order for the play to be considered imaginative, the parent or child must verbalize “let's pretend” or clearly take on a role. For example, imagine the dyad is building something with blocks and is talking about the blocks. This starts counting as object exploration as soon as the child starts touching the blocks. If it is then suggested that the blocks are a castle for the queen to live in, it starts counting as imaginative play. As soon as the activity is labeled as imaginative and the child engages in the make believe, the play stops being recorded as object exploration and begins being recorded as imaginative play. If the blocks are labeled as a castle for the queen the whole time it is labeled as imaginative play as soon as the child engages imaginatively.

Another example of this change from one type of play to another within the same activity/playing with the same object may occur when playing a structured game. Many times when the participants are setting up a structured game they will talk about the objects in the game before engaging in the structured rules. It was common, for example, when getting out the fishing game, that parents and children talked about the colors of the different fish. This is recorded as object exploration until they actually start playing the structured game, at which time

it is then recorded as games with rules. Other times children will begin making up rules as they are getting the game out, which would be recorded as games with rules as soon as they start talking about rules.

Many families cleaned up as they were playing before the official clean up message. If so, this time didn't count toward play time unless they were being playful putting away the materials such as pretending the fish are jumping back into the bag or rolling the dice to see how many fish to put away.

If the child engages in play first or chooses what they engage in it is labeled as child initiated. If the child is engaging in a way they wouldn't have without parent prompting then it is labeled as parent initiated. When recording who prompted imaginative play it is important to listen to context. If a parent begins by saying "what are we" or "let's pretend" and a child chooses what they are or picks a persona, that is recorded as child initiated. If a parent chooses what they will be (e.g., "let's be captains!") then it is recorded as parent initiated.

Approximately 32% ( $n = 18$ ) of videotaped interactions were double coded to check for reliability. Intraclass correlation coefficients on these videos ranged from .81 - .99 (see Table 2 for a full list of play-related reliability estimates). For videos that were double coded, averages for each variable were computed and used in analyses. All other videos used data provided by only one coder (the author). See Appendix D for an example of a coding sheet used for coding play.

**Table 2***Reliability Estimates for Play Coding*

|   | ICC |
|---|-----|
| <b>Episodic Play Counts</b>             |     |
| Object Exploration                      | .88 |
| Imaginative Play                        | .94 |
| Environmental Exploration               | .91 |
| Games with Rules                        | .91 |
| Physical Play <sup>a</sup>              | —   |
| <b>Summed Time (s) in Episodic Play</b> |     |
| Object Exploration                      | .97 |
| Imaginative Play                        | .98 |
| Environmental Exploration               | .81 |
| Games with Rules                        | .99 |
| Physical Play <sup>a</sup>              | —   |
| Total Play                              | .97 |
| <b>Play Episodes Initiated by Child</b> |     |
| Object Exploration                      | .86 |
| Imaginative Play                        | .98 |
| Environmental Exploration               | .81 |
| Games with Rules                        | .90 |
| Physical Play                           | .96 |

<sup>a</sup>Of the videos double coded, none contained play classified as physical. Thus, reliability could not be assessed for these variables.

**Data Analysis**

To address my research questions, I ran statistical analyses through SPSS to find out if parent and child gender are associated with parental sensitivity and the types of play activities the dyad engages in. Specifically, descriptive analyses were explored to examine the types of play most common in the river exhibit. Pearson correlations were also examined to determine

whether the types of play related to one another, while paired *t*-tests revealed whether there were significant differences in the frequency of each type of play overall. Next, Pearson correlations were also examined to look at main effect associations between child and parent gender, parenting sensitivity, and the play behaviors of interest. Lastly, hierarchical linear regressions were examined to determine if parental sensitivity or play activities varied based on child or parent gender.

## Results

### Preliminary Analyses and Descriptives

To prepare for data analysis, normality of the variables of interest was checked. As is common in research on parenting sensitivity in non-risk samples, sensitivity was negatively skewed. It was determined that there was one outlier (sensitivity =  $-.20$ ) in the data. To help correct skew, this outlier was winsorized; it was assigned a value ( $.19$ ) closest to the next non-outlying data point ( $.20$ ) while maintaining rank order of the data. The winsorized sensitivity variable was used in all data analyses. All other variables of interest approached normality, with the exception of the physical play variable. This variable was positively skewed, but was left as is, given its relative infrequency in the data.

