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## **Sandwich or soap? : object substitution during pretend play by very young children.**

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SANDWICH OR SOAP? OBJECT SUBSTITUTION DURING PRETEND PLAY BY  
VERY YOUNG CHILDREN

A Thesis Presented

by

DAWN K. MELZER

Submitted to the Graduate School of the  
University of Massachusetts Amherst in partial fulfillment  
of the requirements for the degree of

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Department of Psychology


SANDWICH OR SOAP? OBJECT SUBSTITUTION DURING PRETEND PLAY BY  
VERY YOUNG CHILDREN

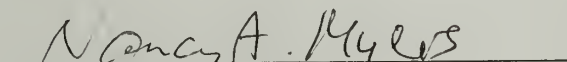
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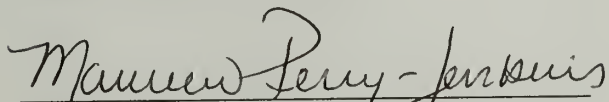
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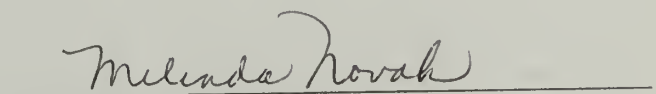
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# TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS .....	iii
LIST OF TABLES .....	vi
CHAPTER	
1. INTRODUCTION.....	1
A. The Development of Pretend Play .....	2
B. Cognitive Significance.....	5
C. Theories on Object Substitution During Pretend Play .....	7
2. STUDY DESIGN.....	14
3. METHODS .....	18
A. Participants.....	18
B. Materials.....	18
C. Procedure .....	19
a. Warm-up phase.....	19
b. Experimental phase.....	19
c. Memory phase .....	24
d. Free-play phase.....	25
D. Scoring & Analyses of Data .....	25
4. RESULTS .....	28
A. Warm-up .....	28
B. Experimental Trials .....	28
C. Memory Trials .....	30
D. Free Play.....	32
E. Survey Responses.....	33
5. DISCUSSION .....	35
A. Object Substitution in Pretend Play .....	35
B. Memory for Object Subsitiutions in Pretend Play.....	39
APPENDIX: SURVEY QUESTIONS DISTRIBUTED TO PARENTS .....	54

REFERENCES.....	55
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## LIST OF TABLES

Table	Page
1. Object Substitutions in the Between- and Within-Scenario Conditions .....	45
2. Appropriate Actions for Substituted Objects in the Experimental and Memory Trials .....	46
3. Mean Numbers (and Standard Deviations) of Appropriate Actions on the Experimental Trials by Age and Condition.....	47
4. Mean Numbers (and Standard Deviations) of Correct Actions for Both Object Identities During Experimental Trials by Age and Condition.....	48
5. Successful Mean Actions (and Standard Deviations) on the First vs. Second Presentations of the Substitute Objects During Experimental Trials by Age and Condition .....	49
6. Mean Numbers (and Standard Deviations) of Correct Object Choices on Memory Trials by Age and Condition .....	50
7. Mean Numbers (and Standard Deviations) of Appropriate Object Actions During the Memory Trials by Age and Condition.....	51
8. Mean Numbers (and Standard Deviations) of Correct Choices of Both Identities During the Memory Trials by Age and Condition.....	52
9. Parental Ratings (and Standard Deviations) of Children's Home Behaviors.....	53

## CHAPTER 1

### INTRODUCTION

Pretend play is the ability to escape the constraints of reality and visit different worlds and possibilities that may seem distant to adults. Remarkably, young children seem to accept the terms of this situation with little question. One of the key elements in pretend play is the capacity to use substitution in pretend scenarios. Substitution refers to an action where the pretender is able to use an object, for example a popsicle stick, and act as if it is something else, e.g., a spoon to feed him or herself or a doll. This ability has been demonstrated as early as eighteen months of age (Harris & Kavanaugh 1993) and becomes more complex and integrated over the next several years. The development of pretend play is an interesting issue in itself; however, pretend play has also been hypothesized to be an important element in children's development of creativity and cognitive abilities and has therefore become of additional interest to researchers. The majority of research on pretense has focused on the production or imitation of these activities by the child, and less on his or her comprehension or understanding of these actions. This emphasis is changing, however, as researchers have discovered that through production of pretend play, comprehension may also be assessed. Thus research on children's comprehension of pretense has provided another window into the thinking processes displayed by young children as well as into their understanding of real and imaginary events and the mental structures required to make the distinction. Although research has begun in this area, there are still many questions to be answered.

## A. The Development of Pretend Play

Many developmental changes are associated with pretend play. The different stages associated with the changing structure of pretend play and the eventual ability to engage in object substitution are summarized in this section, based mainly on work done by McCune-Nicolich and Fenson (1984). In general though, the beginnings of symbolic play can be observed during Piaget's sensorimotor period. By about 13 months of age, children can substitute objects in pretense play highly similar to the referent that the child is pretending it to be. For example, an empty cup may be used as a cup with tea in it. These actions are based on the child's own daily activities and comprise single actions involving only the child. Eventually, between 12-18 months of age, the child's activities become less centered on the self. McCune-Nicolich and Fenson (1984) separate this stage into two components; the first consists of object- and other-directed acts and the second other-directed active play, that is, play involving other characters as active agents. Other-directed acts (e.g., pretending to brush a doll or a mother's hair) can be observed before object-directed acts (e.g., stirring a spoon in a cup). However, by 19–24 months of age these two kinds of actions are reported to occur equally often in pretend play (Fenson & Ramsay 1980). As the child approaches 24-30 months of age, other-directed active play emerges. For example, the child will place a hairbrush in a doll's hand in order for the doll to use it (Corrigan 1982). In addition to the actions associated with the characters, at times emotions will sometimes be applied to these "playmates," providing evidence for the child's understanding of the perceptions and roles of others in the pretend episodes.

Parallel to these stages is the development of integrated pretend play, in which a solitary act (e.g., brushing the doll's hair) becomes part of a storyline employed within a larger context (e.g., the doll is getting ready to go to school, so she has to brush her hair, wash her face etc.). Although children at 19 months of age display "single scheme" actions during their play (e.g., the same action used on two different characters) and decontextualization (e.g., a greater ability to use a wider range of substitute objects) appears, it is not until 24 months of age that the child produces multischeme actions (McCune-Nicolich & Fenson 1984) and therefore integrated pretend play. Multischeme actions include successive actions (e.g., putting a doll on a pillow and covering it with a blanket), and eventually planning of pretend episodes.

As already noted, the child's first demonstration of object substitution consists of using objects that have a general similarity to their referents in both form and function. For example, a child will initially use an empty container, but not a piece of paper as a teacup (Jackowitz & Watson 1980, Fenson & Ramsay 1980). One set of observations that at first glance seems to contradict this initial limitation comes from an experiment done by Mandler and McDonough with 14-month-olds (Mandler 2000). In this study infants were shown a doll drinking out of a teacup. When these infants were given the doll, along with the choice of a coffee mug or a frying pan, they were just as likely to use the frying pan as the coffee mug to give the doll a drink. However, these results were interpreted by Mandler (2000) as an overgeneralization of the "container properties" of the frying pan, rather than as a symbolic event. Children up to 20 months of age display overgeneralization of properties of objects. However, Mandler (2000) found these errors to be domain restricted. In other words, the child was able to incorporate certain

properties of the frying pan in their play behavior, such as it can hold liquid, which allowed it to be used in ways that fit into the “container” domain but not in other ways. For example, the child did not use a frying pan to brush a doll’s hair. These results demonstrate that children can use substitute objects with an atypical function in their play activity. Moreover, Mandler (2000) theorizes the child is not substituting the frying pan for a cup; instead he or she actually thinks the pan, because it holds liquid, is acceptable for giving a drink to the doll. In other words, the representational abilities involved in object substitution later in development may not have been required here; instead the child’s choice could have derived from his or her knowledge (or lack of knowledge) of objects and their acceptable uses.

