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The Relationship Between Theory of Mind, Symbolic Transformations in Pretend Play, and Children's Social Competence

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THE FLORIDA STATE UNIVERSITY

COLLEGE OF EDUCATION

THE RELATIONSHIP BETWEEN THEORY OF MIND, SYMBOLIC
TRANSFORMATIONS IN PRETEND PLAY, AND CHILDREN'S SOCIAL
COMPETENCE

By

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To my parents, İhsan and Zahide Keskin
and
to all children.

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ABSTRACT

The relationship between theory of mind, symbolic transformations in pretend play, and children's social competence was examined. In the within-subjects design, the effects of peer context on children's symbolic transformations were also explored by observing dyads with similar theory of mind ability and dyads with differing theory of mind ability. Forty-seven children (26 females and 21 males) enrolled in five private preschools participated in the study. The participants' social skills were measured using the *Social Skill Rating Scale* (Gresham & Elliott, 1990). Theory of mind was measured using four tasks and the resulting data were used to categorize the students as "high theory of mind" or "low theory of mind." Children who scored low on the theory of mind tasks were observed during pretend play in two peer contexts, first with a peer who also scored "low" on the theory of mind tasks, and then second, with a peer who scored "high" on the theory of mind tasks. Children's symbolic transformations during pretend play were measured using Matthews' (1977) symbolic transformation categories in the order specified by McLoyd (1980). The data were analyzed using repeated measures Analyses of Variance (ANOVA) and correlational analyses.

A significant correlation was found between theory of mind and children's role play. There were no significant correlations between theory of mind and children's social competence, and no relationship was found between symbolic transformations in pretend play and social competence. Children who had scored low on the theory of mind tasks were able to engage in more advanced ideational transformations (i.e., *role attribution*) when they interacted with a child who was more advanced in terms of theory of mind. Peer contexts seem to affect children's symbolic transformations in pretend play, and role play in particular. The findings suggest that along with peer context, role play, rather than pretend play in general, contributes to the development of a theory of mind. The results are discussed in terms of previous research and theory. Implications of the study for practice, and suggestions for future research were also discussed.

CHAPTER I INTRODUCTION

The nature, function, and significance of children's play has long been of interest to educators, researchers, and others who study the psychological bases of child development. As early as the eighteenth and nineteenth centuries, researchers recognized the importance of play (e.g., Froebel, 1897), and empiricists conducted naturalistic studies (e.g., biographies of children and detailed observations of children's lives). More recently, in the twentieth century European and American psychologists conducted studies designed to contribute to a growing body of knowledge on the significance of play (e.g., Piaget, 1962; Smilansky, 1968). This was followed by significant interest in the psychodevelopmental nature of play, and its role in children's learning (Ortega, 2003). Findings from these studies and others led to a general understanding and acceptance of the value and significance of children's play.

Play can be defined as an "*activity which is free, complete in itself, and artificial or unrealistic*" (Burke, 1971, p. 38, italics in original). Burke used three criteria (free, complete, artificial or unrealistic) to differentiate play from other activities such as work. The first criterion is that play is a free activity. What Burke meant by 'free' is that play is uncontrolled by internal and external compelling impulses. For instance, the song of a bird cannot be considered as play because the singing of a bird is ruled by instinct. If one is forced to play, this activity can no longer be considered as play. Inner and/or outer compulsions, such as being very hungry or being scared, prevent the occurrence of play. The second criterion, complete in itself, refers to the fact that play is practiced for its own reason rather than for anything else. In other words, play is complete and pleasing, and is beyond external rewards such as money or reputation (Weiss, 1969 as cited in Burke, 1971). The third criterion is that play is artificial, namely, less than complete or realistic. A child's play consists of elements

resulting from his or her experiences. However, these elements are manipulated in order to be more controllable, convenient, and meaningful (Burke, 1971). From this point of view, play does not reflect complete reality because in play reality is distorted.

Research on play by psychologists and educators led to the general consensus that play serves a developmental role. Moreover, play is related to children's social, cognitive, and emotional development. Play, for example, improves children's social development (e.g., Erikson, 1950; A. Freud, 1968), and their understanding about social rules and social roles (Berk, 1994; Haight & Miller, 1993 as cited in Berk, 1994; Vygotsky, 1978). Furthermore, play influences children's language/literacy development (Casby & Ruder, 1983), as well as their moral development (Walton, 1985). While many scholars have contributed to the body of knowledge on children's play, arguably, Piaget is one of the most important contributors. Piaget made a significant contribution to the knowledge base and foundation of educational psychology (Mooney, 2000). More specifically, Piaget studied children's play and noted that children's egos are satisfied through their symbolic play behaviors:

Play enables the child to re-live his past experiences and makes for the satisfaction of the ego rather than its subordination to reality (....) Symbolism provides the child with live, dynamic, individual language indispensable for the expression of his subjective feelings, for which collective language alone is inadequate. (Piaget, 1962, p. 167)

Play has also been perceived as a critical process with respect to social-emotional development (Erikson, 1950; A. Freud, 1968). During play young preschoolers perform fantasies. By doing so, they manipulate reality and hold an active role even though, in reality, their role may be passive. Therefore, play has a defensive role in that it allows the child to escape his or her fears. Throughout play, children change those parts of reality that bother them. Play serves as preparation for important life experiences. During play, children try to attain pleasure in a situation in which there is a minimum risk of unalterable outcomes. In play, children engage in repetitive activities to make negative real life experiences less, or no longer, destructive. In the case of experiencing an event that is too difficult, or too vast to absorb, the child engages in repetitive activities to seek satisfaction. These repetitive activities are endeavors to manage difficult situations that bother the individual. Play, then, serves as a gradual absorption of anxiety, as well as mitigation of anxiety and deficiencies (Peller, 1954; Wäelder, 1933). In other words, during play children confront difficult life

situations by involving themselves repetitively with the activity until they reach a point where they no longer feel insecure.

While all types of play appear to have social consequences, pretend play is considered critical for children's social development (e.g., Curran, 1999). In considering the development of social cooperative behavior, self-control, and insightful thoughts, Vygotsky believed in the importance of pretend play (Berk, 1994). Curran's (1999) study shows that children's ability in perspective taking increases, while their egocentric thinking decreases through the pretend series. According to Farver and Frosch (1996 as cited in Kim, 1999), during pretend play, symbols are employed by children to assist them in obtaining the feeling of being far away from the characters and the situations being represented. During pretend play they feel secure and restrained from disturbing occasions or situations. The idea that pretend play promotes social development is further supported by Kim (1999) who noted that pretend play promotes social-cognitive development by endorsing narrative recall.

In pretend play, children employ mental representations. This means that children make inferences about other persons' mental states when they engage in the act of pretending. The possession of mental states such as 'belief,' 'desire,' and 'pretend' are necessary in terms of acquiring a representational theory of mind (German & Leslie, 2001; Lillard, 1993, 2001a). Theory of mind is an active area of developmental research (e.g., Leslie, 1987; Perner, 1988a, 1991). Theory of mind "refers to the ability to reason and make inferences about another's mental states, and presupposes the ability to hold beliefs about another's beliefs, or to mentally represent another's mental representation" (Jarrold, Carruthers, Smith, & Boucher, 1994, p. 446). Several studies support the idea that there is a relationship between pretend play and theory of mind (e.g., Lalonde & Chandler, 1995; Lillard, 2001a, 2001b). Researchers, such as Astington, Harris, and Olson (1988), emphasize the importance of pretend play in relation to the development of a theory of mind in young children.

This study is an exploration of the relationship between theory of mind, symbolic transformations in pretend play, and children's social competence. In this study, children were assessed using four theory of mind tasks. Then, based on their theory of mind scores, they were grouped as 'low' or 'high.' The children were then assigned into dyads ("low-low," "low-high") to engage in pretend play. Then, using Matthews' (1977) categorization of

symbolic transformations in pretend play, children's symbolic transformation scores were obtained. Children's symbolic transformations in *low-low* and *low-high* dyads were compared. Finally, the relationships between children's theory of mind scores, symbolic transformation scores, and social competence scores were examined.

In this chapter the definition of the problem being examined is presented along with an overview of a theoretical rationale for the study. Then, the purpose and significance of the study is explained. Specification of the research questions and hypotheses are provided, followed by definitions of key terms employed in the study.

Statement of the Problem

The relationship between theory of mind and pretend play has been examined by many researchers (i.e., Leslie, 1987; Lillard, 2001b), as well as the relationship between pretend play and its effects on children's social competence (i.e., Connonly & Doyle, 1984). Yet, previous research fails to provide an explanation for the relationship between theory of mind, symbolic transformations in pretend play, and children's social competence. Recent research findings highlight the association between theory of mind and social behavior/understanding, including social competence (e.g., Astington & Jenkins, 1995; Capage & Watson, 2001; Charman & Campbell, 2002; Lalonde & Chandler, 1995; Taylor & Carlson, 1997; Watson, Nixon, Wilson & Capage, 1999). However, the relationship between theory of mind, symbolic transformations in pretend play, and children's social competence is unclear. Thus far, there is no uniformly recognized theory or data to describe and explain the relationship between theory of mind, symbolic transformations in pretend play, and children's social competence.

Previous research (i.e., Matthews, 1977; McLoyd, 1980) has found differences in the symbolic transformations of boys and girls in pretend play. However, these studies did not examine peer context that may have been responsible for such differences. Therefore, the present study extends previous research by comparing the symbolic transformations of boys and girls in different peer contexts (*low-low* versus *low-high* context).

Theoretical Framework / Rationale

Learning requires the integration and creation of symbols. Language, mathematics, music, art, and cultural phenomena are some of the areas that involve symbolic thinking. The utilization of symbolic thinking including reflective abstraction, is required by each area (Nowak-Fabrykowski, 1992). All theorists of early cognitive development have emphasized the expansive effects of symbolic competence on children's intellectual development, as well as on the learning process. Therefore, one of the most pivotal developmental tasks confronting children is to employ symbolization (Uttal, Schreiber & DeLoache, 1995). It is clear that pretense requires symbolic thinking. Pretense is perceived as an important factor in terms of developing a theory of mind. According to Leslie (1987) pretense is one of the key developments that takes place in the second year of life. Pretense is also a component of the child's theory of mind (German & Leslie, 2001; Leslie, 1987). Therefore, in this current study it was hypothesized that children who score *high* on theory of mind tasks would have higher scores on symbolic transformations in pretend play.

The theoretical rationale for considering theory of mind as a promoter of pretend play and social competence is based on ideas regarding the similarities between pretend play and the acquisition of a theory of mind. Pretending and understanding false beliefs involve similar skills, for instance the skill to think of another point of view that is different from reality. Think about a child watching his or her peer busy in a pretend play scenario of pretending a stick is a horse. Most children in this situation would not be confused, despite the fact that it is a seemingly conflicting behavior. With regard to this pretense, the reality (a stick) is represented by the pretender in a conflicting way (as a horse). Therefore, in order to comprehend the pretense of others, it seems that the skill to conceive of (or represent) the mental representations held by the pretender as well as having a representation of reality are necessary (Feldman, 2002). Thus, more detailed understanding of others' mental representations (acquisition of a theory of mind) would result in more complex forms of pretend play.