In general, sensitivity was relatively high ( $M = .71$ ,  $SD = .17$ ; see Table 3) for this sample. Additionally, in terms of play, children were most likely to engage in episodes of object exploration ( $M = 5.11$ ,  $SD = 2.72$ ), followed by imaginative play, environmental exploration, games with rules, and finally physical play. Paired sample *t*-tests revealed all episodic play counts significantly differed from one another. Children initiated episodes of object exploration ( $M = 3.68$ ,  $SD = 2.41$ ) most often, followed by imaginative play, environmental exploration,

games with rules, and lastly, physical play. In terms of total time in seconds spent across episodes of each type of play, a paired t-test revealed no significant difference between the amount of time spent in object exploration ( $M = 291.71$ ,  $SD = 168.84$ ) and imaginative play ( $M = 281.12$ ,  $SD = 239.58$ ) for the full sample,  $t(55) = 2.16$ ,  $p = .04$ , Cohen's  $d = .58$ . Children were, however, more likely to spend time in object exploration and imaginative play than the other three types of play. This was true for both boys and girls, though there was also no difference between the amount of time boys spent in imaginative play vs. games with rules. In total, children spent an average of 722.25 seconds ( $SD = 139.34$ ) of the observation period engaged in play behaviors. Summed time (in seconds) for each type of play was used as the focus for the remainder of play analyses.

As Table 4 shows, several of the different types of play behaviors were correlated with one another. More time spent in object exploration was correlated with less time engaged in imaginative play,  $r = -.45$ ,  $p < .001$ , and games with rules,  $r = -.32$ ,  $p = .02$ . Additionally, more time spent in imaginative play was inversely related to time spent in games with rules,  $r = -.41$ ,  $p = .001$ , while time spent in environmental exploration was positively correlated with time spent in physical play,  $r = .27$ ,  $p = .04$ .

**Table 3***Descriptives for Key Variables*

|   | <i>M (SD)</i>   | Range            |
|---|-----------------|------------------|
| Episodic Play Counts <sup>a</sup>             |                 |                  |
| Object Exploration                            | 5.11 (2.72)     | 1.00 – 12.00     |
| Imaginative Play                              | 2.46 (1.72)     | .00 – 7.00       |
| Environmental Exploration                     | 1.16 (1.07)     | .00 – 4.00       |
| Games with Rules                              | .55 (.67)       | .00 – 2.00       |
| Physical Play                                 | .08 (.32)       | .00 – 2.00       |
| Summed time (s) in Episodic Play <sup>b</sup> |                 |                  |
| Object Exploration <sub>1</sub>               | 291.71 (168.84) | 68.00 – 752.00   |
| Imaginative Play <sub>1</sub>                 | 281.12 (239.58) | .00 – 768.00     |
| Environmental Exploration                     | 25.51 (29.19)   | .00 – 114.00     |
| Games with Rules                              | 137.34 (194.64) | .00 – 759.00     |
| Physical Play                                 | 1.34 (5.98)     | .00 – 38.00      |
| Total Play                                    | 722.25 (139.34) | 281.00 – 1057.50 |
| Play Episodes Initiated by Child <sup>a</sup> |                 |                  |
| Object Exploration                            | 3.68 (2.41)     | .00 – 11.00      |
| Imaginative Play                              | 1.72 (1.63)     | .00 – 6.00       |
| Environmental Exploration                     | .84 (.86)       | .00 – 3.00       |
| Games with Rules                              | .30 (.57)       | .00 – 2.00       |
| Physical Play                                 | .02 (.13)       | .00 – 1.00       |
| Parental Sensitivity                          | .71 (.17)       | .19 – .88        |

*Note.* <sup>a</sup>All variables significantly differed from one another at the  $p < .01$  level. <sup>b</sup>Variables sharing a subscript did not significantly differ.