By 19 months, as they gain more experience with a particular object’s function, children are less likely to use the object as a substitute object if it has a different function from the intended play function. However, they do begin to use items with ambiguous identities. For example, they can pretend that a square block, which often functions in multiple ways during a child’s play activities, is a bar of soap because the block does not have a salient identity that interferes with its pretended identity. In other words, children do not need to ignore or modify information they have regarding the object in order to pretend it is something else. Nevertheless, these objects usually have a similar form or function to the object for which they are substituting (e.g., the square block is very similar in shape to a bar of soap) (Jackowitz & Watson 1980). After about three years of age children are able to engage in substitution involving items that have a salient function and do not necessarily share the form or function of the identity they are being substituted for (ex. they can use a shoe as a “telephone”) (Musatti & Mayer 1987).

## B. Cognitive Significance

Pretend play is both interesting and entertaining, but does it serve other functions for children? Children freely engage in play activities throughout their development, an activity that can provide a window into their thinking and understanding. Pretend play, more specifically, provides an opportunity for researchers to investigate the early emergence of certain cognitive abilities. There is some question as to what extent pretend play represents children's cognitive capabilities. Vygotsky (1978) commented that children could display certain cognitive behaviors earlier in their development with the aid of a more cognitively advanced play partner as seen in pretend play. On the other hand, Lillard (1993a) offers an opposing viewpoint, that although these children may be performing at greater cognitive levels than is seen when they are outside of the pretense activity, they do not truly understand the representations or mental states necessary for the task. Therefore, this level of pretend play would not demonstrate children's early abilities on understanding cognitive representations, but rather their understanding on the specific task they were given.

In an effort to address this concern, Golomb and Cornelius (1977) took four-year-old non-conservers and trained them with substitution tasks in pretend play after they had been tested on both a liquid and a solid conservation task. This training included acting on a substitute object (e.g., clay) in a way that conflicted with its real properties. For example, the experimenter initiated actions as if suggesting it was a "sausage." The children strongly objected to these actions, an indication that the children were not completely separating pretend from reality. The experimenter prompted the children to explain their objections. Children generally remarked that the

experimenter could not eat the “sausage” because “although they were pretending it was food, it was really clay.” The next day the non-conserving children were again given liquid and solid conservation tasks. This time they did significantly better on the conservation task and better than a control group that did not receive the pretend training. Golomb and Cornelius (1977) hypothesize that making the children describe the transformations and explaining that the experimenter is pretending the clay is sausage when in reality it is still clay, enabled them to extrapolate similar knowledge to the conservation task. Pretend play may enable the child to acknowledge the reversibility of objects in different settings. Although the child and experimenter could pretend the clay was a “sausage” they could recognize the duality of the object; reality and make believe. They could go back and forth between these identities to suit their play behaviors. In other words, even though items can be transformed (by using pretense in the case of the clay), realistically they do not change. By extension to the conservation task, even though water is placed in a different container and “altered” in appearance, the actual amount of water has not changed. The question still remains though, as to what this task actually demonstrates. If indeed children were capable of conserving earlier than is reported in previous research, pretend transformations seemed to allow the child to understand the task in their own terms, perhaps eliminating the constraints of reality that usually inhibit them from answering correctly. For example, in reality they assume that the bigger something appears, the bigger it is. Yet, during pretense anything is possible and this rule is allowed to be broken. Once this has occurred they are open to it occurring in reality and therefore perform better on the conservation task. Again, it is hard to distinguish if children are truly learning and transforming information from the

pretense activity to the conservation task, or if some other mechanism is at work here, enabling them to succeed at this task.

Perhaps an even more important role for pretense behavior in cognitive development can be found in the development of theory of mind. Theory of mind refers to an individual's ability to understand another person's point of view. In children this ability does not seem to be established until about four years of age (Flavell & Miller 1998). According to Leslie (1987), pretend play provides a starting point for this ability. Around 24 months of age, other-directed active play, which includes the ability of a child to recognize emotional attributes of pretend play partners from his or her own point of view, begins to appear. Leslie (1987) believes this form of pretense may be a precursor to understanding the mental state of others. Pretend play allows the child to think about how imaginary events may affect others (e.g., that if the child took away a toy from his or her doll "playmate," the doll would be sad). The child could resort to and extend this understanding to processing real events and eventually separate his or her own feelings and emotions from those of others.

### C. Theories of Object Substitution During Pretend Play

A role for pretend play in cognitive development seems quite counterintuitive. The child is assumed to acquire an understanding of how the world operates from experiencing the environment. The child must learn what categories objects belong to (e.g., a dog is an animal) and what characteristics objects possess (e.g., a dog has a tail). How then does the child abandon the restrictions on objects established by this understanding in order to use them as substitutes in pretense? Leslie (1987) proposed a

decoupling model to describe the mental processing the child engages in during pretense to explain his or her ability to engage in object substitution. Leslie (1987) suggests that children take their primary representation of an object (e.g., this is an empty cup) and make a copy of it for use in the pretend setting. This copy, now involving pretense (e.g., this empty cup has tea in it) can be tagged, so it will not interfere with the primary representation. Leslie (1987) claims that if children simply believed an object with a known identity could easily take another identity, “representational abuse” would occur. Representational abuse refers to overextension of the new identity into the child’s real life environment.

Harris and Kavanaugh (1993) note several limitations to Leslie’s (1987) decoupling model. Specifically, they point out the need for a deletion process associated with substitute objects during pretense. If a child pretends a banana is a phone for example, he or she must not only make a copy of the banana to use in the pretend situation, but also must disregard characteristics of the banana that could interfere with the new identity assigned to it (e.g., the yellow color of a banana since a phone is usually not yellow). Harris and Kavanaugh (1993) also point out that Leslie’s (1987) theory is centered on the object used in pretend play instead of the pretend episode itself. In contrast, Harris and Kavanaugh (1993) emphasize the pretend episode, and a flagging mechanism to differentiate the episode from reality. Harris and Kavanaugh (1993) speculate that the pretend episode prescribes a directionality in terms of how a child uses substitute objects in their pretend play. In other words, the pretend episodes encourage the child to use some objects, rather than others as substitutes. It may be easier for a child to realize the need for a certain object during a pretend episode (e.g., the need for a

cup if they are pretending to have a tea party) and to look for an object that fills this need (e.g., a seashell), rather than choosing the object and placing an identity upon it (e.g., if a shell in front of him or her would help the child using it as a cup).

Lillard (1993a) addresses some of these concerns with her theory on object substitution. Lillard (1993a) theorizes that object substitution, unlike Leslie's (1987) decoupled model, does not involve a link between the real identity of an object with its pretend identity in a single representation (e.g., "I pretend the banana 'is a comb'.") and therefore, there is no need for a deletion process. Instead the identities are maintained at different cognitive levels. Reality lays the foundation for the children's pretense activities and the identities they apply to the objects they use during this play activity. Lillard (1993a) argues that either through action or mental representations, the real identity of an object (e.g., a square block) may be "cognitively backgrounded" in comparison to the pretend identity (e.g., a sandwich). In other words, the real identity may influence or interfere with actions during object substitution. The child is aware of both the real and pretend identities; they are, however, on different cognitive levels (Amsel, Bobadilla, Coch & Remy 1996). Lillard (1993a) compares this to driving while having a conversation. Implicit knowledge, like driving a car after many years, permits an individual to be cognitively free to carry on a conversation though the fact of driving is always present at some level in the mind. In other words, a child could pretend that a block is a cookie yet maintain the knowledge that it is truly a block in the background, and, therefore, not make the mistake of trying to eat it. Lillard's (1993a) theory provides a clear division of real versus pretend identities, and explains why children are unlikely to confuse the functions of the object in these different contexts.