Recent research suggests a link between theory of mind and social skills (e.g., Astington & Jenkins, 1995; Lalonde & Chandler, 1995). Indeed, it is impossible to learn and be creative without using symbols and symbolic thinking (Deri, 1982). Social life requires

abstract thinking. It follows that, as noted by Watson et al. (1999), “a more well-developed theory of mind seems likely to promote adaptive social functioning” (p. 390). Thus, in the current study, it was hypothesized that there would be a significant correlation between children’s theory of mind ability and their social competence.

To explicate the relationship between children’s theory of mind and symbolic transformations in pretend play, a Vygotskian theoretical structure may serve as a foundation. According to Vygotsky (1978), there are two developmental levels: “actual developmental level” and “level of potential development.” Actual developmental level refers to “functions that have already matured, that is, the end products of development” (p. 86). Namely, it refers to what a child can do without help. A level of potential development can be defined as what a child can do by receiving help from more experienced others. Vygotsky calls the difference between these two levels “the zone of proximal development” (ZPD). Vygotsky (1978) defines the zone of proximal development as “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (p. 86). As previously discussed, obtaining others’ point of view is related to theory of mind. From this point of view, a reasonable assumption would be that children who engage in pretend play with a more skilled peer (i.e., one who has higher score on theory of mind tasks) would be able to represent more complex levels of symbolic transformations. Many times pretense requires knowing what other persons think or believe. That is, if you are to pretend to be someone else, then, it is necessary to have the other person’s point of view.

Vygotsky’s theory of internalization may help us to understand the relationship between pretend play, theory of mind, and social competence. According to Vygotsky, every function in the child’s cultural development appears twice: first, on the social level, and later, on the individual level; first, *between* people (*interpsychological*), and then *inside* the child (*intrapsychological*)...All the higher functions originate as actual relations between human individuals. (Vygotsky, 1978, p. 57, italics in original)

Obtaining a theory of mind ability would improve children’s ability (i.e., perspective taking ability) in pretend play. By pretending with others, children obtain knowledge about what others’ perspectives are. This learning occurs on a social level as it takes place between people. Then, children internalize this knowledge and obtain these social skills (i.e.,

perspective taking) on an individual level. In sum, developing social skills cannot take place without social interactions. It is possible to sum up the process of obtaining a theory of mind in two levels. On level one (*interpsychological*), children obtain the perspectives of others via social interactions, and on the second level (*intrapsychological*) they internalize this knowledge which, in turn, leads them to obtain well-developed social skills.

The decision to conduct the current study with four-year-old children was based on the assumption that the ability to pretend appears at about the age of two (Leslie, 1987), while the ability to understand false belief emerges at about the age of four (Jarrod, et al., 1994). Thus, it seems that four-year-olds are at the optimum age for being able to detect theory of mind. Pretending necessitates taking the other person's perspective. During pretend play, social roles are performed. In order to be socially competent, a social context is necessary. Consequently, it can be assumed that theory of mind would promote the development of pretend play. Also, a social context that would endorse children's social competence is created during pretend play.

It is generally agreed that possession of mental state concepts such as 'pretend,' 'belief,' and 'desire' are required for theory of mind ability (German & Leslie, 2001). Obtaining knowledge about the mind is a foundational area of cognitive growth (Wellman & Gelman, 1998). Namely, one of the cornerstones of cognitive development is acquaintance of the mind. Bukatko and Daehler (1998) note that almost every element of a child's growth is related to emerging cognitive skills. Changes related to thinking, such as understanding the mental state of others, have an impact on other areas of cognitive development such as language and social development (Bukatko & Daehler, 1998).

Some researchers underline the importance of having a socio-cultural perspective regarding examination of the mind and cognition. Toren (1993) states that all cognitive development processes are closely related to emplacement of the individual in the society. From this point of view, it is reasonable to assume that understanding the mental states of others, an important component of cognitive development, enables children to function in society properly. Because cognitive development and theory of mind are related, Toren (1993) suggests examining the mind from a historical and anthropological perspective, in order to improve our understanding of the mind. Historic and anthropologic perceptions of the mind propose that cognition is a biological as well as a historical process. "Human

cognition is a historical process because it constitutes – and in constituting inevitably transforms – the ideas and practices of which it appears to be product. In short, human cognition renders intentionality as inevitably historical” (p. 461-462). The child’s image of ‘other’ is based on the biological and cultural distinction. To be precise, thinking of ‘other’ reveals the reality that ‘other’ is something or someone separate from our biological existence, additionally, ‘other’ reveals the cultural separateness. Therefore, understanding of humans, and more specifically the human mind, requires historic and anthropologic perspectives. Anthropological theory of cognition, more specifically the mind, is acquainted with the notion that individuals are the results and creator of their own histories. This perspective perceives individuals as inseparable from society and culture. Individuals’ ‘perceptions’ cannot be easily separated from their ‘cognitions.’ Also their ‘emotions’ and ‘rationality’ are not easily separable from each other (Toren, 1993). That is to say, a standpoint lacking historic, societal, and cultural perspectives cannot provide adequate information to help us understand humans and the human mind.

Lillard (1998a), another researcher who approaches theory of mind from a socio-cultural perspective, emphasizes the importance of having cross-cultural perspectives in order to understand the development of a theory of mind. Perceptions of psychological or mental states can be different across the world. For instance, European Americans put great emphasis on knowing the mind, on rational thinking, and on science, while other cultures put great emphasis on concealment of the mind, on emotion, and on mysticism. Due to continual occurrences, one can reach a conclusion that people’s actions and reality do not correspond to actuality. However, it is not the same for all cultures. For instance, the Ancient Greeks believed that gods have control over some of their deeds. These kinds of differences among cultures might contribute to differentiation in folk psychology (Lillard, 1998a). That is to say, because different cultures may perceive things differently, their way of perceiving psychological, and mental states may be different. Thus, examining the development of a theory of mind requires a cross-cultural perspective.

Research suggests that during the preschool years, decisive developments in children’s theory of mind occur. In these years, abilities that are related to folk psychology, which is based on notions comprising a kind of commonsensical theory of explanation of others’ actions (Horgan & Woodward, 1985), become evident (Carlson & Moses, 2001).

Younger preschoolers often think that beliefs and appearance always correspond to actuality, and they tend to perceive things from only one perspective. By the time they reach the age of five, they have a noticeably adult-like appreciation of these issues (Carlson & Moses, 2001). By five years of age, children come to understand that people live their lives in a mental content world, by which their actions are determined by how they are supposed to perform in the real world consisting of real objects. A well-developed theory of mind permits children to understand people's actions in a mental way. This understanding takes place via recognizing that people have ideas and beliefs in an actual world, and they act according to their beliefs rather than the reality (Lundy, 2002).

Much of the research investigating the progress of a theory of mind has focused on appreciating its representational roots. While theory of mind has become the center of attention in this area, understanding the role of theory of mind in children's social development has not been of interest to researchers (Charman & Campbell, 2002). However, in recent years, the attention of researchers has shifted to focus on the role of theory of mind in children's social competence/social behavior (e.g., Astington & Jenkins, 1995; Lalonde & Chandler, 1995). Social competence refers to "the attainment of relevant social goals in specified social contexts, using appropriate means, and resulting in positive developmental outcomes" (Ford, 1982, p. 324).

Although there is less research focusing on theory of mind and social competence, there are some studies that provide evidence supporting the many connections between them (e.g., Astington & Jenkins, 1995; Capage & Watson, 2001). The role of social competence in acquiring and sustaining social and educational achievement is important. Moreover, being socially competent plays a significant role in terms of mental health, educational achievement, and personal adjustment in childhood (Boyum & Parke, 1995). According to Jenkins and Astington (2000), some recent empirical studies found that social behavior and theory of mind are directly related (e.g., Astington & Jenkins, 1995; Lalonde & Chandler, 1995). Lalonde and Chandler (1995) found that early false belief understanding and intentional social behavior are positively correlated. Dunn, Brown, Slomkowski, Tesla, and Youngblade (1991) found that children who were capable of elucidating actions based on false beliefs had more conversations with their mothers on emotion states. They also were

more cooperative with their older siblings. It seems plausible, therefore, that theory of mind is related to children's social behavior.

In summary, our understanding of the development of a theory of mind has changed. Researchers have examined its relation to pretend play and social competence. As a result, our knowledge has increased. However, there is still a gap in the research literature that results from excluding the role of theory of mind in relation to pretend play, and more specifically the development of social competence. This study is an attempt to fill this gap.

Purpose and Significance

The goal of the present study was to explore the relationship between children's theory of mind, symbolic transformations (object and ideational transformations) in pretend play, and social competence. The relationship between theory of mind and pretend play has been examined by many researchers. Children's theory of mind is mainly examined by 'false beliefs' tasks. Current research suggests that being able to pretend is related to one's theory of mind. However, researchers have not examined the relationship between theory of mind, pretend play, and the related effects on social competence.

The significance of this study is at least twofold. First, this study was an endeavor to examine theory of mind (ToM) by using multiple ToM tasks to eliminate the mistakes caused by using a single task. Many researchers failed to use four theory of mind tasks at the same time in their studies. Typically, four false belief tasks have been used to assess young children's theory of mind; change in location task, appearance-reality task, unexpected contents task, and misleading pictures task. However, previous studies have not employed all these four tasks in a single study, with the exception of a study by Lundy (2002) where she assessed the theory of mind in deaf children. Not utilizing more than one task to assess theory of mind could result in unreliable outcomes. Therefore, in this current study, four tasks were employed to assess theory of mind.

Second, the study may contribute to theory and research concerning sociology of childhood, because it may improve our understanding about the link between pretend play, theory of mind, and children's social competence. Some researches mainly focus on the relationship between object transformations and language ability. Although much has been

written about theory of mind, research on theory of mind and its implications for social competence is limited. This research examined the link between theory of mind, symbolic transformations in pretend play, and children's social competence. The educational importance of play is underlined by several researchers. This current study provides a closer look at peer context. The results of this study should improve our understanding of how playing with more skilled peers influence the symbolic and social performance of children. With this information, early childhood educators and researchers should have a better understanding of the social context of play. This understanding can assist in creating proper play contexts to improve the educational process of young children.

The ability to pretend appears at about the age of two (Leslie, 1987). A major development that emerges during the fourth year of human life is the ability to understand false belief (Jarrold et al., 1994). That is to say, four-years-olds are capable of predicting others' beliefs. False belief tasks are utilized to assess theory of mind. It is important to study theory of mind because it plays a pivotal role in our social lives. It is an influential social instrument that makes possible the actions of others to be elucidated and predicted. Furthermore, acquisition of a theory of mind plays an active role in terms of growth of 'particular forms of reasoning' and it may correspond to an important step with regard to cognitive development (Moore & Frye, 1991).