As Table 4 shows, several of the different types of play were correlated with one another. More time spent in object exploration was correlated with less time in imaginative play,  $r = -.45$ ,  $p < .001$ , and games with rules,  $r = -.32$ ,  $p = .02$ . Additionally, more time spent in imaginative

play was inversely related to games with rules,  $r = -.41, p < .001$ , while time spent in environmental exploration was positively correlated with time in physical play,  $r = .27, p = .04$ .

**Table 4**

*Correlations of Key Variables*

|                               | 1       | 2       | 3    | 4      | 5                | 6    | 7   | 8 |
|-------------------------------|---------|---------|------|--------|------------------|------|-----|---|
| 1. Object Exploration         | —       |         |      |        |                  |      |     |   |
| 2. Imaginative Play           | -.45*** | —       |      |        |                  |      |     |   |
| 3. Environmental Exploration  | -.12    | -.07    | —    |        |                  |      |     |   |
| 4. Games with Rules           | -.32*   | -.41*** | -.21 | —      |                  |      |     |   |
| 5. Physical Play              | .05     | -.13    | .27* | -.11   | —                |      |     |   |
| 6. Parental Sensitivity       | .00     | .33**   | .13  | -.39** | -.03             | —    |     |   |
| 7. Child Gender <sup>a</sup>  | .17     | -.28*   | .08  | .17    | .22 <sup>+</sup> | -.13 | —   |   |
| 8. Parent Gender <sup>a</sup> | -.19    | .01     | .20  | .08    | .07              | -.19 | .16 | — |

<sup>a</sup>Gender: 0=Female, 1 = Male \* $p < .05$ , \*\* $p < .01$ ; \*\*\* $p < .001$ .

### *Covariates*

Demographic variables (child age, parent age, parent education, marital status, family income) and order of exhibits (castle first vs. river first) were examined as potential covariates of parenting sensitivity and children's play behaviors. Since the main analyses focus on summed time in episodic play, only play covariates related to summed time (rather than episodic counts) were explored. Findings revealed no significant covariates of caregiving sensitivity. For play, one covariate was found. Child age was positively correlated with total amount of time spent in

imaginative play; older children engaged in more imaginative play than younger children,  $r = .36, p = .006$ . Child age was controlled for in all analyses with imaginative play as an outcome.

**Main Analyses**

***Parent Gender (Questions 1a and 1b)***

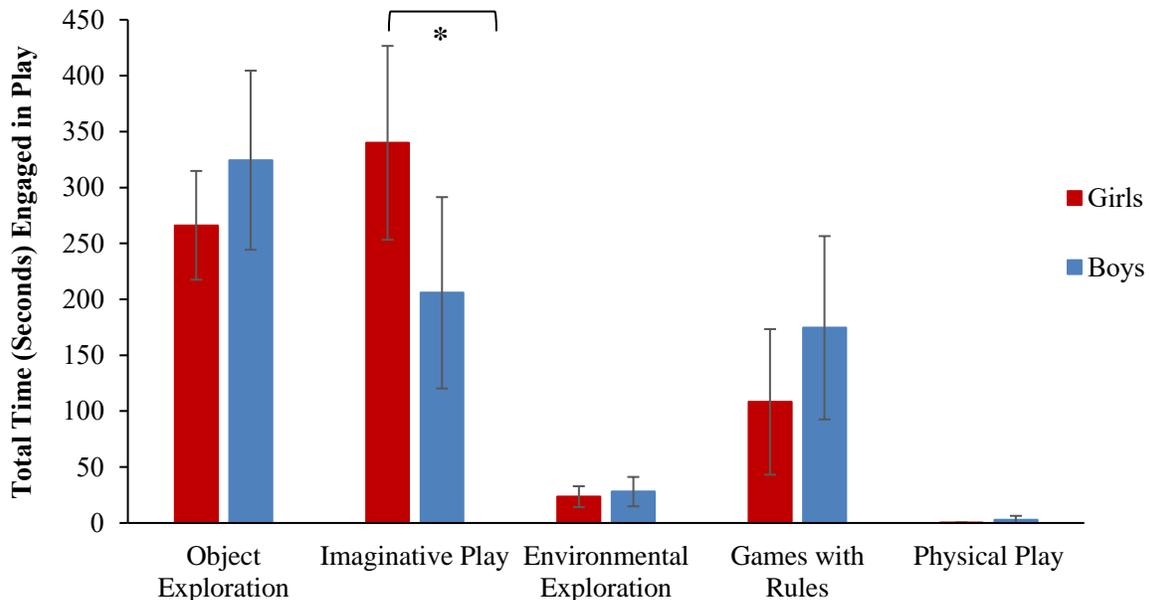
As Table 4 shows, parent gender was unrelated to parenting sensitivity,  $r = -.19, ns$ . Additionally, there were no parent gender-related differences related to the amount of time children participated in object exploration, imaginative play, environmental exploration, games with rules, or physical play.