Perner (1991) has offered still another alternative theory of pretend play. His theory outlines an even greater distinction between reality and pretense than Lillard's (1993a). Perner (1991) proposes that children understand the difference between pretense and reality. They knowingly control which mental state they are engaged in at the moment and they also can switch back and forth between the mental states. Perner's theory differs from other theories, particularly with respect to his views on symbolism in pretense. Perner (1991) believes that while the child is engaged in pretense, he or she treats the substituted object with a new identity, not as a symbol for its referent. For example, a child using a popsicle as a toothbrush is treating the popsicle "as if" it were a toothbrush, not as a symbol for a toothbrush. He argues that a true understanding of symbolization means that the substitute object would have certain characteristics of the referent (e.g., bristles of a toothbrush) and would be used by the child with these characteristics in mind even though not actually present on the object. Perner (1991) believes children at a young age do not demonstrate this ability. However, Harris and Kavanaugh (1993) argue against this interpretation based on their work done with two-year-olds. Already at this age, for example, children react to a pretend spill as if the surface would now be wet. They act as if the pretend "container" had liquid in it and when spilled would therefore have appropriate, specific consequences. Thus, during object substitution, a child, with little hesitation, seems willing to attach the characteristics of the real reference to the substitute and will even engage in an appropriate action such as pretending to wipe up the spill. For Harris and Kavanaugh (1993), these actions are evidence of symbolic abilities in young children.

Another criticism of Perner's position offered by Harris and Kavanaugh (1993) is that at any moment in a pretend scenario children are aware of the realistic constraints on the objects they are using, a conclusion also reached by Lillard (1993a). The work of Golomb and Cornelius (1977) showing children did not allow the experimenter to eat the clay sausage supports such a position. Furthermore, neither Perner (1991), Lillard (1993a) nor Leslie (1987) discuss in any real detail a memory component to the act of object substitution. How do children store this pretend episode in memory? Can it be accessed later or is the memory lost once a pretend scenario is over?

To address some of these issues concerning symbolism, mental states, and memory, Harris and Kavanaugh (1993) presented objects with ambiguous identities (e.g., a popsicle stick) to 2 and 2.5-year-olds in two different scenarios (e.g., a dinner or bedtime scenario). They asked the children to use the object according to an identity given to it by the experimenter in each of the scenarios. For example, the experimenter would hand the child a popsicle stick in the first scenario and say; "Show me what Teddy does with his spoon," and in the second scenario "Show me what Teddy does with his brush." Harris and Kavanaugh (1993) purposely did not use action words like "feed" when requesting the action from the child. This was to ensure that the child was not using verbal cues as the basis for acting out his or her understanding of what was being asked. They found that 2.5-year-olds were able to use different identities for the substitute object in the two different scenarios. Children this age did not overextend the identity given to the popsicle in the first scenario to that popsicle in the second scenario. In contrast, two-year-olds produced substantially fewer pretend actions than the 2.5-year-olds. Moreover, when they did not receive credit for successful use of a substituted

object, they either failed to act out the identity with the substitute object or used it in a literal fashion unrelated to the experimenter's request (e.g., the child placed the teddy on the block instead of "feeding teddy" the block).

Harris and Kavanaugh (1993) attribute the ability of the 2.5-year-olds to engage in these different object substitutions in the two scenarios to the acquisition of a "flagging mechanism." The child identifies the scenario as pretend, and attaches a flag to the substitute object with certain stipulations during a given scenario. For example, a child may have generated a flag indicating that, "During this scenario, this cup contains pretend tea." This flagging process allows the child to incorporate reality and pretense into a play episode. The child uses separate flags for an object in each of the different scenarios, allowing him or her to keep track of each identity in the various pretend episodes. According to Harris and Kavanaugh (p. 63, 1993), when the flagging mechanism is applied; "... children attach a flag neither to a mental representation of a specific prop nor to the mental representation of a prop's category but simply to a mental representation of the current pretend episode."

These flags may be edited during an episode as well. If a cup with "pretend" tea in it is spilled, the original representation will be altered to reflect this change and will now represent a "pretend" empty cup. This editing allows for changes in the pretend setting without causing confusion for the child in how he or she represents each object in other contexts. These flags are stored in the child's representation of a specific scenario and prevent the child from engaging in, what Leslie (1987) called "representational abuse." Overextension of the pretend substitutions is avoided because flagged identities and the objects associated with them in each scenario are put aside and no longer read

after the completion of a pretend scenario. The flags are not deleted from memory, but are simply placed in long-term storage for access later. Thus, Harris and Kavanaugh (1993) believe if the child is reintroduced to the same pretend scenario, the flags will be reinstated for use once again, a prediction they never tested. They also conclude that their work is the first of its kind to demonstrate children keeping track of multiple substitutions.

## CHAPTER 2

### STUDY DESIGN

Harris and Kavanaugh (1993) found that children at 2.5 years of age could represent two identities for the same object, between scenarios, on the basis of “flagging.” Through this flagging mechanism the child could ignore the previous identity applied to the substitute object, establish a new identity for it, and use it in the second scenario without confusion. Yet, one anecdotal observation has offered limited support to the view that children can pretend that a substitute object can have two identities within the same scenario. Dunn and Dale (1984) described a dialogue between a two-year-old and his older sibling. During a pretend episode the older child tells the two-year-old that a cushion is at first a gate and later a tunnel. The younger child seemed willing to attribute one particular object (the cushion) with two identities (as a gate, then as a tunnel), but within the given scenario, not just between two pretend scenarios. However, it is important to note that in this particular play episode the child could act out the instructions from his older sibling with little demand for comprehension of object substitution. That is, the two identities attributed to the cushion, a tunnel and a gate, share similar acts involving locomotion; both are used to move through. In other words, the child did not necessarily have to understand multiple object substitutions in order to engage in the activity. These findings, however, highlight the need to follow up Harris and Kavanaugh’s (1993) original research and investigate the role that flagging different scenarios plays in permitting object substitution.

In this experiment, in one condition 2.5 and 3-year-old children were asked to engage in object substitution involving two different scenarios using the same objects, a

condition designed to replicate Harris and Kavanaugh (1993). In addition, a condition was included to determine whether children these ages could use substitute objects in pretend play when the objects had two identities *within* the scenario. Would children of this age be capable of keeping track of substitute objects when they are unable to “flag” the given identities by separate scenarios?

In their original work Harris and Kavanaugh (1993) included a very wide range of age groups. For example, younger two-year-olds were between 24-31 months of age. In the present study the age range for our younger children was narrowed between 29-31 months of age. Children in this age group were included in both Between-Scenario and Within-Scenario conditions. Because 2.5-year-olds are assumed by Harris and Kavanaugh (1993) to be restricted by the “flagging mechanism” during pretense, they were not expected to be successful in the Within-Scenario condition. Thus, 3-year-olds were also included in the present experiment. At this age children begin to engage in object substitution spontaneously and are no longer limited by actual identities of objects; for example, they can pretend a shoe is a car (Musatti & Mayer 1987). Given their increased flexibility in engaging in object substitution, children three years of age should be able to keep track of an object given multiple identities even within a scenario. If so, their behavior would suggest an advance in the understanding of object substitution relative to the 2.5-year-olds.