Social competency is crucial for maintaining positive relationships with others. (Rubin, Bukowski, & Parker, 1998). One of the objectives of this study was to obtain a better understanding of how theory of mind and pretend play affect children's social competence. Refining our understanding of the relationship between these three components (theory of mind, pretend play, and social competence) would provide a better understanding of the social worlds of children.

Previous researchers have investigated the association between theory of mind and social competence (e.g., Capage & Watson, 2001; Charman & Campbell, 2002), and the association between pretend play and theory of mind (e.g., Leslie, 1987; Lillard, 2001a). This is the first study to look at all three variables (theory of mind, pretend play, and social competence) in a sample consisting of children with typical development. Because research has not focused on the relationship between theory of mind, pretend play, and social competence, this study was an endeavor to fill this gap by determining the relationship

between these three components. This current research went beyond the association between theory of mind and social competence and endeavored to determine whether or not pretend play and theory of mind has an impact on children's social competence. An assumption underlying this current research was that being able to represent higher level of symbolic transformations in pretend play, and having a well-developed theory of mind, should facilitate the child's social competence.

According to Wellman (1992), understanding of the mind is imperative in order to understand the social world. This understanding of their social worlds allows children to begin to comprehend that our actions are the product of internal mental states such as beliefs and desires. Indeed, a positive relationship between perspective taking ability (which is closely related to theory of mind) and social skills has been found (Dawson & Fernald, 1987). Similarly, Astington and Jenkins (1995) found that children who demonstrated explicit make-believe role assignments to themselves as well as to other children with greater occurrence, performed better on false belief tasks. It follows that children who have a more advanced theory of mind should display greater social competence than children who have an immature theory of mind ability.

Theory of mind is also associated with pretense. Leslie (1987), for example, states that the early sign of theory of mind is pretense and notes that "Pretend play is thus one of the earliest manifestations of the ability to characterize and manipulate one's own and others' cognitive relations to information" (p. 442). Children's understanding of the mind takes place when they begin to perceive the mind as 'representational' (Lillard, 1993). Namely, children who have a well-developed theory of mind perceive the mind as representational. Therefore, it was hypothesized that children who scored higher on theory of mind tasks (that is to say, who were aware of the fact that the mind is representational) would represent higher level of symbolic transformations than those who had an immature theory of mind. It is also logical to assume that children who understand the mind as representational would represent higher symbolic transformations compared to children who do not have this understanding. It was also assumed that having the ability to take another person's perspective would contribute the ability to represent higher symbolic transformations.

In the current study, the participants engaged in pretend play with selected peers on two separate occasions. Presumably, playing with a play partner a second time would

increase the child's familiarity with his or her peer and, subsequently, increase the likelihood that the two would engage in more advanced forms of pretend play and related symbolic transformations. It was therefore predicted that there would be a difference in the means of the symbolic transformation scores obtained by children in the initial play episodes and subsequent play episodes.

Finally, it is predicted that there would be gender differences in children's symbolic transformations during pretend play. Previous studies (e.g., Matthews, 1977) have found gender differences in children's use of symbolic transformations during pretend play. Girls used object and ideational transformations equally whereas boys used object transformations more frequently than girls. Similar gender differences have also been reported by McLoyd (1980), with girls utilizing more *role attribution* than boys. Therefore, in this current study it was hypothesized that there would be a statistically significant difference in the means of the symbolic transformation scores obtained by dyads of boys and dyads of girls.

Research Questions and Hypotheses

This study is undertaken to address the following research questions:

1. What is the relationship between theory of mind and children's symbolic transformations in pretend play?
2. What is the effect of peer context on children's symbolic transformations in pretend play?
3. What is the relationship between children's symbolic transformations in pretend play and their social competence?
4. What is the relationship between theory of mind and children's social competence?
5. Are there any differences between children's initial play episodes and subsequent play episodes in terms of their symbolic transformation scores?
6. What is the effect of gender on children's symbolic transformations in pretend play?

Six hypotheses were formulated for the study, as follows:

Hypothesis 1. There will be a statistically significant difference in the means of the symbolic transformations of dyads with similar theory of mind ability and dyads with different theory of mind ability.

Hypothesis 2. There will be a statistically significant correlation between children's theory of mind scores and their symbolic transformation scores.

Hypothesis 3. There will be a statistically significant correlation between children's theory of mind scores and their social competence scores.

Hypothesis 4. There will be a statistically significant correlation between children's symbolic transformation scores and social competence scores.

Hypothesis 5. There will be a statistically significant difference in the means of the symbolic transformation scores obtained by children in the initial play episodes and subsequent play episodes.

Hypothesis 6. There will be a statistically significant difference in the means of the symbolic transformation scores obtained by dyads of boys and dyads of girls.

Definitions of Terms

Folk psychology. “Folk psychology is a network of principles which constitutes a sort of common-sense theory about how to explain human behavior” (Horgan & Woodward, 1985, p. 197).

Interpsychological level. In a child's cultural growth, this level refers to the function that takes place *between* people (Vygotsky, 1978).

Intrapsychological level. In a child's cultural growth, this level refers to the function that takes place *inside* the child (Vygotsky, 1978).

Mental states. It is also called ‘*propositional attitude states*’ by philosophers. These states refer to ‘attitudinal states’ that “include belief, desires, intentions, hopes and fears” (Lowe, 2000, p. 40).

Peer context. In this study, peer context refers to play with a peer with similar theory of mind ability versus different theory of mind ability.

Play. Play is an “*activity which is free, complete in itself, and artificial or unrealistic*” (Burke, 1971, p. 38, italics in original).

Pretend play. Pretend play refers to the “voluntary transformation of the here and now, the you and me, and the this or that, along with any potential action that these components of a situation might have” (Garvey, 1990, p. 82).

Social competence. Social competence refers to “the attainment of relevant social goals in specified social contexts, using appropriate means and resulting in positive developmental outcomes” (Ford, 1982, p. 324).

Theory of mind. Theory of mind “refers to the ability to reason and make inferences about another’s mental states, and presupposes the ability to hold beliefs about another’s beliefs, or to mentally represent another’s mental representation” (Jarrod, et al., 1994, p. 446).

Zone of proximal development. This term refers to “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978, p. 86).

CHAPTER II

REVIEW OF THE LITERATURE

In this chapter, a review of theoretical and relevant empirical research is presented. The first major section consists of a definition of theory of mind, cornerstones regarding the development of a theory of mind, an overview and discussion of theory of mind, descriptions of frequently used theory of mind tasks, and an introduction to the different theories of theory of mind. This is followed by a discussion of theory of mind and autism. Even though this study examines theory of mind in children with typical development, autism is examined in order to point out the serious consequences of a failure to develop a theory of mind. Then, socio-cultural factors that affect the development of a theory of mind are discussed. The second major section of this chapter provides a review of theoretical and empirical studies about pretend play. Theoretical explanations regarding the link between pretend play and the development of a theory of mind are also presented. This is followed by the third major section that includes a review of research concerning social competence. Explanations of components of social competence are provided as an introduction to the topic. Then, the relationship between pretend play and social competence is addressed. Studies exploring the effect of theory of mind on the social competence of young children are examined. Finally, a summary is presented in the last section of the chapter.

Theory of Mind

An increasing body of research focuses on children's theory of mind (e.g., Astington & Jenkins, 1995; Lillard, 1993; Schwebel, Rosen & Singer, 1999). Theory of mind was first introduced by Premack and Woodruff (1978), who in their seminal study, defined theory of mind as:

An individual has a theory of mind if he imputes mental states to himself and others. A system of inferences of this kind is properly viewed as a theory because such states are not directly observable, and the system can be used to make predictions about the behavior of others. (p. 515)

In order to understand the social world, understanding of the mind is critical and is a significant attainment for children. Children begin to understand that inner mental states such as beliefs and desires produce the explicit actions of self and others. Therefore, they gain consciousness about making a distinction between deliberate and unintentional actions, between desires and actuality, between plan and results, between fact and deceit (Wellman, 1992). Some examples of the commonsense theories of mind agreed upon by most adults are listed by Wellman (1992):

1. Ideas and things are different: An idea of a horse and a horse in reality are different things because the former is mental and immaterial and the latter is physical and material.
2. Reality and beliefs are different: Beliefs and reality may not be the same. For example, while the world is sphere-shaped in reality, one can hold a false belief such as believing that the world is flat.
3. Desires and results are different: Planning and performing are two different things. One can wish to go abroad, but it is completely different than actually going abroad. It is possible that one may never visit abroad due to financial problems or any other reasons. In other words, mental activities and deeds correspond to two different things.
4. Reality does not restrain fantasy: It is possible for a person to imagine unreal, impracticable, or imaginary things, such as immortal life.
5. Mind is personal and individual: Because everyone has his or her unique personal mind, mental states or attitudes can differ across individuals. It is possible for me to perceive myself as a handsome person while someone else can hold a different opinion.
6. Mind and body are not the same. The event of being locked up in a place does not restrict my thoughts. My thoughts can be free regardless of the physical situation I am in. My mind can be exhausted even though my body is relaxed.

7. The way of thinking/reasoning about realities or physical states differs from the way of thinking/reasoning about mind: If a president's previous job was an actor and he became president, one can say that the president is a retired actor. However, thinking about the president does not necessarily represent the fact that the president is a retired actor.

In light of these examples, it can be suggested that adults are aware of the fact that the mental world consisting of thoughts, beliefs, desires, fantasies, mental entities, and private selves is relatively dissimilar compared to the material world that includes the physical, public, and factual world (Wellman, 1992).

It is commonly agreed that possession of mental state concepts such as 'belief,' 'desire,' and 'pretend' are required for theory of mind ability (German & Leslie, 2001). Leslie (1987) initiated the idea that pretense, one of the key developments that takes place in the second year of life, is a component of the child's theory of mind (German & Leslie, 2001; Leslie, 1987).

Theory of mind is an extensive concept (Astington, 1998) that involves the understanding that internal mental states, such as beliefs, intentions, plans, hopes, and desires rule people's behavior (Wimmer & Perner, 1983). Having theory of mind provides awareness that human actions are consequences of mental concepts such as thoughts, beliefs, desires, and intentions. It also provides the ability to elucidate and forecast behaviors of others (Moore & Frye, 1991; Premack & Woodruff, 1978). Beliefs and desires are considered as essential in the process of acquiring a theory of mind. In other words, in order for children to obtain an understanding of their own and others' mental states, and to explain and predict human actions, beliefs and desires play a crucial role (Moses & Flavell, 1990; Wellman, 1991). It is clear that beliefs regarding the world do not always represent reality. One of the cornerstones of the development of a theory of mind is the ability to distinguish what is false and what is not. Researchers usually scrutinize whether or not children understand beliefs as mental states by examining the child's understanding of false beliefs (Bloom & German, 2000). Wimmer and Perner (1983) developed an experimental test of children's understanding of a false belief. This test is also known as the "unexpected transfer" task. In this test, the subject sees that an object is placed into a cupboard in the presence of another person. When the other person is absent, the subject observes an unexpected location change

of the item that was previously placed in a cupboard. The subject now knows that the location of the object has been changed, and also knows that the other person who is absent at that moment is still unaware of this recent change. As a result, the subject holds a different belief about the true location of the object in comparison to the other person. Then, the subject is asked to indicate the place in which the other person would look for the item when he or she returns. In this procedure, whether or not the subject has an overt and definite demonstration of the other's false belief is tested.