***Child Gender (Questions 2a and 2b)***

Parenting sensitivity also did not vary based on child gender,  $r = .17, ns$  (See Table 4). However, in terms of play activities, findings revealed that girls engaged in more imaginative

**Figure 1**

*Gender Differences in Types of Play in Museum Exhibit*



Note. Error bars represent 95% Confidence Intervals. Girls engaged in more imaginative play than did boys.  $*p < .05$ .

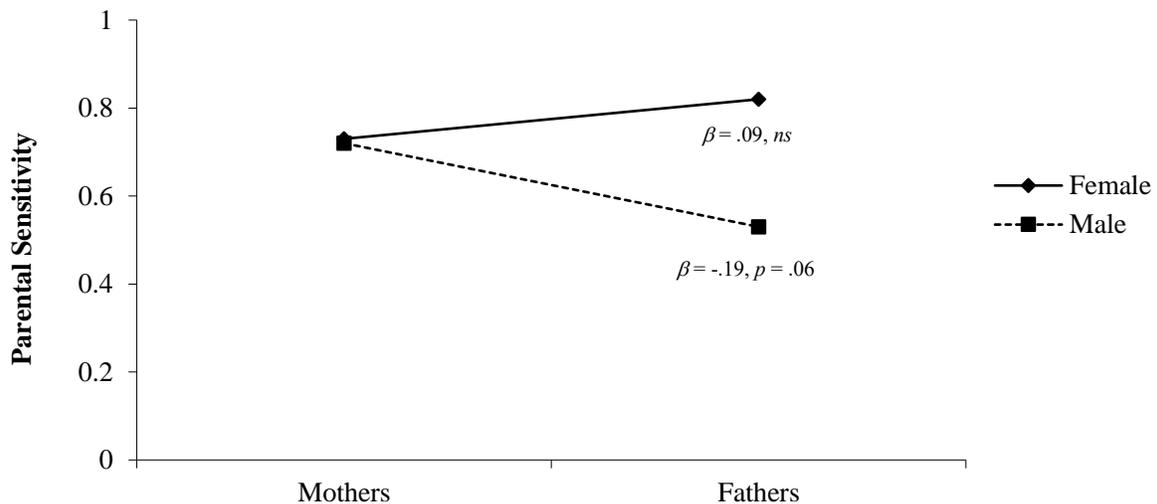
play than boys,  $r = -.29, p = .03$  (controlling for child age). No other child gender-related differences in play activities were found (see Figure 1).

### *Parent X Child Gender (Questions 3a and 3b)*

A series of regression analyses were performed to determine if parent and child gender interact to predict differences in parenting sensitivity or play activities. No significant parent\*child gender interactions were found related to play behavior (see Table 5) . However, there was a marginally significant interaction between parent and child gender in predicting caregiving sensitivity,  $b = -.44, p = .06$ . Specifically, as Figure 2 shows, fathers were marginally less sensitive towards their sons than were mothers. Due to the lack of father participation in the study ( $n = 6$ ) though, this result should be interpreted with caution.

### **Figure 2**

*Interaction between Parent and Child Gender in Predicting Parental Sensitivity*



*Note.* Mothers and fathers did not differ in their sensitivity towards girls. However, fathers were marginally less sensitive towards their sons than were mothers.

*Caregiving Sensitivity and Play (Question 4)*

Finally, correlational analyses revealed that higher levels of parenting sensitivity were correlated with greater time spent in imaginative play,  $r = .35, p = .008$ , controlling for child age. Additionally, parenting sensitivity was negatively associated with games with rules, such that children of more sensitive parents spent less time engaged in games with rules during the museum visit,  $r = -.39, p = .003$  (see Table 4). No associations were found between parenting sensitivity and object exploration, environmental exploration, or physical play.