Harris and Kavanaugh (1993) also suggested that if given the opportunity to re-establish a pretense situation, children would be able to retrieve the flagged memory and act accordingly with the substituted objects. However, they never tested this claim. In order to shed light on this possibility the current study includes a memory phase. Gopnik

and Slaughter (1991) touched upon the issue of memory in some research involving theory of mind that included a pretend task. Gopnik and Slaughter (1991) gave children a stick and told them to use it as a spoon when the children were asked to pretend with a bowl. They then changed the context of the play scenario by bringing the children to a different table where a magician's hat lay and where the children were told the stick was now a magic wand. When questioned later, neither 3- nor 4-year-olds had difficulty in remembering either the first or second identity assigned to the stick. The 3-year-olds demonstrated an ability to keep track of and remember multiple identities for a single object used during object substitution in a Between-Scenario condition.

Since 3-year-olds, according to Gopnik and Slaughter (1991) display an ability to remember the two object substitutions, they serve as an important control against which to compare the 2.5-year-olds performances in the present study. No studies addressing memory abilities in pretense have been done with this younger age group. The present study's memory trials differed from those carried out by Gopnik and Slaughter (1991) in that the participants were not required to verbally recall the identities of the objects, but rather, had to choose among various objects as to how they were used in the initial pretense activity. For example, in Gopnik and Slaughter's (1991) study children's memory was assessed by their response to the question; "When I first asked you, before we moved over here, what did you pretend the stick was then? Did you pretend it was a spoon or as a wand?" In the present study we assessed memory by verbally instructing the child to select the object, which had been used in a specific way in a previous scenario.

Each child was asked to choose among the substitute objects on the basis of their memory for the identities assigned to each object. Evidence of memory, especially in the Between-Scenario condition compared to the Within-Scenario condition, would provide further support for the importance of a flagging mechanism in children's pretense activity. If children perform better in the Between-Scenario condition it would suggest that their memory for an object's use depends on the flagging associated with scenarios and is not linked directly to the object.

## CHAPTER 3

### METHODS

#### A. Participants

Participants were 51 children from the community surrounding the University of Massachusetts at Amherst. Three children were excluded from the analyses for failing to complete the experiment, when they refused to participate in the pretend activity. The remaining children included twenty-four 2.5-year-olds (12 females, 12 males, age range = 29-31 months) and twenty-four 3-year-olds (14 females, 10 males, age range = 35-38 months). The children's names were obtained from birth records provided by the Commonwealth of Massachusetts. The parents were contacted initially by letter; a phone call then followed to recruit participants.

#### B. Materials

Testing took place in a research suite on the campus of the University of Massachusetts. Two different window scenes served as backdrops for the two scenarios, one suggesting daytime, the other nighttime. The scenes were displayed on two different adjacent walls of a 4.8 m x 4 m x 2.5 m room. A small wooden chair was located in front of each backdrop.

The materials included a teddy bear named "Teddy" and a bowl, a pitcher and teacup used during the warm-up phase. The four objects that were used for the object substitution activity were a yellow block (4 x 4 cm square), a flat blue board (15 x 6 cm), a white piece of paper (12 x 9 cm rectangle), and a red cylinder block (6.5 x 4 cm). A video camera was used to record the children's behaviors.

### C. Procedure

The experiment consisted of four phases. Each child engaged in a warm-up activity, an experimental activity, and a memory trial. These procedures were followed by a free play phase. In addition, the parent completed a survey while the child was engaged in the free play phase.

#### a. Warm-up phase

The warm-up phase included a pitcher and a teacup, objects that were not used in the later experimental phase to avoid modeling or interference for the child. The child was placed in the middle of the room. He or she was told that we were going to be “pretending” and was asked to pour some “pretend” tea from the teapot into an empty teacup. The purpose of this warm-up phase was to introduce the concept of “pretend” to the child as well as to familiarize him or her with a play activity before testing began.

#### b. Experimental phase

Children were assigned randomly to one of two conditions in the experimental phase. The order of presenting the two scenarios (dinner or bedtime) in each condition was counterbalanced. In each condition the child was seated on the floor facing one of two chairs. Each of the chairs was located in front of one of the two backdrops signifying the dinner or bedtime scenario. “Teddy” was seated in the chair relevant to the scenario being acted out and was moved to the second chair when the second scenario began.

Before beginning the first of the two pretend scenarios, the child was shown all four objects and told that there was only one of each, to reduce the possibility that the

child might think different exemplars of the same objects were being used with the two scenarios. After showing the child each object, they were placed out of view and handed to the child one at a time during the experimental phase.

In the Between-Scenario condition, the task was a modified version of one employed by Harris and Kavanaugh (1993, experiments 3 and 4). In their work only three objects were used for substitution in each of the pretend scenarios. However, in the present study four objects were used. The number was increased in order to provide a more systematic comparison of object substitution in the two different conditions. In the Between-Scenario condition each of the four objects was given a different identity in each of the two scenarios presented to the child. For the Within-Scenario condition two of the four objects each had two different identities within the first scenario and the remaining two objects had two different identities within the second scenario. Table 1 summarizes the object substitutions used in the Between-Scenario and Within-Scenario conditions.

The instructions and procedure for the Between-Scenario condition were as follows:

*Dinner scenario:* “OK. Now it’s time for Teddy to go into the kitchen and have his dinner.”

Episode 1: “Teddy is having his dinner. This is Teddy’s sandwich (hand child yellow block). Show me what Teddy does with his sandwich.”

Episode 2: “Teddy is having his ice cream. This is Teddy’s spoon (hand child blue board with the bowl). Show me what Teddy does with his spoon.”

Episode 3: “Teddy is messy. This is Teddy’s napkin (hand child white piece of paper). Show me what Teddy does with his napkin.”

\*\*Episode 4: “Teddy likes sprinkles/chocolate syrup with his ice cream. Here is a can of sprinkles/chocolate syrup (hand child red cylinder block). Show me what Teddy does with his sprinkles/chocolate syrup.”

\*\* Although in piloting the term “sprinkles” did not seem to create confusion for the children, during the present study, some children seemed confused when asked to use the “sprinkles.” Therefore, before the start of the experimental phase it was necessary to ask the parent what their child was more likely to comprehend, sprinkles or chocolate syrup. The “chocolate syrup” identity was used interchangeably with the “sprinkles” identity based on the parent’s judgment of their children’s understanding of the terms.

After completion of the dinner activity (if that scenario was presented first), the child and experimenter moved to the backdrop depicting the nighttime scene to engage in the activity associated with that scenario.

*Bedtime scenario:* “OK. Now it’s time for Teddy to go into the bathroom and get ready for bed.”

Episode 1: “Teddy is having a bath. This is Teddy’s soap (hand child square yellow block). Show me what Teddy does with his soap.”

Episode 2: “Teddy is getting ready for bed. This is Teddy’s toothbrush (hand child blue board). Show me what Teddy does with his toothbrush.”

Episode 3: “Teddy is ready to go to bed now: “This is Teddy’s pillow (hand child white piece of paper). Show me what Teddy does with his pillow.”

Episode 4: Teddy likes a glass of water before he goes to sleep. This is Teddy’s glass of water (hand child red cylinder block). Show me what Teddy does with his water.”

The child was praised for his or her pretend activities.

For the Within-Scenario Condition, the presentation was altered slightly. This was necessary to balance the objects and identities to avoid giving the child the same object on two consecutive trials. For example, in the Between-Scenario condition if the “can of sprinkles/chocolate syrup” (real object = red cylinder) was presented before the “napkin” (white piece of paper) in the dinner scenario, in the Within-Scenario dinner scenario the blue flat board would be presented on two trials in a row (“spoon” and “napkin”). The instructions and procedure were as follows:

*Dinner scenario:* “OK. Now it’s time for Teddy to go into the kitchen and have his dinner.”

Episode 1: “Teddy is having his dinner. This is Teddy’s sandwich (hand child square yellow block). Show me what Teddy does with his sandwich.”