Other experimental tests of children's understanding of false belief are change-of-content (Perner, Leekam, & Wimmer, 1987), representational change (Gopnik & Astington, 1988), and unexpected identity tasks (Wellman, Cross, & Watson, 2001). In change-of-content task, children are presented with specific containers (such as a crayon box) that normally hold familiar contents and are asked to guess what are inside of the containers. The child is shown the unexpected contents within the container. Then, the child is asked to remember his or her previous belief. Later, the child is asked what a naïve participator would guess about the content of the box. Children with no well-developed theory of mind do not recall what their previous beliefs were after having a different belief. Taking the perspective of naïve participator is not possible for children with no well-developed theory of mind by the time they are aware of the actual content of the container.

In the representational change task, a small sponge that has a deceiving look (painted to look like a rock) is shown to the child from the other side of the table. Then, the child is given an opportunity to understand that the object is a sponge instead of a rock (Astington & Jenkins, 1995; Astington & Jenkins, 1999; Wellman et al., 2001). The unexpected identity task, which basically resembles unexpected contents tasks, is rarely utilized (Wellman et al., 2001).

In the misleading pictures task (Astington & Jenkins, 1995; Gopnik & Astington, 1988; Jenkins & Astington, 1996), a book with several pictures (partial, not full) is shown to the child. The first page shows only the ears of a dog, and then the second page shows the whole picture of the dog. The child is shown a limited picture that seems to be the ears of a cat and is asked to guess what is on the next page. The next page reveals that what seems to be the ears of a cat is in fact part of a flower. A child with a mature theory of mind would

predict (due to his or her own experience) that an inexperienced participator would think of petals of a flower as the ears of a cat (Lundy, 2002).

Utilizing false-belief tasks to assess theory of mind has been criticized by some researchers (e.g., Bloom & German, 2000; Zaitchik, 1990). Many authors claim that one of the reasons young children fail the false belief tasks is because of their difficulty with regard to verbal conversations. Children become more competent on false belief tasks when their spoken conversation skills improve (Wellman et al., 2001). Bloom and German (2000) claim that one reason for young children's failure on false belief tasks is that the tasks are too intricate for 1- and 2-year-olds. This is because young children are deficient in attention and linguistic competence.

While 3-year-olds typically do not perform well on false belief tasks (Wimmer & Perner, 1983; Perner et al., 1987) and many researchers suggest that acquisition of false belief understanding takes place at around the age of four (e.g., Moses & Flavell, 1990; Perner et al., 1987). Remarkable false-belief performance changes have been observed in children aged three to five (Wellman et al., 2001). Young children tend to believe that beliefs and appearances always correspond to reality. They also have a tendency to believe that there is only one perspective that represents the reality. By the time they are five years of age, children have reached a critical milestone because they have developed an adult-like theory of mind (Carlson & Moses, 2001).

One of the least examined aspects of theory of mind is gender differences. Researchers who have examined the development of a theory of mind either failed to report sex differences on theory of mind tasks, or failed to provide an explanation for these differences. Even studies that focused on individual differences regarding theory of mind failed to report if there were any gender differences (i.e., Capage & Watson, 2001; Pears & Moses, 2003). For example, a study by Pears and Moses (2003) examined individual differences, parenting, and theory of mind in preschool children. The authors, however, failed to provide any information on whether or not there were sex differences on theory of mind scores.

In order to improve our understanding about the development of a theory of mind, it is necessary to consider different theories regarding theory of mind. The following section, therefore, discusses the three major explanations of theory of mind.

Theories of mind

Theory-theory. According to the theory-theorists (Gopnik & Meltzoff, 1997; Gopnik & Wellman, 1992, 1994) our knowledge concerning the mental world is a theory. The mental world includes the realm of beliefs, wishes, objectives, thoughts, etc. The theory-theory is sometimes called commonsense psychology (Forguson & Gopnik, 1988; Wellman, 1988). In relation to theory-theory, “our everyday conception of the mind is an implicit naive theory; children’s early conceptions of the mind are also implicit theories, and changes in those conceptions are theory changes” (Gopnik & Wellman, 1994, p. 257).

Theory-theorists claim that information we have in relation to the mind contains an everyday “framework” theory, rather than a real scientific theory. To them, three properties are required for a body of knowledge. First, the body of knowledge must include an ontology that lies in its domain, as opposed to other domains. Second, causal regulations, similarly distinctive to the theory’s domain, must be employed by the body of knowledge. Third, instead of a system with unconnected contents, the body of knowledge is required to consist of a system with interconnected concepts and beliefs. These three requirements are met by our informal theory of mind. First, our beliefs, wishes, and thoughts are mental entities, for this reason, the requirement of fulfilling ontological criteria is carried out. Second, “psychological causality (she tried to get it because she wanted it and thought she could get it, etc) is also found only in the domain of the psychological; physical objects are not caused to move by such mental states” (Flavell, 1999, p. 24). Third, our knowledge about the mind is interrelated with diverse mental states that are connected to one another. For example, our perception about things may affect what we believe, in turn, our beliefs about things may influence our perception (Flavell, 1999).

Theory-theorists maintain that experience has a formative role in children’s theory of mind. They assume that the experience provides information that cannot be obtained by their present theory of mind. Consequently, the experience enables children to modify and ameliorate this ‘theory.’ For instance, after recognizing that people’s beliefs and desires are related to each other, a psychologist whose specialty is ‘desire’ will eventually change his or her specialty to ‘belief-desire.’ Piaget’s theory of equilibration can be applied in order to understand this process. The experience originates in disequilibrium and gradually a novel, higher state of equilibrium (Piaget, 1985 as cited in Flavell, 1999) takes place (Flavell, 1999).

According to theory-theory, if one has an incorrect conception regarding mental states such as belief, attributing mental states to others will not be correct. As a result, attributions made to oneself will not be correct either (Gopnik & Wellman, 1992). In other words, attributing mental states to another in a correct way requires obtaining a non-faulty conception of mental states.

Simulation. In accordance with simulation theorists (e.g., Harris, 1992), children know their own mental states ‘introspectively.’ Because of this consciousness, they are able to assume others’ mental states via role taking, namely simulation. For instance, when children are asked to guess what another child would assume about the content of the candy box during the false belief task, they think what they would say if they were in the position of the naïve child who knows only the appearance of the box (Flavell, 1999). Children’s engagement in consideration of others during pretend play may maintain the simulation theory of why theory of mind and pretense are linked (Lillard, 2001a).

According to Harris (1992), precision of any simulation rely (1) on feeding in the relevant pretend inputs, and (2) on the target behavior being guided by the decision-making system. If these twin assumptions are not met, inaccurate predictions are likely. In the course of development, children become increasingly proficient at feeding in the appropriate pretend inputs. Much of that advance is constrained by increments in imaginative power. (p. 141)

Modularity. Modularity theorists such as Leslie (1994b; Leslie & Roth, 1993 as cited in Flavell, 1999) suppose that young children do not necessarily attain a theory in relation to mental representations. Leslie assumes that the acquisition of a theory occurs in the course of neurological maturation of a sequence of three domain-specific and modular mechanisms. The first mechanism is called Theory of Body mechanism (ToBY). Children have ToBY by six months of age. ToBY permits the child to realize mechanical features of objects. In other words, the domain of ToBY includes mechanical features of objects and events. The second and third mechanism is called Theory of Mind mechanism (ToMM1 and ToMM2). Children’s theory of mind is probably the product of ToMM. The existence of a particular ‘neurocognitive’ mechanism is proposed by the ToMM model. Children are able to utilize mental states due to being equipped with ToMM. Instead of agents’ mechanical properties, ToMM manages the intent or ‘aboutness’ of agents. ToMM1 develops around nine months of

age. It permits the child to interpret during the process of observing the environment and pursuing objectives. Development of ToMM2 occurs around 18 months of age.

Representation of agents and inferring particular attitudes to information (such as make-believing and belief) are performed by ToMM2. Children with ToMM2 are capable of comprehending that John *thinks* that inside of the candy box is candy and Mary is *acting as if* an empty mug is full of tea. In sum, modularity theorists believe that children have an innate or early maturing modular mechanism. Modularity theorists concentrate on decoupling. A decoupled world plays a pivotal role in pretend play. It is the focal point of pretend play and is essential for explaining the relationship between pretend play and theory of mind (Flavell, 1999; German & Leslie, 2001; Leslie 1994a, 1994b; Leslie & Thaiss, 1992; Lillard, 2001a).

It is evident from the above discussion that there is no single answer to the question of how one develops theory of mind. While some researchers approach theory of mind as an implicit naïve theory (e.g., Gopnik & Wellman, 1994), others perceive it as an assumption obtained via simulation (e.g., Harris, 1992) or as a matter of neurological maturation (e.g., Leslie, 1994b). No matter how we obtain theory of mind, research suggests that failure to develop an adult-like theory of mind can have some serious consequences, such as autism (e.g., Baron-Cohen, 1988; Wellman, 1992). In the following section, therefore, autism is examined in terms of the development of a theory of mind.

Theory of Mind and Autism

Several studies (i.e., Baron-Cohen, 1987; Baron-Cohen, Leslie, & Frith, 1986) have indicated that autism may be related to an immature theory of mind. Baron-Cohen et al. stated that autism maybe associated with a particular dysfunction regarding conceiving of mental circumstances. Children with autism display social deficiencies and difficulties engaging in pretend play. According to some researchers it is because these children have an underdeveloped theory of mind (Baron-Cohen, 1988; Leslie, 1987; Wellman, 1992). Indeed, in accordance with Baron-Cohen (1988), it is not possible to participate in a conversation if one does not have a theory of mind.

The language used by children with autism usually consists of a restricted range of communicative purposes. Obtaining a desired object or action can be given as an example. It is not common for children with autism to utilize language in order to perform social functions, such as obtaining attention, giving comment, inquiring, or informing others. Their

communicative capabilities are weakened due to difficulties with taking turns and with the elucidation and demonstration of elusive social indications (Chin & Bernard-Opitz, 2000).

Baron-Cohen et al. (1986) compared high-ability children with autism, low-ability children with Down's syndrome and children with typical development on a picture-sequencing-task. The children's ability to organize pictures according to a prearranged sequence was assessed to observe the children's understanding of the story in the sequence. Their results verified the results of the study conducted by Baron-Cohen, Leslie and Frith (1985) that children with autism are less likely to use a theory of mind. Considering the picture sequencing, children with autism performed worse than children with severe Down's syndrome. Children with autism demonstrated very insufficient mental state language compared to the children with Down's syndrome. In contrast, it was found that children with autism develop normally in their understanding of causality. The process of narration revealed that children with autism represented the smallest amount of mental state explanations, compared to children with typical development and children with Down's syndrome. At a minimum, two of the high-ability children with autism were able to utilize a theory of mind. The overall results showed that children with autism lacked mental state expressions. They were also deficient in the ability that promotes the development of a theory of mind.