**Discussion**

Overall, findings from this study revealed that much like research in other contexts, at a children's museum, children tend to engage in object exploration and imaginative play during free play. While girls engaged in more imaginative play than boys, no other gender differences were found related to play. Further, the results of this study conclude that parent gender did not relate to sensitivity overall or to the amount of time children spent in each type of play, though it was marginally associated with sensitivity when child gender was taken into consideration as well. Specifically, fathers were slightly less sensitive towards sons than were mothers. However, again, these findings are based on a small number of fathers participating in the study and should be examined with caution. And regardless of parent or child gender, parental sensitivity encouraged more imaginative play and less time spent in games with rules. These findings will be discussed in context of past literature.

In the current study it was found that girls engaged in more imaginative play than did boys. This aligns with work that Lindsey and colleagues (1997) completed with 35 preschool children that found that girls were more likely to engage in pretense play than boys. They define pretense play similarly to imaginative play by "using play objects to represent other objects

and/or assuming play roles including verbal relabeling of objects or role transformations ” (p. 648). Prioletta and Pyle (2017) found similar results in kindergarten classrooms in Ontario, noting that girls engaged in more dramatic play than boys. While both the work of Prioletta and Pyle and Linsey et al. focus on young children (preschool and kindergarten) like the current study, this work extends their findings in that it is conducted in the museum context and includes play during child-parent interactions rather than play in a classroom setting alone or with peers.

Interestingly, the current study did not find any differences in other types of play, notably object exploration or physical play. This was contrary to expectations, given that some past research suggests boys engage in more object exploration and in more rough and tumble physical play than girls (Prioletta & Pyle, 2017). Prioletta and Pyle focused more on overall patterns of play behavior at school which may explain differences given the focus on the museum context in the current study. Yet findings do appear to be mixed. A study of toddlers in Swedish early childhood education centers by Torill Meland and colleagues (2019) actually found that girls are more likely to engage in many different types of play than boys, including pretend play, construction play (which may overlap with object exploration) and rule-based play (e.g., games with rules). Clearly more research is needed to investigate gender differences in play.

Additionally, the current study adds to the existing literature by examining a new type of play: environmental exploration. While this type of play was not particularly common and didn't vary by gender, it is interesting to note that during child-parent interactions in the museum, children not only play with objects of interest but investigate their external environment, which could lead to rich discussions between parent and child. Future research might consider exploring this type of play in more detail and how it relates to children's language development.

Beyond child gender differences in play behavior, findings of this study showed that there were no differences in sensitivity for sons vs. daughters, but this did vary somewhat based on parent gender. As mentioned before, fathers were marginally less sensitive with sons, which aligns with the previous work of Newton et al. (2014). Again, however, this is based on a very small sample (only four father-son and two father-daughter dyads participated); more research is needed to investigate this issue. This is especially true given that past findings have been mixed, with other studies reporting opposite findings (Schoppe-Sullivan et al., 2006) or no differences based on parent gender (e.g., Trumbell et al., 2018). One additional potential factor that could account for these disparate findings aside from sample size is that different measures of sensitivity and parenting behavior were used across these studies. Overall, findings seem to support that in the museum context, mothers and fathers are equally sensitive to the needs of their children during free play when measured using a modified version of the CBPQS.

The most novel finding related to this study relates to sensitivity and play. Much like parental sensitivity has been shown to promote children's social-emotional well-being in past research, such as secure attachment and social competence (DePasquale & Gunnar, 2020), we find that it also promotes another aspect of social-emotional development: play. Specifically, it was found that parents who were more sensitive to their children spent more time engaged in imaginative play. Given that a key aspect of sensitivity (as defined by the CBPQS) is building on the focus of a child's attention, it makes sense that more sensitive caregivers promote imaginative play as they may suggest or extend upon their children's imaginative storylines. For example, if a child suggests they pretend to be boat captains, the parent might ask where the boat is going, or that they might try to capture fish on their trip. In contrast, sensitivity was negatively related to

playing games with rules. Games with rules are a more structured form of play compared to open-ended make believe. Some of the defining characteristics of insensitive parenting behavior include a greater sense of being rigid or inflexible with rules, and being object-oriented in play (that is, focusing on objects with little commentary or expansion upon play themes). Thus, games with rules may feel like a more “comfortable” form of play for less sensitive caregivers.