Episode 2: “Teddy is having his ice cream. This is Teddy’s spoon (hand child blue board with the bowl). Show me what Teddy does with his spoon.”

Episode 3: “Teddy wants sprinkles/chocolate syrup with his ice cream. Here is a can of sprinkles/chocolate syrup (hand child yellow square block). Show me what Teddy does with the sprinkles/chocolate syrup.

Episode 4: “Teddy is messy. This is Teddy’s napkin (hand child blue board). Show me what Teddy does with his napkin.

After completion of the dinner activity (if that scenario was presented first), the child and experimenter moved to the backdrop depicting the nighttime scene to engage in the activity associated with that scenario.

*Bedtime scenario:* “OK. Now it’s time for Teddy to go into the bathroom and get ready for bed.”

Episode 1: “Teddy is having a bath. This is Teddy’s soap (hand child white paper). Show me what Teddy does with his soap.”

Episode 2: “Teddy is getting ready for bed. This is Teddy’s toothbrush (hand child red cylinder block). Show me what Teddy does with his toothbrush.”

Episode 3: “Teddy is ready to go to bed now. This is Teddy’s pillow (hand child white paper). Show me what Teddy does with his pillow.”

Episode 4: Teddy likes a glass of water before he goes to sleep. This is Teddy’s glass of water (hand child red cylinder block). Show me what Teddy does with his water.”

The child was praised for his or her pretend activities.

### c. Memory phase

The memory phase began after each child had completed both scenarios in the experimental phase. The child returned to the original scenario and was told: “You did such a good job the first time, but he still needs your help.” The four objects used during the experimental phase were placed on the floor beside the child. Since the child needed to select the object to be used to complete each episode in the memory phase, the child was told the following:

#### *Dinner Scenario*

Episode 1: “OK. Now it is time for Teddy to have dinner again. I think Teddy wants a sandwich. Show me what Teddy does with his sandwich.”

Episode 2: “Teddy is having his ice cream now. Show me what Teddy does with his spoon.”

Episode 3: “Now Teddy needs a napkin because he is all messy. Show me what Teddy does with his napkin”

Episode 4: “Remember Teddy likes sprinkles/chocolate syrup with his ice cream. Show me what Teddy does with the can of sprinkles/chocolate syrup.”

#### *Bedtime Scenario*

Episode 1: “OK. Now it is time for Teddy to get ready for bed. He wants to get clean. Show me what Teddy does with his soap.”

Episode 2: “Time for the toothbrush. Show me what Teddy does with his toothbrush.”

Episode 3: “Teddy wants his pillow. Show me what Teddy does with his

pillow.”

Episode 4: “Teddy is thirsty again. Show me what Teddy does with his water.”

The child was praised for each pretend activity.

#### d. Free-play phase

A free-play phase occurred after the memory trials had been completed. In this portion of the study, the child was shown “Teddy” and the four objects used previously in the experiment and was encouraged to play with the materials in whatever way he or she chose. The experimenter left the room for the 5 minute free-play phase, but the video camera continued to record. The parent, who remained with the child, was instructed to respond in an appropriate manner if the child approached her or him during free play. However, the parent was asked not to initiate any play behavior with the child.

During the time the child was engaged in the free play activity, the parent completed a survey consisting of questions concerning the child’s play activities at home, whether the child attended daycare or had siblings, etc. The survey questions parents completed can be seen in the Appendix.

#### D. Scoring & Analyses of Data

The videotapes depicting the child’s pretend activities were scored after completion of the task. The camera was positioned in the corner of the room, at the child’s level, to be able to record the play activity in front of both backdrops, as well as the child’s facial reactions.

During the experimental and memory phase of the experiment, the participant was credited with a correct response, an incorrect response, or no response, concerning the use of the substitute object. During the experimental phase a correct response was scored when the child successfully acted upon the object in accordance with the identity it had been given. For example, for the statement, “Show me what Teddy does with his spoon” the child was correct if he or she used the spoon to exhibit “feeding” teddy. A descriptive summary of appropriate actions the child could initiate with each substitute object can be found in Table 2. A correct response during the memory trials was scored when the child successfully selected the appropriate substitute object based on its assigned identity. The child was also scored in terms of using the substitute object in the appropriate manor, regardless of which item had been selected.

The child could use four substitute objects in an appropriate manor during each of the scenarios in the experimental phase. There were also four opportunities to select the appropriate object in the memory phase of the experiment during each of the scenarios and to perform with the substitute object in the memory phase. In addition, a measure was obtained based on the number of times the child used the four substitute objects correctly in both scenarios.

Reliability was assessed by having a second person view the videotapes of the children’s pretend activities. The second observer viewed 60% of the experimental sessions. Percentage agreement between the main experimenter and the second observer (calculated as  $\frac{\text{agreements}}{\text{agreements} + \text{disagreements}}$ ) was 99% for the experimental phase, 94% in the memory phase where the child selected the appropriate object and

96% in the memory phase when the child performed an action with the substitute object that they had selected.

## CHAPTER 4

### RESULTS

#### A. Warm-up

Children had little difficulty engaging in the pretense activity during the warm-up phase. All children seemed to accept shifting from reality to pretense with ease, using the pitcher to pour pretend “liquid” into a teacup.

#### B. Experimental Trials

Preliminary analyses were carried out to examine the effect of gender and scenario order on performance using an ANOVA. There were no significant effects; therefore, the data were collapsed over these factors. The mean number of correct responses for each age group for the dinner and bedtime scenario can be seen in Table 3. Both age groups performed well overall. A “no” response, where the children did not respond when asked to demonstrate an action with the object handed to them, occurred in only 9 out of 192 experimental trials for the 2.5-year-olds and 5 out of 192 experimental trials for the 3-year-olds.

The results shown in Table 3 indicate that despite the relatively good performance by both age groups, 3-year-olds did better than 2.5-year-olds. A 2 (age) x 2 (condition) ANOVA demonstrated a main effect for age ( $F(1, 44) = 4.09, p < .05$ ). Three-year-olds were able to use the objects appropriately significantly more frequently than the 2.5-year-olds. No significant condition or age x condition interaction was found.

The mean frequency with which the two age groups used the four substitute objects correctly in both scenarios is shown in Table 4. As can be seen in this table, 3-

year-olds were better at using a single object to represent two different identities during the experiment than 2.5-year-olds. A 2 (age) x 2 (condition) ANOVA carried out on these data revealed a main effect only for age ( $F(1, 44) = 4.03, p = .024$ ). Once again no significant interaction was found between age and condition. However, although 3-year-olds were able to use the substitute object both ways well in either the Within- or Between-Scenario condition, 2.5-year-olds had more difficulty doing so in the Within-Scenario condition. In fact, a post-hoc t-test performed on the results obtained from the two age groups in the Within-Scenario condition revealed that 3-year-olds performed significantly better than the 2.5-year-olds ( $t = -2.64, p = .015$ ). A closer examination of the performance with the four objects revealed that in the Within-Scenario condition, seven out of the twelve 2.5-year-olds were unsuccessful in using the 'yellow block' to demonstrate the "sprinkle/chocolate syrup" action and five out of twelve of the 2.5-year-olds were unsuccessful in using the 'white paper' to demonstrate the "soap" action. These unsuccessful trials by the 2.5-year-olds contributed to the age difference between the Between- and Within-Scenario conditions. Two-and-a-half-year-olds in the Within-Scenario condition either perseverated with the object (e.g., when presented with the yellow block they used it as they had the blue board on the immediately preceding trial (ex. as a spoon), or they used the same yellow block as they had used it before (ex. as a sandwich)). On the other hand, errors on the "soap" trials in the Within-Scenario condition were most commonly "no response" perhaps because it was not preceded by any other activity in that scenario.