Perner, Frith, Leslie, and Leekam (1989) tested 26 children with autism with mental ages 3 to 13 for their capacity to assume information about the content of a container, with or without looking inside. For the first testing session, they tested children with autism on the "boxes" communication task, the false-belief task, and then on the "bee" communication task. In the second test session, *The British Picture Vocabulary test* was utilized to evaluate children with autism's understanding of visual access in knowledge formation. During the first task, a typical box of sweets, that contained something else rather than sweet stuff, was shown to the children. Only 4 out of 26 children with autism predicted that another child would make the mistake of guessing that inside of the box is the sweet stuff that appeared on the box. In contrast, only 1 out of 12 children who had specific language impairment correctly guessed that another person would make the same mistake. The ability of children with autism to infer knowledge about the content of a container from having or not having looked inside was tested. The result showed that most of the children with autism failed this

task except for eight children (four of them had passed the false belief task). The third task that evaluated children's pragmatic ability to make correct adjustment resulted in failure for most of the children with autism. They failed to give novel information instead of replicating the old information. The results confirmed the hypothesis that children with autism are deficient in terms of taking mental states into account. Another researcher also examined theory of mind in children with autism. Happé (1994) compared children with autism, with mental disabilities, and with typical development in respect to context-appropriate mental state explanations. The results showed that children with autism failed to give context-appropriate mental state explanations compared to children with typical development, and those with mental disabilities who served as comparison groups.

In the previous sections consideration was given to theory of mind as a theory, obtained via neurological maturation or simulation. However, examining the development of a theory of mind only from these perspectives fails to provide satisfactory explanations. Because socio-cultural factors play an important role in theory of mind (Gauvain, 1998), theory of mind is examined in the following section by taking socio-cultural factors into consideration.

Theory of Mind and Social/Cultural Factors

Until recently, socio-cultural factors were excluded from the studies on theory of mind. However, the question of how socio-cultural factors affect the development of a theory of mind has recently started to attract researchers (e.g., Gauvain, 1998; Jenkins & Astington, 1996; Lillard, 1998a). Lillard (1998a) examined the cultural variations in theory of mind. She criticizes the assumption that human psychology basically has similar characteristics universally and how one develops a theory of mind is similar across different cultures. Lillard provides examples of different perceptions of mind across cultures. Referring to the study by Rosaldo (1980), she underlines some dissimilarities about the mind between European Americans and the Illongot, a Philippine tribe. The Illongot concept of mind includes the following concepts and functions: thinking, feeling, inner life, social context, violent anger, fertility, and anger. However, the European American concept of mind does not perceive inner life, social context, fertility, and health as essential functions of the mind. In addition, the European American view may perceive violent anger, one of the central functions of mind according to the Illongots, as 'mindless.' Another example is that in

European American culture, body and mind refer to two different entities. However, in Japanese culture there is no clear distinction between mind and body. The Japanese term ‘*mi*’ refers to the combination of “spirit and body, mentation and sensation, the conscious and unconscious...not a fixed entity but a ‘relational unity’ which emerges out of involvement with other (persons or things)” (Lebra, 1993, p. 65 as cited in Lillard, 1998a).

Dunn and her colleagues (1991) state that interaction styles within the family are important in respect to children’s understanding of false belief appreciation (Dunn et al., 1991). In Jenkins and Astington’s (1996) study, children’s general language ability explained 41% of the variance in the false belief understanding. The results of this study corroborate the assumption that there is a positive relationship between children’s false belief understanding and family structure (such as number of siblings). Additionally, a study by Perner, Ruffman, and Leekam (1994) shows that the number of siblings children have is positively related to their false belief task performance.

Gauvain (1998) states that “culture mediates understanding of the world and helps ensure that meaning and mental understanding are shaped by people who have regular contact. This facilitates coordinated social action that is instrumental to individual and social survival” (p. 39). Therefore, examining theory of mind by excluding other processes in human life would fail to perceive human beings as a whole (Donald, 1991 as cited in Gauvain, 1998).

One of the most famous sociologists, George Herbert Mead (1934), approached theory of mind from a social and functional perspective. Mead stated that it is impossible to develop the mind without a social context. According to Mead:

The individual members of even the most advanced invertebrate societies do not possess sufficient physiological capacities for developing minds or selves, consciousness or intelligence, out of their social relations and interactions with one another; and hence these societies cannot attain either the degree of complexity which would be presupposed by the emergence of minds and selves within them, or the further degree of complexity which would be possible only if minds and selves had emerged or arisen within them. Only the individual members of human societies possess the required physiological capacities for such social development of minds and selves, and hence only human societies are able to reach the level of complexity, in their structure and organization,

which becomes possible as the result of the emergence of minds and selves in their individual members. (p. 236)

Pears and Moses (2003) examined the relationship among demographic variables (such as maternal education, income, mother's use of instruction in reaction to child's misdeeds etc.), parenting strategies, and theory of mind in preschool children. In their study, demographic characteristics were found to be related to theory of mind. For instance, the strongest predictor of theory of mind (associating with perception, desire, and understanding of feeling) seemed to be the mothers' education level. The explanation for the findings given by authors was that maternal education could be related to theory of mind directly and/or indirectly. Maternal education could affect children's cognitive ability indirectly because it is possible for mothers with less education to spend less time with their children to explain the rationale behind social phenomena as compared to mothers with higher education. The number of siblings has been found to be positively associated with comprehension of desire. However, after controlling for age and other factors, this effect vanished. Additionally, income was found to be positively correlated to perception and understanding emotions. This effect also vanished after controlling for education and other factors. A negative correlation was found between children's cognitive skills and assertive parenting practices. Thus, children's theory of mind is negatively affected by power assertion. The authors suggested a possible explanation for this negative correlation. To them, parents may use power assertion with children who lack theory of mind skills because other strategies may not be effective with these children.

In summary, many researchers have approached theory of mind from different perspectives. Theory of mind is perceived by some researchers as a matter of developing a naïve theory (Gopnik & Wellman, 1994), neurological maturation (Leslie, 1994b), simulation (Harris, 1992), and philosophical or social-cultural phenomena (Gauvain, 1998). Like simulation theorists (e.g., Harris, 1992) many researchers who focused on theory of mind believe that examining children's play more specifically will help us to identify the root of theory of mind (e.g., Harris, 2000; Lillard, 1993, 1998b). Therefore, the following section examines the development of a theory of mind in terms of pretend play.

Pretend Play

Pretend play is a lively topic for researchers who examine the development of human thinking. During pretend play, children engage in the construction of stories and in activities. Activities that take place in pretend play include intricate planning, sequencing, orderliness, and utilization of well improved language abilities (Rutherford & Rogers, 2003). Because make-believe engages mental representations (Lillard, 1993), it is important to define ‘mental representation.’ This term refers to a mental model that corresponds to some unit or idea. In other words, it is ‘re-presentation’ of an entity or an idea within the mind. It is important to state that the mental model does not necessarily have to stand for an actual world situation or item, because it may correspond to misrepresentations or unreal objects as well. Mental representations differ from one person to another. Subjectivity plays a significant role in interactions among people. This subjectivity (rather than what we know about actuality) has a significant role in people’s actions. Representational variety takes place not only among people, but also in a person over time. This representational variety is important for individuals to realize that everybody has different, unique ideas, and realities (Lillard, 1998b). The establishment of society requires individuals to be aware of the fact that there is not only one reality that is perceived as the same by everybody, but also that members of the society may have different opinions and realities that they believe in.

Mental representations are utilized during pretend play. For example, if a child pretends a piece of block is a horse, it means that a mental representation of a horse is utilized by the child to relate that representation to the piece of block. In this process, the child reflects on the horse as represented by the block. Without mental representations, pretense cannot take place. The role of mental representations in pretense has two inferences. First, in order to pretend something, understanding of what it is or what it does is essential. For example, in order to pretend a horse, one must be familiar with what a horse is. Namely, having some kind of mental representation of a horse is required to reflect this representation on reality. Second, during the process of pretending, the child thinks about being the thing that is pretended. For example, if a child pretends to be a horse, he or she thinks about how to be a horse or what a horse does. Overall, pretense is dependent on mental representations (Lillard, 1993).

It is commonly agreed that possession of mental states such as ‘belief,’ ‘desire,’ and ‘pretend’ are necessary for theory of mind ability (German & Leslie, 2001). During pretend play, children may take others’ mind into consideration (Lillard, 2001a). Lillard (2001a) examines the relationship between pretend play and theory of mind by explaining “the Twin Earth model.” *Twin Earth* is usually used during philosophical discussions to brainstorm issues in a make-believe situation and apply them to real life situations. *Real Earth* and *Twin Earth* are very much alike. *Twin Earth* refers to an unreal world that precisely looks like *Real Earth*, but with some differences. In pretend play, participators mutually create an imaginary world. This world is an alternative to reality, but it has strong similarities with reality. During discussion, philosophers are obliged to inform each other that they are talking about *Twin Earth* instead of a real life situation. It is also the same in pretend play. By giving verbal and/or nonverbal signals during pretend play, children inform each other that the thing being pretended is not real. There are two key similarities between *Twin Earth* and pretend play. The first one is that they both are duplicated from reality and they resemble reality. The second one is that under some conditions, they both improve reasoning. The imaginative capacity that is required for both pretend play and *Twin Earth* performs a key role for systematic reasoning (Bateson, 1955/1972; Bretherton, 1984; Dias & Harris, 1990; Lillard, 2001a; Pessin & Goldberg, 1996).

The ability to pretend appears during the second year of life. In pretense, the child intentionally deforms and manipulates the situation of a reality. Pretense is a prelude for the development of a theory of mind. Namely, it is an early appearance of theory of mind. The utilization of a theory of mind is connected to the ability to pretend and comprehension of pretense in others (Leslie, 1987). Children who frequently engage in pretend play may become attentive to the importance of representation in our mental lives. More specifically, they will come to understand that actions are not only directed by actuality but also by a representation of the actuality that can be incorrect such as false beliefs (Harris, 2000). According to Leslie (1987), make-believe and understanding false beliefs are conceptually comparable to each other. During pretense, one misrepresents the reality in an intentional way. Lillard (1998b) explains how pretending and theory of mind might be related. In pretend play, social metarepresentations are employed. When a child pretends to be someone else, he or she may display the views, wishes, and opinions of the person being pretended.

Imagine a child who pretends to be a firefighter. By pretending, the child puts himself or herself into the firefighter's situation and perceives the world accordingly. Thanks to practices like taking others' perspectives through pretending, the child's theory of mind can be improved. Another explanation is that during joint pretense, pretenders must find a way to discuss the topic. By doing so, they confront the fact that other people have their own perspectives. Then, they 'synchronize' these different perspectives. During pretend, strong disagreements and other emotional circumstances are performed by children. This may also promote the development of a theory of mind (Lillard, 1998b).