### **Strengths, Limitations, and Future Directions**

In addition to being the first study to examine associations between sensitivity and play in a museum context, other strengths of the study include observational assessments and a novel play coding scheme. Yet despite these strengths, several limitations exist. First, the study included a relatively small sample who was homogenous in regards to race/ethnicity, parent gender, and income. This may limit the generalizability of the study to other populations. Another more technical difficulty encountered was the inability to completely control interruptions of child-parent play, due to the fact that the museum is a public space and visits were conducted during open hours. Other children often walked into the exhibit while filming, interrupting play. Additionally, there were loud families in neighboring exhibits that sometimes made it difficult to hear participants. This was especially so when considering the final limitation, which is that there were also technical problems with the audio recording headsets (e.g., signal was lost between receiver and adapter and/or some children refused to wear the headset). Future research might consider conducting visits outside of normal museum operation hours to reduce such outside interference in the research study. In the future we would also like to increase the sample size, especially for fathers. This would also potentially facilitate an investigation into within-family comparisons. The current study focused on between-family

differences, but much rich information remains to be gained by examining how mothers and fathers within the same family vary in their support of children's play through their sensitive parenting behaviors.

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Appendix A

Pictures from the River-Themed Exhibit at the Children’s Museum of New Hampshire



**Appendix B**

## Caregiving Behavior for Preschoolers Q-Set—(44 Item) Videotaped Interactions

1. Unaware of child's signs of distress.
2. Participates in play with child, e.g. plays with toys with child.  
*Low: Supervises only; sits on the sidelines.*
3. Initiates approach and physical contact, does not always wait for child to do it.  
*Low: Child is the main initiator of close interactions.*
4. Interactions with child occur almost exclusively at a distance.  
*Low: Appropriate balance between interactions at a distance and in close physical contact.*
5. Interactions appropriately vigorous and exciting as judged from child's response.  
*Low: Interactions are not exciting enough or too overwhelming.*
6. Responds only to frequent, prolonged, or intense signals (e.g., only responds when child increases or maintains signals).
7. Makes child feel s/he is successful in solving tasks or doing activities.  
*Low: Is indifferent or negative regarding child's accomplishments.*
8. Enjoys physical contact with child.  
*Low: Awkward and ill at ease during intimate interactions with child.*
9. Doesn't interact much with child.  
*Low: Frequently interacts with child.*
10. When child returns to her/him, mother/father is unresponsive or business like in acknowledging child's returns.  
*Low: Mother/father is affectionate with him/her.*
11. Pushes child into activities he doesn't want to do.  
*Low: Suggests and encourages but does not "force" child into activities.*
12. Frequently uses verbal prohibitions (e.g., "no" or "don't")
13. Responds to ordinary bids for attention, i.e., when child is not upset (vocalizations, smiles, reaches).

14. Is over-controlling, intrusive, in interactions with child, e.g., provides excessive instructions, or physically re-orient child.

*Low: Provides assistance when necessary. Physical interventions are smooth.*

15. Harsh affect in interactions with child.

Middle: Flat affect in interactions.

*Low: Interactions warmly with child.*

16. Behaves as part of a team, exchanges with child are harmonious.

*Low: Not smooth in exchanges with child; is abrupt; creates unnecessary conflict.*

17. When child expresses positive affect, joins in.

*Low: Unresponsive to child's expression of positive affect.*

18. Doesn't seem genuinely "into" child's play.

*Low: Seems interested/amused by child's play.*

19. Praises child for things he/she does.

*Low: Doesn't notice or point out successes.*

20. Points to and identifies interesting things in child's environment.

21. Builds on the focus of child's attention.

22. Doesn't structure child's activities in ways that guarantee success.

*Low: Sets up child for success.*

23. Is two steps ahead of child, anticipates potential conflictive situations and does something to prevent escalation.

*Low: Let's child get into conflictive situations. Needs to intervene to re-orient child's activities.*

24. Teaches child names of objects, labels activities; is instructive.

*Low: Does not label objects and activities for child.*

25. When child shows something he is playing with to parent, parent asks about it, comments positively on it, encourages child to do something with it.