A major goal of the present study was to determine whether children who had been given an initial identity for an object would have difficulty in then using it in a

second way, particularly if the second identity had to be imposed within the same scenario. To investigate this possibility, the means of the children's performance on the initial use of the object presented, was compared to their performance on the second presentation of that object in both conditions. However, as can be seen Table 5, children had little difficulty engaging in a second activity using the same substitute object. In both the Between- and Within-Scenario conditions the first time the child used an object did not seem to interfere with the second time they were required to use the same object. Paired comparison t-tests for first versus second presentations revealed no significant effect in either the Between-Scenario ( $t = -.9, p > .05$ ) or the Within-Scenario condition ( $t = -1.14, p > .05$ ).

### C. Memory Trials

Once again, in an ANOVA, no significant effects for gender or the order of presentation of the scenarios were found and therefore the data were collapsed over these conditions for further analyses of performance on the memory trials. Table 6 shows the mean number of times the child correctly selected the substitute object on memory trials that had previously been assigned that identity during the experimental trials. Although performance by the two age groups in both conditions was somewhat lower on the memory trials when they were asked to select the correct substitute object than on the experimental trials when asked to demonstrate an appropriate activity with the substitute object, children, nevertheless, did quite well in selecting the correct objects to use in each scenario. Performance for each age group and condition was above chance (2.5-year-olds in the Between-Scenario condition  $t = 8.67, p < .01$ , 2.5-year-olds

in the Within-Scenario condition  $t = 7.72$ ,  $p < .01$ , 3-year-olds in the Between-Scenario condition  $t = 11.29$ ,  $p < .01$ , 3-year-olds in the Within-Scenario condition  $t = 9.38$ ,  $p < .01$ ). However, the results shown in Table 6 also indicate that both 2.5- and 3-year-olds are performing less well in the Within-Scenario condition than in the Between-Scenario condition during the memory trials. A 2 (age)  $\times$  2 (condition) ANOVA revealed a main effect of condition ( $F(1, 44) = 11.9$ ,  $p = .001$ ) and no significant effect for age or interaction between age and condition

The overall mean for using an object in an appropriate way during the memory trials regardless of whether it was the correct object based on its assignment in the experimental trials, was 7.25. This level of performance is very similar to the level exhibited during the experimental trials. The means for each age group and condition can be seen in Table 7. The 3-year-olds performed slightly better than 2.5-year-olds in their choice of action after they had selected an object to use. A 2 (age)  $\times$  2 (condition) ANOVA revealed a main effect for age ( $F(1, 44) = 4.3$ ,  $p = .045$ ) but no significant effect for condition or significant interaction between age and condition. Neither age group appeared to have difficulty understanding what action they needed to accomplish during the memory trial.

Table 8 shows the mean frequency for correctly choosing an object on the basis of both identities given to it during the experimental phase. Children were more likely to choose the same substitute object both times if they were in the Between-Scenario condition than if they were in the Within-Scenario condition. In other words, if a child was in the Between-Scenario condition, they were more likely to choose the yellow block once in the dinner and once in the bedtime scenario correctly, than if the child was

in the Within-Scenario condition where it was necessary to choose the yellow block twice in the same scenario. A 2 (age) x 2 (condition) ANOVA revealed a main effect for condition ( $F(1, 44) = 11.49, p = .001$ ). Neither the main effect for age nor the interaction between age and condition was significant. Further investigation of the results indicated that children in the Within-Scenario condition had little difficulty selecting the correct object to use when it was the first object assignment, but had greater difficulty when it was necessary to select the substitute object in the second way it had been used during the experimental trials ( $t = 2.57, p < .02$ ). On the other hand, no significant difference was found in the Between-Scenario condition ( $t = -.9, p > .05$ ).

#### D. Free Play

Free play provided a window for the experimenter to observe how the children interpreted the events of the experiment after it had concluded and to see if any of the identities persisted in their play behavior. If children incorporated aspects of the experiment into their own play activities, this would serve to indicate that they were not only immersed in the act of pretense, but also were continuing to accept the identities placed upon the substitute objects by the experimenter. Sixty-five percent of the children engaged in a free play activity for 2 to 5 minutes after the experiment had ended. Of these children 85% included aspects of the experiment in their free play activity. This activity included feeding and putting the bear to bed, using the objects as the identities given to them by the experimenter (e.g., the child picked up the white paper and placed the teddy bear on top of it as a pillow), etc.. Only one identity was predominantly chosen for each object during the free play episode; children rarely switched back and

forth in applying both identities that had been given to a particular object during the experiment while engaged in free play.

Children were more likely to engage in the free play activity if they had just completed the Between-Scenario condition (83%) compared to the Within-Scenario condition (48%) ( $F(1, 44) = 6.61, p = .014$ ). This may help to account for the observation that only one identity was associated with a particular object during the free play phase. Overall, children readily engaged in the free play activity and incorporated aspects of the study into their play behavior.

#### E. Survey Responses

Correlational analyses were performed on the survey responses and the findings obtained in the experimental and memory phases of the study. Table 9 reflects the minimal amount of variation of parental responses on questions concerned with the amount of play, specifically pretend play and television viewing. These responses did not reveal significant correlations between the amount of time engaged in these kinds of activities and performance by the children, except for parental interaction during pretense and children's correct usage of the substitute object during the experimental phase ( $r(48) = .31, p < .05$ ). The higher the rating a parent provided for the amount of time they spent pretending with their child at home, the better the child performed in the experimental phase. Because children performed so successfully in the experimental phase, the importance of this relationship is unclear. The survey responses also indicated that fifty-six percent of the children involved in the current study attended day care at

least two days a week. Sixty-nine percent had older siblings that lived with them at home.

## CHAPTER 5

### DISCUSSION

#### A. Object Substitution in Pretend Play

The present study was planned to further demonstrate the capabilities of children as young as 2.5 years of age to engage in object substitution and pretend play, and to test their memory for the substitute objects and activities, under two presentation conditions that might permit evaluation of four current perspectives on pretense.

During a pretense task involving object substitution, children of 2.5 and three years of age had little difficulty applying two different identities to an object, whether asked to do so within the same or a different scenario. For instance, children were quite capable of using the same piece of blue board as a spoon in the dinner scenario and then as a toothbrush in the bedtime scenario, as occurred in the Between-Scenario condition. Children were also able to use the piece of blue board as a napkin in the dinner scenario even after they previously used it as a spoon in the same dinner scenario as occurred in the Within-Scenario condition.

Three-year-olds did perform significantly better on the experimental trials than 2.5-year-olds. This was expected, considering the demands of the task. They may be more advanced than 2.5-year-olds in understanding verbal instructions and actions, as well as in maintaining attention to the task. Although the children in the present study were capable of using all of the objects, the 3-year-olds may have been better equipped

to give more than one identity to each substitute object. Nevertheless, 2.5-year-olds performed quite well.

Children had little difficulty applying two identities to the substitute objects in either of the scenarios during the experimental phase of the experiment except for the yellow block as a “can of sprinkles/chocolate syrup” in the dinner scenario and the white paper as a bar of “soap” during the bedtime scenario. This difficulty was demonstrated by 2.5-year-olds only, and in the Within-Scenario condition only. Three-year-olds did not have the same difficulty. Jackowitz and Watson (1980) found that at younger ages, the object the child is using needs to be similar in form or function to that for which it substitutes and cannot have a highly salient identity of its own. By three years of age, however, the child is less constrained by perceptual or functional relations between object substitutes and the one it replaces. The younger children in this experiment may have been influenced by this factor. The square yellow block may not have been as similar in form or function as the cylindrical red block to a can of sprinkles/chocolate syrup. The white paper also differed substantially from the prototypical idea of soap (e.g., it was not thick and it was bigger than traditional soap). Overall, children may have acted more appropriately during the Between-Scenario condition because more prototypical objects, were used. For example, the red cylinder was used as the “can of sprinkles/chocolate syrup” and the yellow block was used as the “bar of soap.” In the first case, the object was cylindrical and tall like a can; in the second, it was similar in size and shape to soap. A future study is necessary to test whether the interference of form or function played a role in children's difficulty with these objects and identities.