Harris (2000) stresses the importance of role-play in respect to mental states of others. According to his simulation view, during role-play children act out about what people's possible behaviors would be in a particular situation. This acting out takes place through a process of simulation: they simply imagine themselves in the other person's situation and act according to that unreal situation. For instance, when a child pretends to be a mother, he or she pretends to face a situation in which a baby cries and then, acts according to this unreal situation. Pretending to be a pirate and acting as if finding a treasure, then acting according to this unreal situation and trying to hide it can be another example. It is probable that engaging in role-play may advance children's prediction skills. For that reason, it can be expected that demonstrating more understanding of mental states, including false beliefs can be accomplished by children who frequently engage in role play (Harris, 2000).

Another possible explanation of how pretend play promotes the development of a theory of mind is given by Brown, Donelan-McCall, and Dunn (1996). According to them, during play, children may motivate themselves to produce resolution in relation to contradictory points of view:

The process of joint collaboration may be a particularly salient context for developing an understanding of 'other minds.' The ability to take into account a playmate's thoughts should facilitate this play and, vice versa, efforts to collaborate should provide opportunities to compare one's ideas and desires with those of the play partner. (p. 837)

Another view on the relationship between pretend play and understanding minds is called Metarepresentational Model. Consistent with this model, during pretend play children intentionally take mental representations into account and 'manipulate' them. After obtaining the understanding of mental states, children apply their comprehension of mental states to a

situation, which takes place outside of the pretense content (Lillard, 2001a). This Metarepresentational Model perceives pretend play as an early demonstration of the aptitude of mental states conceptualization. Leslie (1987) explains how properties of mental state expressions correspond to basic forms of pretense. Three basic types of pretending are (a) item substitutions, (b) attributions of properties, and (c) make-believe objects. Three semantic properties of mental state expressions are (a) referential opacity, (b) nonentailment of truth, and (c) nonentailment of existence.

According to Leslie (1987), *item substitution* in pretend play corresponds to ‘referential opacity.’ This term is described by Apperly and Robinson (2003) as follows: imagine that we are told that inside of a box there is a ball which is a present. Namely, inside of the box, there is a present. On the contrary, if we are told that a person is thinking that inside of the box there is a ball, it does not necessary mean that the person is thinking that the ball is a present and it is inside of the box. *Referential opacity* refers to this logical property of belief statements (see, Quine, 1953). According to Leslie (1987), another correspondence is between *attributions of properties* in pretend and *nonentailment of truth* in semantic properties of mental state expressions. The truth or falsehood of propositions is not implied by propositions related to mental state terms. For instance, imagine that someone says, “John believes that the color of a cat is white.” This statement does not provide us with information on whether the cat is white or not. This *nonentailment of truth (or falsehood)* takes place in pretend as well. The last correspondence is between *make-believe objects* and *nonentailment of existence*. The existence or nonexistence of the things that are revealed in the entrenched propositions is not entailed by claims related to mental state terms. For example, if someone says, “the person who is the king of France is bald,” it is difficult to falsify this statement because it would still claim the existence of a French king (existence of the French king is entailed). However, there would be no problem if someone says, “John believes that the person who is the king of France is bald” because this statement does not entail the existence of a French king. In light of this information, “mental state expressions can provide a model with which to characterize the representations underlying pretend play” (Leslie, 1987, p. 416).

Youngblade and Dunn (1995) examined the relationship between pretend play, false belief, and affective understanding. They observed 50 children in the home setting on two

occasions. First, the participants were observed when they were 33 months old. Then, they were observed a second time when they were 40 months old (i.e., seven months later). Each child was evaluated by using false belief and affective perspective taking tasks. The results revealed that children who had more engagement in pretend play when they were 33 months old did better on false belief tasks when they were 40 months old. They also found a significant relationship between the children's understanding of other people's beliefs/feelings and early social pretense.

Astington and Jenkins (1995) examined the link between the development of a theory of mind and social interaction in 30 children of 3 to 5 years of age, controlling for age and language skills. They found that making a joint proposal in pretend play and demonstrating higher levels of false belief understanding were significantly associated. However, false belief understanding and the amount of pretend play were not found to be associated. In another study by Schwebel et al. (1999), children's demonstration of mutually constructed pretense and their ability to distinguish apparent and true identities of visually deceiving items were examined. The results provided partial confirmation for the view that children who have more involvement in make-believe play are inclined to show more sophisticated capability to integrate contradictory representations. On the other hand, this study failed to find an association between theory of mind ability and solitary make-believe play.

In summary, mental representations/states utilized in pretend play such as 'belief,' 'desire,' and 'pretend' are closely linked to theory of mind. During pretend play, children learn about false belief which is closely tied to theory of mind. They misrepresent reality and put themselves into someone else's situation. They synchronize different opinions held by others. These practices provide suitable conditions for developing a theory of mind and social competence (German & Leslie, 2001; Harris, 2000; Leslie, 1987; Lillard, 1998b). In the following section, therefore, the social competence of young children is examined.

Social Competence

Social life requires individuals to have an understanding of others' thoughts, feelings, intents as well as to have constructive and unselfish behaviors (Rubin et al., 1998). To function properly in social life, social competency plays a vital role. Even though there is a

continuing debate on definitions of social competency, it can be defined as follows: Social competence refers to having both proper social skills and the ability to employ these skills for managing different life situations, and for effective involvement in activities in society (Sarason, 1981; Sundberg, Snowden, & Reynolds, 1978; Wrubel, Benner, & Lazarus, 1981). Being socially competent requires ‘maturity’ (on an individual level and social level) regarding manifold areas (Zigler & Phillips, 1961). Involvement in social interactions and interpersonal relationships is essential for individuals to acquire social competence (Ford, 1982). A child’s social life consists of several components such as the family, the peers, and the school. Because young children’s early experiences take place in a family context, family plays an essential role in socialization process (Hartup, 1979).

Socrates described competent individuals as: “those who manage well the circumstances which they encounter daily, and who possess judgement which is accurate in meeting occasions as they arise and rarely miss the expedient course of action” (Waters & Sroufe, 1983, p. 81). Some of the components of social competency are listed by Anderson and Messick (1974). One should perceive himself or herself as an initiating and controlling agent to be socially competent. Another requirement is personal care. A competent child pays attention to cleanliness, eating, and protection practices, and feels himself or herself worthy. Freud (1961/1997) also emphasized cleanliness by stating that it is a condition for civilization. According to Anderson and Messick (1974), sensitivity and understanding with regard to social relationships are needed in order to be socially competent. Appreciation of differences (between himself/herself and others) including viewpoints of others is a sign of accepting social values. The competent child demonstrates affection towards others, shuns antisocial behaviors, and has an apposite level of concentration for an apposite length of time. Having sufficient amount of general knowledge is necessary for functioning properly in a society and for creating a foundation for interpersonal communication (Anderson & Messick, 1974).

According to Gresham and Elliott (1987), social abilities and adaptive behaviors are components of social competency. Social ability includes interpersonal behaviors, self-related behaviors, academic-related abilities, assertion, peer acceptance, and communication ability. Socially skilled children are those who are either accepted by their peers or who are well-liked. Adaptive behaviors denote “the effectiveness and degree to which an individual

meets social/cultural standards of personal independence and social responsibility” (p. 167). In accordance with Gresham and Elliott (1987), there are four types of social competence deficits: (1) skill deficits, (2) performance deficits, (3) self-control skill deficits, and (4) self-control performance deficits. “Children with *skill deficits* do not have the necessary social competencies to behave in either an adaptive or socially skilled manner or they may not know a critical step in the performance of a behavioral sequence” (p. 171, italics in original). Although a person with a performance deficit is able to carry out a certain behavior, he or she is not acquainted with accomplishing the behavior within acceptable limits. Self-control skill deficiency may result from the absence of a specific skill that is not learned due to some kind of ‘emotional arousal response’ such as anxiety. It has been shown that anxiety may cause deficiencies in acquiring proper coping behaviors (Bandura, 1977 as cited in Gresham & Elliott, 1987). Children who have a self-control performance deficit are capable of performing a particular skill but they employ the skill rarely due to an emotional problem such as impulsivity. Impulsive children may be able to represent proper interactions with others but usually perform improper behaviors (Gresham & Elliott, 1987).

Because appreciation of others’ viewpoints is considered important for social competency, it is a basis for many social cognitive aptitudes including “person perception (the characterization of what an individual is like), empathy (the ability to perceive and feel another’s affective state), and referential communication (the ability to effectively communicate with another person)” (Meichenbaum, Butler, & Gruson, 1981, p. 46). Role taking is closely related to pretend play. According to Selman (1971), role taking ability is a ‘social-interpersonal’ ability because it requires perception of the world by inferring another person’s perspective. Role taking is considered as a ‘prototypical’ social and cognitive ability. Waterman, Sobesky, Silvern, Aoki, and McClauley (1981) found a negative association between perspective taking and social withdrawal. The explanation given by the authors is that children who have deficiencies in understanding social interactions may feel disheartened to be involved in social interactions.

In a civilized world, individuals are required to put some limit on their pleasure and suppress their instinctive inclinations. These self-limitations are necessary for the development of civilization and culture (Freud, 1961/1997). Social life requires individuals to control their instantaneous impulses. Society cannot exist if its members act according to

their immediate impulses. From this point of view, Vygotsky (1978) emphasized the importance of play in terms of social development of the child. To him, play produces situations for the child to act in opposition to his or her immediate impulse and during play a child's utmost self-control is accomplished (Vygotsky, 1978). When children engage in fantasy play, they may create a framework for expansion of social skills (Connolly & Doyle, 1984) that promote the understanding of conventionalities. Ortega y Gasset (1943) emphasized the importance of conventionalities with respect to society. He accentuated the crucial necessity of conventionalities for the existence of society. To him, failure with regard to self-control undermines conventionality. When the conventionality declines, the 'gorilla' in us will rise. In light of the information provided above, it can be assumed that role taking ability, social interactions, and conventionality, which are closely related to pretend play, are required for social competency.

Regarding social interactions, understanding the mind plays a crucial role (Lillard, 1998b). In order to understand social interactions, one should have an understanding of mental states (Perner, 1988b). Theory of mind plays a vital role in children's lives in order to communicate effectively in community. Children must be aware of the fact that different people may hold different opinions and beliefs and the knowledge they have is subject to alteration over time. To access to the mental worlds of others to find out what they know, believe, and desire, children rely on the communication processes. These processes create a connection between mental worlds of others by transforming thoughts into messages (Beal, 1988). Inferring ideas regarding others and social situations, understanding others' actions, and guessing others' possible actions in case of certain circumstances are parts of our daily life (Heider, 1958). Inferring, understanding, and predictions are made possible through social interactions.