*Low: Doesn't seem interested; tells child to go and play with it or not to (e.g. "leave it aside")*

26. When helping child, doesn't solve problems for child, but paces him/her through solutions.

*Low: Either provides unhelpful clues, or solve problem for child.*

27. Unnecessarily tells child what to do.

*Low: Uses questions or presents options as means of guidance.*

28. Suggests activities that are not enticing to child, or doesn't suggest activities.

*Low: Suggests imaginative or engaging activities.*

29. Smoothly facilitates explorations away from and returns to her/him.

*Low: Not interested or affectionate when child returns; not encouraging of child going back out.*

30. Makes sure that child explores available toys or activities.

*Low: Let's child stay on one activity/toy, become bored, or wander around.*

31. Well resolved interaction with child—interaction ends when child is satisfied (Consider termination of ongoing interactions that child is enjoying as well as interactions the child is not enjoying)

32. Interactions with child are object oriented (e.g., going through motions with toys...little social component).

33. When child cries/signals, delays in responding or checking what's going on.

*Low: Responds or checks with child promptly.*

34. When child is disappointed/upset, either ignores or is not skillful in calming child down and getting him/her back to play.

*Low: Quickly able to calm child down and re-orient him/her to activities.*

35. Is critical/annoyed with child; “you are clumsy, I told you not to...”

*Low: Patient and understanding*

36. Over-reacts or becomes distressed if child engages in mildly risky or unsafe behavior.

*Low: Keeps calm and gets child out of trouble.*

37. Responds promptly to child's signals (vocalizations, smiles, reaches).

38. Parent is hovering, e.g., gets into child's activities even when it is not necessary.

*Low: Balanced in role as supervisor of and participant in child's activities.*

39. Parent responses to child's initiations (e.g., proximity seeking, smiles, outstretched arms, vocalizations) are incomplete or unsatisfying at times.

*Low: Child's initiations are always responded to in a complete and satisfying manner.*

40. Minimizes importance of child's cues; fails to see things from child's point of view.

*Low: Child cues are given appropriate weight; parent is empathic.*

41. Accepts child's expression of negative emotion.

*Low: Seems uncomfortable, or annoyed, or tries to cut off expression of negative feelings.*

42. Seldom speaks to child directly.

43. Expresses to child that she/he is having a good time.

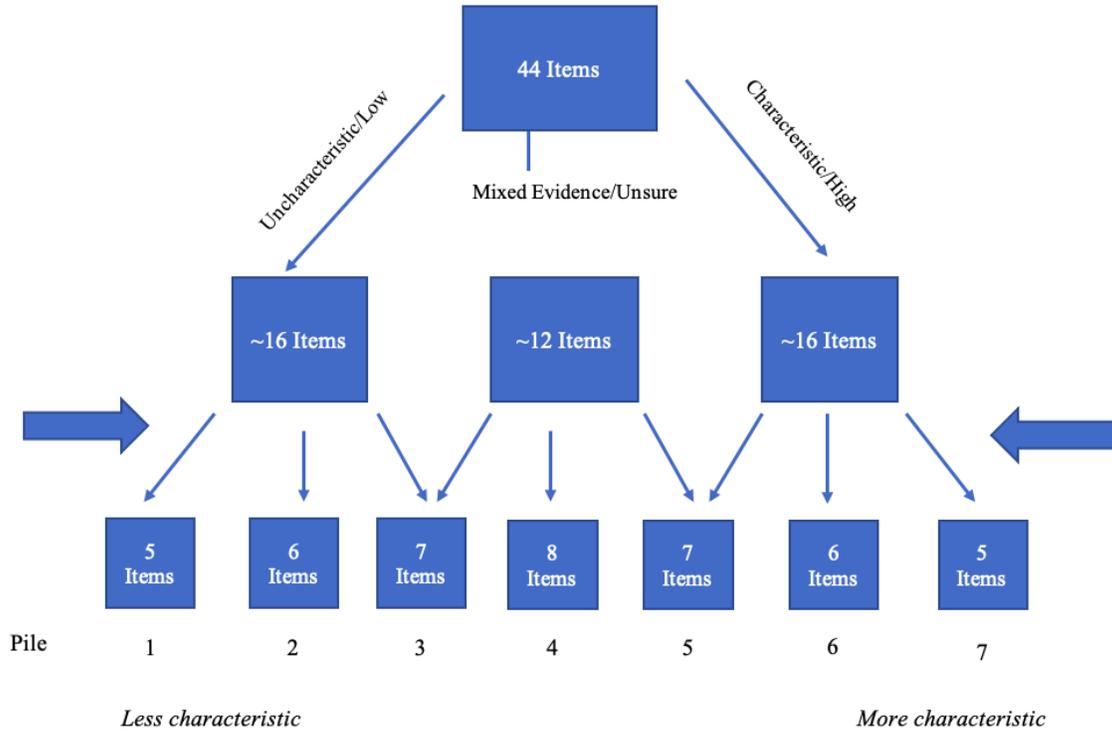
*Low: It shows through that she/he is not enjoying themselves.*