The results of the experimental phase do not support the “flagging mechanism” proposed by Harris and Kavanaugh (1993). According to their theory the scenario is flagged, e.g., “in this scenario this block is a sandwich.” Had this occurred with the first substitution, the children would have experienced confusion when it was necessary to place an additional identity on the same object in the Within-Scenario condition. Performance would be expected to decrease in this condition when using the second identity, since the substitute object was already linked to an initial identity within the scenario. However, this was not the finding.

Perner's (1991) theory that during pretense, children separate pretend and reality into two different mental states or representations, although plausible, does not seem to fully explain the current findings of this study either. Differentiating pretend and real identities would enable the children to apply multiple identities to an object, since they would not be constrained by each scenario as is the case according to Harris and Kavanaugh's (1993) flagging mechanism. By separating the two representations, the children could focus on the pretend identity, disregarding the real identity of the object. Therefore, they would have the freedom to use it as they desired during the pretense activity (ex. use multiple identities with the same object). However, one potential outcome if children ignored the substituted object's true identity, is the possibility of representational abuse, for example, children may have tried to “eat” the block themselves in the case of the “sandwich” or “wash” themselves with the piece of paper in the case of the “soap.” Children in the current experiment seemed to have little difficulty keeping track of the true identity of the substitute object during the pretense activity

when they were supposedly engaged in what Perner (1991) considers the pretend representation.

The results of the present study lend support to more flexible theories like those of Leslie's (1987) and Lillard's (1993a). Leslie's (1987) decoupler model provides an opportunity for the children to make a copy of the original object (the real identity) and to use it in a different identity (the pretend identity) with no interference from its original identity. Children use this method in order to avoid representational abuse. For example, as mentioned earlier, children could use a banana as a phone without thinking it is really a phone outside of the pretend context. Since the decoupler model is not focused on the scenario but on the object, it provides more room for the child to use multiple identities for a substitute object both within and between the scenarios than does Harris and Kavanaugh's (1993) flagging mechanism. An issue with Leslie's (1987) theory is whether the pretend identity and the real identity of the object are linked together during pretense. It is very possible that children could make multiple copies of the original identity of an object to be used during a pretend scenario, but Leslie (1987) does not indicate how children would keep track of these multiple copies. There is also a question of whether there is a deletion of the link between one identity and an object when a new link is presented or if the link between the real and the pretend identity simply becomes more complex (e.g. "this block is a "sandwich" or "soap"). In this case, children might have a problem keeping track of the duplicate copies or the complex statement used to identify the linked set of identities. The children in this study did not demonstrate any of these difficulties.

The results of the experimental phase appear to be readily explained by Lillard's (1993a) theory on "cognitive backgrounding." Past research has demonstrated that at any point during a pretend play episode children will rely on a realistic premise when necessary (e.g., children will not attempt to eat a block when pretending it is a cookie). The children in this study performed no differently. After being handed each substitute object they used it appropriately most of the time, even if this required them to use it twice during the same pretend scenario. The flexibility of separating the real versus pretend identities into different cognitive levels would allow the children to freely use the objects with several identities during the pretense activity without losing sight of the object's real identity. Lillard's (1993a) views on pretend play are not based on propositions or distinct separations as are found in the other theories. Children are aware of the necessary information related to the pretense activity (both real and pretend), but they are guided by this information, rather than restricted by it.

#### B. Memory for Object Substitutions in Pretend Play

The memory phase in this experiment was included to test Harris and Kavanaugh's (1993) proposal that a child would have little difficulty remembering the substitute object's identity after a particular task was complete if the proper cues were given; and to determine whether memory for object substitutions would be similar for both the Within- and Between-Scenario conditions. Each age group performed less well in the Within-Scenario condition than in the Between-Scenario condition, although participants still showed relatively good memory for object substitution even in the

Within-Scenario condition. We found they chose the correct object for the first assigned identity more often than for the second assigned identity. The difference between the conditions is interesting and provides limited support for Harris and Kavanaugh's (1993) position that flagging serves as a mechanism facilitating object substitution. There are three reasons why this may have occurred.

One possibility is that using one object as two different identities within the same scenario places a larger cognitive demand on the children of both age groups. They may be able to store only the first identity of the substitute object, even though we know they are quite capable of using the second identity when instructed to by the experimenter. As a consequence, when cued in the memory phase to select the substitute object they used earlier in that same scenario, children may simply find a suitable object for the function they need.

The second possibility is that children preferred to assign a more prototypical object to the identity they were using. When given more control over the episode in the memory task, merely asked to choose an object themselves, they may have ignored the previous identity the experimenter applied to it during the experimental trials if another object was considered more prototypical. For example, during the Within-Scenario condition many children chose the white piece of paper when asked for the “napkin” in the dinner scenario rather than the blue board that was the item actually used during the experimental phase as the “napkin.” Perhaps children chose this object because it more closely resembled an actual napkin than a flat, wooden, blue board. The children's preference to select objects more highly similar in form or function to the pretend

identity could make it difficult during the Within-Scenario condition to select an object multiple times. For example, the blue board may have been more similar in form to a “spoon” but not as similar to a “napkin” and the children's performance may have reflected this difference.

An explanation linked to Harris and Kavanaugh's (1993) flagging mechanism provides another possibility for explaining these results. Perhaps memory for object substitution is influenced by the context in which the substitution is implemented, even if the children's abilities to use the substitute object during the original play episodes are not. Rovee-Collier (2000) trained infants with a mobile above their cribs, which moved when they kicked. On the side of the crib, within the baby's view, she placed either a red or a blue drapery. When presented with the same mobile and the same color drapery, after a delay, the infants kicked their feet. This footkick response demonstrated that these infants retained the memory of the earlier training. However, if the drapery color was changed, a contextual difference, the infants did not kick their feet. The change in context interrupted the retrieval of the relevant information necessary in order to respond properly to the stimulus of the mobile. Rovee-Collier, Schechter, Shyi & Shields (1992) theorize that memory is ordered, with context as an important filtering mechanism for the rest of the system; “Thus, attention to potential retrieval cues is first filtered or screened at the level of the context, and perceptual identification of appropriate retrieval cues in the context permits attention to flow to the next level (the focal cue).” From this perspective, the contextual cues serve in much the same way as Harris and Kavanaugh's (1993) flagging mechanism and their views concerning a flagging mechanism's beneficial role during pretense. If children were flagging the pretend scenario, the scenario itself

would serve as the context upon which children base their memory representation. When two identities are assigned to a given substitute object during the same context (or scenario) the children may form a memory representation of the first relationship, but may have difficulties with the second one because the context has been assigned to the first association.

Many studies of state-dependent learning also relate to the analyzing of context effects in memory, demonstrated in object substitution during play. In many respects, the contexts in which pretense occurs is further illustrated by the findings showing the importance of state-dependent learning. State-dependent learning refers to the increased abilities of individuals to retain information in the same contexts in which they were given the initial information (Eich 2000). For example, Godden and Baddeley (1975) performed a study where participants learned a list of words either under water or on land. If these participants were tested after a delay within the same context (water or land) in which they had learned the words, they performed significantly better. A study completed by Bjork and Richardson-Klavehn (1989) proves especially relevant to our study. During their experimental phase, Bjork and Richardson-Klavehn (1989) asked the participants to memorize two separate lists of words, during two different study sessions. These words were presented either within the same context (physically the same place) for each of the two sessions, or between two different contexts (physically two different places) for each of the two sessions and all the participants were eventually tested in a neutral setting. They found that recall was significantly better when the participants memorized the lists in different contexts than when they memorized the same lists within the same context, even at different study sessions.