Connolly and Doyle (1984) examined the relationship between social competence and social fantasy play in preschool children. Naturalistic observations of children's social fantasy play were conducted throughout a free play period. Social competence measure consisted of teacher ratings of social competence, popularity, role-taking abilities, and observations of social performances. An examination of the relationship between social fantasy play and social competence while considering the likely effects of age, gender, IQ, and activity level, showed that children who often were involved with social fantasy play

were more socially competent, more socially capable, and more popular among their peers, as compared to those who did not often engage in social fantasy play. Children who often engaged in social fantasy play and represented several complex fantasy play transformations were more mature regarding their affective role-taking abilities. Because these results were obtained independent of the effects of age, gender, IQ, and level of social activity, it is clear that in the process of predicting social competencies, social fantasy play has a distinctive contribution. These findings propose that social fantasy play is the most significant predictor of abilities and capabilities evident in the social relations of the child.

Capage and Watson (2001) investigated the association between social-cognitive skills, aggression, and social competence. The findings supported the hypothesis that comprehension of the core concepts of a theory of mind and competent social behavior are associated. The results showed that when the effects of age, language comprehension, and teacher ratings of aggression were controlled, a significant relationship becomes apparent between production of forceful answers in a traditional social-problem solving task and false belief tasks performance. The findings of this study support the significance of the development of a theory of mind in children's social cognition. A negative relationship was found between the performance on the false belief tasks and teacher ratings of aggression. The results also indicated a negative relationship between more complicated understanding of false belief and forceful answers to interpersonal problems.

Another study conducted by Astington and Jenkins (1995) examined the relationship between the development of a theory of mind and social relations. Understanding higher levels of false belief understanding was found to be related to making mutual proposals and role assignments in pretend play. These findings support the hypothesis that children who have a better understanding of false belief are more aware that it is possible for their play partners to have different opinions or beliefs regarding the imaginary world. Findings from this study failed to find an association between false belief task performance and emphatic concerns. The authors suggested that it is possibly because comforting a crying friend does not require one to understand the mental state behind the emotional reaction.

Lalonde and Chandler (1995) examined the development of a theory of mind in 3-year-old children and its effects on their social-emotional competence. Children's theory of mind was assessed by using six measures of false belief understanding. Then, their social

competence was assessed by a standard format questionnaire completed by their teachers who had known the child who was being evaluated for no less than three months. The results showed that developing a theory of mind was related to children's social-emotional competence. Contrary to results of some studies, their findings also showed that developing a theory of mind did not have a 'legislative' influence on 3-year-olds' social-emotional competence as evaluated by teachers.

Charman and Campbell (2002) examined the relationship between theory of mind and social competence in children with a mental disability. According to the results, there was no significant correlation between performance on theory of mind tasks and social competence measures. The authors provided a possible explanation for these contradictory results by stating that using false belief tasks to examine theory of mind in children with typical development may be valid, but it may not be valid for those who have a mental disability. The authors referred to a possible explanation by Frith, Happé and Siddons (1994). According to Frith et al., 'mentalizing' social competence in children with mental disabilities is underrated by false belief tasks. Charman and Campbell (2002) stated that:

false belief tasks require information processing and performance abilities (e.g., working memory, rule-based reasoning, and executive abilities) besides an intact theory of mind has support from other work (Frye *et al.*, 1995; Gordon and Olson, 1998; Hughes, 1998); however, it is not clear in relation to individuals with a mental handicap in which domain any particular impairments might lay. Of course, the particular aspects of any task that are difficult may differ between different individuals with a mental handicap. (p. 272)

Dawson and Fernald (1987) tested children with autism to examine the relationship between perspective taking ability and social behavior. Sixteen children with autism were tested by utilizing three kinds of perspective-taking tasks (perceptual, conceptual, and affective). In addition to perspective-taking tasks, *The Peabody Picture Test*, *The Leiter International Performance Scale*, *The Vineland Social Maturity Scale*, and *Social Behavior Rating Scale* were utilized. Quality of social behavior of children with autism and the severity of autistic symptoms were found to be associated. The results also revealed that perspective-taking ability predicted the level of social skills better than measures of receptive vocabulary and nonverbal intelligence. However, the authors failed to acknowledge the

possible existence of a causal link between these two abilities. Even though affective role taking was not associated with social abilities, it was related to severity of autistic symptoms.

In conclusion, the studies examined underline the fact that in order to be socially competent, understanding of others' thoughts, intents, and feelings is important. Understanding the mind and appreciation of the fact that people may have different opinions serves as a foundation for social interactions. It is only possible through social interactions to infer, comprehend, and predict others' actions (Beal, 1988; Heider, 1958; Meichenbaum et al., 1981). In this section, the effects of developing a theory of mind and engaging in pretend play on children's social competence were examined.

Summary

It is evident from the above discussion that developing a theory of mind plays a crucial role in the lives of young children. For instance, a child with a well-developed theory of mind can make distinctions between deliberate and unintentional actions, between reality and beliefs and understand that internal mental states such as beliefs, intentions, and desires rule people's behavior. Reaching awareness that human actions are the results of these mental concepts and elucidating and forecasting others' behavior can be achieved by developing a mature theory of mind. Many researchers have examined the development of a theory of mind from different perspectives. While some researchers perceive theory of mind as an 'implicit naïve theory,' others recognize it as an ability obtained via role taking or as a matter of neurological maturation. Although researchers have not reached a consensus about how children develop a theory of mind, research suggests that the inability to develop an adult-like theory of mind can result in some serious deficiencies such as autism and social incompetence (Baron-Cohen, 1987; Moore & Frye, 1991; Wellman, 1992; Wimmer & Perner, 1983). The results of many studies (e.g., Happé, 1994; Perner et al., 1989) have shown that children with autism lack the ability to take mental states into account. The review of research suggests that because perceptions of mind across cultures are different, one should take cultural variations in theory of mind into account to obtain a better understanding of the development of a theory of mind. Therefore, examining cultural and demographic variations (e.g., maternal education, parenting styles, number of siblings etc.)

will provide more accuracy for researchers who examine the development of a theory of mind. While theory of mind is related to socio-cultural factors, the research reviewed in this chapter reveals that theory of mind is also related to pretend play and children's social competence. By taking turns, taking roles, and utilizing mental representations, pretend play provides a suitable environment for developing a theory of mind and social competence. Children who engage in pretend play improve their social competency and theory of mind (Connonly & Doyle, 1984; Harris, 2000).

An important conclusion is that many of the studies concerning theory of mind have found it to be related to pretend play. Some of the studies regarding pretend play examined its effect on social competence. This would indicate a need for studies that focus on theory of mind and its effect on pretend play and social competence. Thus, this study was designed to examine all these three components (theory of mind, pretend play, and social competence) in a single study to obtain a comprehensive perspective on how these components are related.

CHAPTER III

RESEARCH METHODS

The purpose of this study was to explore the relationship between children's theory of mind, symbolic transformations (object and ideational transformations) in pretend play, and their social competence. In this study, four theory of mind tasks were administered to each child. In accordance with their theory of mind scores, preschool children were categorized as *low* or *high*. Then, the children were assigned into same-gender dyads (*low-low* and *low-high*) in order to engage in pretend play. The dyads were observed during the episode of pretend play. Children's symbolic transformation scores were obtained by using Matthews' (1977) classification of symbolic transformations in pretend play. Comparison between symbolic transformations of a child in *low-low* and *low-high* dyads was obtained. Finally, the associations between children's theory of mind scores, symbolic transformation scores, and social competence scores were examined. In the within-subject design, two levels of peer context (dyads: *low-low* versus *low-high*) were compared. In addition, the time of observation consisting of two levels (twice in *low-low* and twice in *low-high*) were compared.

In the first part of this chapter, information on the participants and setting is provided. Then, as an introduction to the detailed research design, information on the within-subject, between-subject, and outcome variables are presented. This chapter continues with a description of the procedures for training of the coder, coding procedure, and interrater reliability. The second part of this chapter begins with information on data collection. This is followed by an inclusive explanation of instruments employed in the study. Finally, the statistical procedures that were used to analyze the data for each of the hypotheses are described and explained.

Method

Participants

Based on parental consent forms, a total of 47 children (26 females and 21 males) participated in the study. The participants' mean age at the start of the study was 52 months. According to the directors of the childcare centers, the participants were mostly from high income families. Two percent of the children were African American, 2% were Asian American, and 96% were Caucasian American. Theory of mind (ToM) tasks were administered to the participants, and the resulting data were used to classify each child as *low* or *high*. Those students who scored *low* on the ToM tasks were then paired with each other to form *low-low* dyads. Those students who had scored *low* on the theory of mind tasks were also paired with students who scored *high* on the theory of mind tasks to form *low-high* dyads.

Settings

The data were collected from five private childcare centers that serve an urban community. In two of the childcare centers, combinations of dyads that were necessary for this study could not be obtained. Therefore, in these two centers pretend play sessions could not be conducted. According to the directors, one of these childcare centers provides childcare for young children of high income families, while the other one provides out of home care for children of middle income families.

The observations of pretend play episodes for this research were conducted in three private childcare centers as follows:

Setting #1: This center, according to the director, provides childcare for young children of high income families. Ninety-eight children (forty-four 3 years olds and fifty-four 4 years olds) were enrolled in this childcare at the time this study was conducted. A total of eight children from this childcare center participated in the pretend play sessions. Data collection took place in the socio-dramatic play area which was a part of the regular classroom, rather than a separate room. The width of the socio-dramatic play area was six feet, eight inches and the length was 10 feet, two inches. The play area had the following items: a cash register, two plastic phones, costumes (i.e., police, firefighter, doctor, and princess), several baby dolls (Black, White, Hispanic, and Asian dolls), miniature play food, a cooking set including tea kettle with lid, saucepan, frying pan, strainer and ladle, a

luncheon including teapot, four cups and saucers, plates, sugar bowl and creamer, kitchen utensils, furniture such as bookcase, refrigerator, stove, and washing machine, a toy camera, and a table with four chairs.

Setting #2: This center, according to the director, provides childcare for young children of middle income families. One hundred and forty-eight children (forty-four 2 years olds and forty-eight 3 years olds, thirty-nine 4 years olds, and seventeen 5 years olds) were enrolled in this childcare at the time this study was conducted. A total of eight children enrolled in this childcare center participated in the pretend play sessions. Data collection took place in the socio-dramatic play area, which was a part of the regular classroom rather than a separate room. The width of the socio-dramatic play area was five feet, 10 inches and the length was 10 feet, 10 inches. The play area had the following items: a cash register, a plastic phone, a wooden phone, costumes of firefighter and doctor, several baby dolls (Black, White, Hispanic and Asian dolls), miniature play food, a cooking set including tea kettle with lid, saucepan, frying pan, strainer and ladle, a microwave, a luncheon including teapot, several cups and saucers, plates, sugar bowl and creamer, kitchen utensils, furniture such as bookcase, closet for clothes, stove, and refrigerator, and a table with four chairs.