44. Asks or talks with child about his/her feelings or experiences during play.

*Low: Doesn't attend to the emotional components of play.*

### Appendix C

#### Example of the Q-Sorting Procedure



**Appendix D**

Example Play Coding Sheet

| Example                 | Type of Play | Initiated by      | Time Start | Time Stop         | Total Time | Notes               |
|-------------------------|--------------|-------------------|------------|-------------------|------------|---------------------|
| Sail                    | OE           | C                 | 0:45       | 1:08              | 0:23       |                     |
| Wheel                   | OE           | C                 | 1:45       | 2:13              | 0:28       |                     |
| Under treehouse         | EE           | C                 | 2:37       | 2:57              | 0:20       |                     |
| Fish ladder             | OE           | C                 | 3:08       | 3:52              | 0:44       |                     |
|                         | OE           | C                 | 4:58       | 5:58              | 1:00       |                     |
| Beavers                 | OE           | P                 | 6:20       | 7:30              | 1:10       |                     |
| Mail                    | OE           | C                 | 7:48       | 8:11              | 0:23       |                     |
| Eagle wings             | OE           | P                 | 8:18       | 8:54              | 0:36       |                     |
| Fishing game            | OE           | P                 | 10:00      | 10:26             | 0:26       |                     |
| Eagle wings             | OE           | C                 | 10:55      | 11:27             | 0:32       |                     |
| Boat                    | IP           | C                 | 11:53      | 12:03             | 0:10       |                     |
|                         | IP           | P                 | 12:41      | 13:25             | 0:44       |                     |
| Sail                    | OE           | C                 | 13:32      | 14:17             | 0:45       |                     |
| Bricks                  | OE           | P                 | 14:38      | 16:11             | 1:33       |                     |
|                         |              |                   |            |                   |            |                     |
| Clean up message: 15:52 |              |                   |            |                   |            |                     |
| Total time: 18:16       |              |                   |            |                   |            |                     |
|                         |              |                   |            |                   |            |                     |
| <b>Total OE</b>         | <b>11</b>    | <b>CinitOE</b>    | <b>7</b>   | <b>PinitOE</b>    | <b>4</b>   | <b>TimeOE 8:00</b>  |
| <b>Total IP</b>         | <b>2</b>     | <b>CinitIP</b>    | <b>1</b>   | <b>PinitIP</b>    | <b>1</b>   | <b>TimeIP 0:54</b>  |
| <b>Total EE</b>         | <b>1</b>     | <b>CinitEE</b>    | <b>1</b>   | <b>PinitEE</b>    | <b>0</b>   | <b>TimeEE 0:20</b>  |
| <b>Total GwR</b>        | <b>0</b>     | <b>CinitGwR</b>   | <b>0</b>   | <b>PinitGwR</b>   | <b>0</b>   |                     |
| <b>Total Other</b>      | <b>0</b>     | <b>CinitOther</b> | <b>0</b>   | <b>PinitOther</b> | <b>0</b>   | <b>TotPlay 9:14</b> |