Bjork and Richardson-Klavehn's (1989) findings provide support for the importance of distinctive contexts for memory. It appears that the most optimal method of learning multiple items (or identities in our case) would be to do so using multiple contexts, as the children demonstrated in the Between-Scenario condition. Rovee-Collier (2000) demonstrated infants' use of context in memory, Bjork and Richardson-Klavehn (1989) did so with younger adults and Schramke and Bauer (1997) tested 60 - 80-year-olds and also found that context is strongly associated with recall abilities, to suggest that adults "are automatically storing and retrieving contextual information...(p 260)." Context remains an important aid in our memory processes throughout our lives and it seems quite plausible that children would find it more difficult to learn and store information about two identities being applied to one substitute object when different contexts (scenarios) are not available to provide them retrieval cues. Harris and Kavanaugh's (1993) flagging mechanism seems to offer an explanation similar to this viewpoint emphasizing the importance of state-dependent effects, as seen in the memory phase of the current study; Thus, this mechanism may provide an explanation for the children's behavior when remembering multiple identities within the same scenario.

In conclusion, Harris and Kavanaugh (1993) seemed to have overestimated the importance of a flagging mechanism for object substitution during pretense. However, the mechanism may provide some explanation for how these children retrieve the memories for the identities of the objects after they take part in the pretend scenarios. Both 2.5 and 3-year-olds were able to use substitute objects appropriately in two different identities, both between and within a given scenario. Even though their performance on the memory trials did decline, children were able to choose the

appropriate objects to use during a scenario the majority of the time in both scenarios, and had little difficulty using these substitute objects after they had chosen them.

Children of this age seem quite willing and capable of applying several identities to a substitute object during a pretend activity, though they may have some diminished memory for or capacity to choose the appropriate substitute object in more than one way. Future research goals include explaining the thinking that underlies the behavior of these children, not only in experimental settings, but also during pretense activities in general.

Table 1: Object Substitutions in the Between- and Within-Scenario Conditions

	Dinner Scenario	Bedtime Scenario
Between-Scenario		
Yellow Block	Sandwich	Soap
Flat Blue Board	Spoon	Toothbrush
White Paper	Napkin	Pillow
Red Cylinder	Can of Sprinkles/ Chocolate Syrup	Glass of Water
Within-Scenario		
Yellow Block	Sandwich Can of Sprinkles/ Chocolate Syrup	
Flat Blue Board	Spoon Napkin	
White Paper		Soap Pillow
Red Cylinder		Toothbrush Glass of Water

Table 2: Appropriate Actions for Substituted Objects in the Experimental and Memory Trials

<u>Dinner</u>	<u>Appropriate Actions</u>
Sandwich	Act as if “feeding” the bear, place the object near his mouth, make eating noises
Spoon	Same as above, but also incorporate “scooping” motion with “spoon”
Napkin	Act as if “cleaning” the bear, bring the object to the face and rub back and forth
Can of Sprinkles/Chocolate Syrup	Act as if “pouring” sprinkles into bowl, raising object above bowl and shaking
<u>Bedtime Identity</u>	<u>Appropriate Actions</u>
Soap	Act as if “washing” the bear, place object on and rub back and forth
Toothbrush	Act as if “brushing” the bear’s teeth, bring object to mouth and move back and forth
Pillow	Placing the bear’s head on top of the pillow as if going to “sleep”
Glass of Water	Bring the object to the bear’s mouth, make drinking no Noise

Table 3: Mean Numbers (and Standard Deviations) of Appropriate Actions on the Experimental Trials by Age and Condition

	Dinner	Bedtime	Total Correct Responses
2.5-year-olds			
Between-Scenario	3.6 (.79)	3.6 (.67)	7.2
Within-Scenario	3.3 (.75)	3.6 (.52)	6.9
3-year-olds			
Between-Scenario	3.6 (.51)	3.9 (.30)	7.5
Within-Scenario	3.8 (.60)	3.9 (.38)	7.7

Table 4: Mean Numbers (and Standard Deviations) of Correct Actions for Both Object Identities During Experimental Trials by Age and Condition

	<u>Between-Scenario</u>	<u>Within-Scenario</u>
2.5-year-olds	3.25 (1.10)	2.75 (.87)
3-year-olds	3.6 (.69)	3.6 (.77)

Table 5: Successful Mean Actions (and Standard Deviations) on the First vs. Second Presentations of the Substitute Objects During Experimental Trials by Age and Condition

	First Presentation	Second Presentation
2.5-year-olds		
Between-Scenario	3.4 (.79)	3.8 (.62)
Within-Scenario	3.6 (.52)	3.3 (.75)
3-year-olds		
Between-Scenario	3.8 (.41)	3.7 (.47)
Within-Scenario	3.9 (.38)	3.8 (.60)
Totals:	14.7	14.6

Table 6: Mean Numbers (and Standard Deviations) of Correct Object Choices on Memory Trials by Age and Condition

	Dinner	Bedtime	Total Correct Responses
2.5-year-olds			
Between-Scenario	3.3 (.65)	2.8 (1.42)	6.1
Within-Scenario	2.2 (.72)	2.9 (.99)	5.1
3-year-olds			
Between-Scenario	3.5 (.82)	3.2 (.98)	6.7
Within-Scenario	2.4 (.77)	2.7 (.77)	5.1

Table 7: Mean Numbers (and Standard Deviations) of Appropriate Object Actions  
During the Memory Trials by Age and Condition

	<u>Between-Scenario</u>	<u>Within-Scenario</u>
2.5-year-olds	7.3 (.87)	6.8 (.94)
3-year-olds	7.4 (.92)	7.7 (.48)

Table 8: Mean Numbers (and Standard Deviations) of Correct Choices of Both Identities During the Memory Trials by Age and Condition

	<u>Between-Scenario</u>	<u>Within-Scenario</u>
2.5-year-olds	2.33 (1.44)	1.50 (1.0)
3-year-olds	2.73 ( 1.1)	1.23 (1.17)

Table 9: Parental Ratings (and Standard Deviations) of Children's Home Behaviors

	2.5-year-olds	3-year-olds
A. Play participation	4.6 (.58)	4.8 (.44)
B. Television viewing	3.0 (.81)	3.2 (.42)
C. Pretend activities	3.9 (.88)	4.5 (.72)
D. Object substitution in pretense	3.8 (.96)	3.9 (.72)
E. Sibling interaction in pretense	3.7 (1.1)	3.4 (1.3)
F. Parental interaction in pretense	3.6 (.72)	3.7 (.82)

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\* The scale ranged from 1 (never) to 5 (very often)

## APPENDIX

### SURVEY QUESTIONS DISTRIBUTED TO PARENTS

1) Does your child have any siblings that live in the same household as him or her? Y / N

If so, what gender and how old? \_\_\_\_\_

2) Does your child attend daycare? Y / N

If so for how many days/hrs. a week? \_\_\_\_\_

3) Please rate the following questions between 1 and 5 according to the scale below.

1 = never    2 = almost never    3 = sometimes    4 = often    5 = very often

A. How often is your child engaged in play activities?

1            2            3            4            5

B. Does your child watch television?

1            2            3            4            5

C. Does your child engage in pretend activities at home?

1            2            3            4            5

D. How often do they use object substitution at home during pretend activities?

1            2            3            4            5

E. If siblings, how often do they interact with them in a pretend setting?

1            2            3            4            5            N/A

F. How often do you engage in pretend play with your child?

1            2            3            4            5

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