Setting #3: This center, according to the director, provides childcare for young children of high income families. Forty-two children (eight 1 year old, sixteen 3 years olds, eight 4 years olds, and ten 5 years olds) were enrolled in this childcare center at the time this study was conducted. A total of nine children who were enrolled in this childcare center participated in the pretend play sessions. This childcare center had a separate socio-dramatic playroom, which had a width of 10 feet, five inches and a length of 15 feet, 10 inches. The play room had the following items: two cash registers with stands (one of them had a stand with mirror), money for cash register, two plastic phones, costumes (i.e., police, firefighter, doctor, and princes), several types of hats, several baby dolls (Black, White and Hispanic dolls), miniature play food, a cooking set including tea kettle with lid, saucepan, frying pan, strainer, and ladle, a luncheon including teapot, four cups and saucers, plates, sugar bowl and creamer, kitchen utensils, microwave, two mirrors, a broom, dresser, two big storage cabinets, kitchen shelves, bookcase, refrigerator, a table with four chairs, and a child sized sofa.

Research Design

A repeated measures design was employed for several reasons. First, subject heterogeneity (i.e., individual differences) was controlled by using such design. Each individual provides his or her own control in a repeated measures design. Identification of variance because of individual differences is possible in such a design. As a result, utilizing a repeated measures design permitted greater accuracy regarding data analysis. Second, compared to a completely randomized design, utilizing a repeated measure design was economical with respect to the number of subject necessary for the study (Keppel, 1982; Pedhazur, 1982).

Within-subject variables. The within-subject variable was the time of observation consisting of two levels (twice in the *low-low* context and twice in the *low-high* context). The second within-subject variable was peer context (i.e., *low-low* vs. *low-high*).

Between-subjects variable. The between subjects variable was two levels of gender.

Outcome variables. The outcome variables used in this study were symbolic transformations in pretend play and social competence. There were six categories of symbolic transformations in pretend play (*animation, attribution of function, substitution, insubstantial material attribution, insubstantial situation attribution, and role attribution*) and four categories of social competence (*social skill total, problem behavior total, social skill percentage, and problem behavior percentage*).

Procedure

Before conducting the present study, approval was obtained from the Florida State University Institutional Review Board for research involving human subjects. In order to obtain permission for the study, the principals of the schools were contacted by phone to make an appointment. One principal refused to give permission for the study and five gave permission for collecting data from their childcare centers. At the first meeting with the principals, the purpose of the study and information on data collection were explained. Parent consent forms were delivered through school officials to parents whose children were four years old. Parental consent forms were obtained in the first two weeks. In the third week, teachers were asked to complete the *Social Skill Rating Scale* (Gresham & Elliott, 1990) and application of theory of mind tasks started. The following

week, the application of theory of mind tasks to 47 preschool children was finished. The resulting data were used to create 16 dyads (eight dyads of boys and eight dyads of girls). Then, according to their theory of mind scores, dyads were created and observation of pretend play sessions was conducted. These play episodes were videotaped for later coding and analysis by the researcher. The teachers completed the *Social Skills Rating Scale* at the beginning and at the end of the data collection. Further details concerning these procedures are presented in the following section.

During the third and fourth week of data collection, four theory of mind tasks (1) change in location, (2) appearance-reality, (3) unexpected contents, and (4) misleading picture were administered to each child. Data from the theory of mind tasks were used to determine the participants' level of theory of mind ability. The theory of mind tasks were administered in an experimental playroom. Each child was asked seven questions. Children earned "1" point for each answer that was correct and "0" point for the answer that was not correct. Each child's total theory of mind score was computed by adding up their correct answers. After administering four theory of mind tasks, the children were grouped into two categories according to their total theory of mind scores: *low* and *high*. The reason for categorizing children's theory of mind scores as *low* and *high* was based on the theoretical basis of this study. In order to understand if children perform better when they play with more skilled peers, categorization of *low* and *high* was necessary to match children with similar versus dissimilar ToM scores. Children with *low* ToM scores were considered as "less skilled peers" while children with *high* ToM scores were considered as "more skilled peers." Without this categorization, it would not have been possible to match children with more or less skilled peers.

In her study, Lundy (2002) grouped children with scores on theory of mind tasks of 5 or higher out of 9 as "passers," and 1 to 4 as "failers." In this current study, children who scored three or lower were labeled as *low* and four or higher were labeled as *high*. After obtaining the theory of mind scores from all participants, the children were grouped into same-gender dyads. Children who scored *low* on the theory of mind tasks were paired with other same gender children who had also scored *low* on the theory of mind tasks to form *low-low* dyads. Then, the same children who scored *low* on the theory of mind tasks were also paired with same gender children who had scored *high* on the

theory of mind tasks. Thus, there were two types of dyads: a dyad of children who scored *low* (*low-low*) and a dyad consisting of a child who scored *low* and a child who scored *high* (*low-high*) on the theory of mind tasks. Based on Vygotsky's (1978) notion of Zone of Proximal Development, it was assumed that children who engage in pretend play with a more skilled peer (in this case a child with *high* score on ToM tasks) would represent higher level of symbolic transformations.

Children's play sessions were recorded by using a video camera. For the pretend play sessions, the appropriate props were set out on the floor. The Teacher Behavior Continuum (Wolfgang & Wolfgang, 1999) was adjusted to help children engage in pretend play. The experimenter was seated close to the cashier register. The shopping cart and miniature vegetables were placed in front of the children. The experimenter said: "*Oh, I see that today is a shopping day. Who is going to be the check-out teller and who is going to be the shopper?*" The experimenter stopped for a moment to wait for the children's answer. After the children decided who was going to be the teller and the shopper, the experimenter told the teller that "*(name of the child) is going to buy these vegetables.*" Then, while looking at the shopper, the experimenter said "*(name of the child), open your purse and take out three dollars, and pay the teller.*" Without being involved in pretend play as a "player," the experimenter said, "*now, I am going to sit at the back of the classroom but I want you to continue playing.*"

Four separate play sessions, each one approximately 15 minutes, were conducted. A video camera operated in the playroom. The time period that was used for the coding started 5 minutes after the experimenter was finished with the Teacher Behavior Continuum process. An action was taken to avoid possible Hawthorne effects. The Hawthorne effect refers to the possibility that "behavior during the course of an experiment can be altered by a subject's awareness of participating in the experiment" (Jones, 1992, p. 451). Prior to the actual videotaping, a video camera was placed in the classroom for several days, as if it was on, so that children would become accustomed to being video taped prior to data collection.

Training of the coder

The author coded the symbolic transformations in pretend play sessions. Before starting actual videotaping, the author videotaped children's pretend play sessions to be

used for training purposes. These tapes were not used for actual coding. There were 5 sessions of training of a second coder. During the training sessions, the researcher and second coder observed the play episodes. Both the researcher and second coder coded the play sessions. Then, reliability was determined by computing the *kappa* coefficient. A *kappa* coefficient of .75 or higher was determined as the critical value for training purposes. Training continued until this level of reliability was obtained (i.e., *kappa* = .75).

Coding procedure

The utterances of children during pretend play were coded according to Matthews' (1977) object transformation and ideational transformation categories. Following Pellegrini's (1987) study, transformation scores were represented in relative frequencies. Calculating relative frequencies involved dividing the total occurrences of a particular subcategory by the sum of all occurrences for that dyad.

Interrater reliability

In this study, interrater reliability was determined by computing Cohen's *kappa* coefficient (Cohen, 1960). Despite the fact that percentage of agreement is the most popular statistics to calculate interobserver agreement, it allows for potential chance agreement. That is, percentage of agreement disregards the possibility of agreement resulting from chance observations (Berk, 1979 as cited in Watkins & Pacheco, 2000). Cohen's *kappa* (Cohen, 1960), however, takes chance agreement between interobservers into consideration (Watkins & Pacheco, 2000). With the purpose of establishing interrater agreement, a second rater coded 10 percent of the total number of observations. Cohen's *kappa* was .81. The following table provided by Landis and Koch (1977) shows the interpretation of *kappa* values:

<u><i>Kappa Statistics</i></u>	<u><i>Strength of Agreement</i></u>
<0.00	Poor
0.00-0.20	Slight
0.21-0.40	Fair
0.41-0.60	Moderate
0.61-0.80	Substantial
0.81-1.00	Almost Perfect (p. 165, italics in original).

A child with *low* ToM score (X_{1Low}) was paired with another child who had a *low* ToM score (X_{2Low}) for the first observation. Then, the same child (X_{1Low}) was observed in a dyad with a child with *high* ToM score (Y_{1High}). For the third observation, the child (X_{1Low}) was paired with the child with *low* ToM score (X_{2Low}). Finally, for the fourth observation, the child (X_{1Low}) was in a dyad with the child with *high* ToM score (Y_{1High}).

Time 1 (<i>Low-Low</i>)	Time 2 (<i>Low-High</i>)	Time 3 (<i>Low-Low</i>)	Time 4 (<i>Low-High</i>)
$X_{1Low} X_{2Low}$	$X_{1Low} Y_{1High}$	$X_{1Low} X_{2Low}$	$X_{1Low} Y_{1High}$
$X_{2Low} X_{1Low}$	$X_{2Low} Y_{2High}$	$X_{2Low} X_{1Low}$	$X_{2Low} Y_{2High}$

To assess the social competence of the participants, the *Social Skills Rating Scale* (SSRS) was utilized. The SSRS asks teachers and/or parents to rate children's social skills in terms of cooperation, assertion, responsibility, empathy, and self-control (Gresham & Elliot, 1990). According to teachers, completing each questionnaire took approximately 15 minutes. For reliability purposes teachers completed the SSRS at the beginning of the study and at the end of the study. The test-retest reliability for the SSRS was 80%.

Data Collection

The four theory of mind tasks and the SSRS were administered for each participant during the third and fourth week. Participants were then grouped as *low* and *high* according to their total theory of mind scores. During the subsequent weeks four pretend play sessions were conducted for each child. The play sessions were recorded by using a video camera. Then, during the final week, the teachers completed the SSRS a second time for each child.

Selection of Instruments

Theory of mind tasks. Each child was presented with four theory of mind tasks which were (1) change in location, (2) appearance-reality, (3) unexpected contents, and (4) misleading picture. The theory of mind tasks procedures primarily followed Lundy's (2002) study, as did the wording in theory of mind questions.

1. *Change in location task.* Each child received the change in location task similar to the one used by Wimmer and Perner (1983). There were two experimenters, Ann and Sandy. Two different color containers (red and white) were shown to the child. One of

the experimenter, Ann, put the candy in red box. After that, she left for a minute by saying “*I will be right back.*” Then, the child was asked two control questions: “*Where did Ann put her candy?*” and “*Where is Ann’s candy now?*” The process was repeated if the child responded these questions incorrectly. If the child was still unable to give the correct answers, the child was told the correct answer. After obtaining the correct answers, Sandy, who was with the child, removed the candy from red box and put it in white box. Ann returned to the room and the child was asked following question (#1) in two sentences with no pause in between: “*Where does Ann think the candy is? Where will Ann go first to look for her candy?*”

2. *Appearance reality task.* The name of the child’s friend was obtained before starting the application of this task. Two objects that were sponges but appeared to be rocks were shown to the child. Then, the child was asked to identify these objects. After his or her answer, the objects were given to the child to hold, squeeze, and the child was asked to identify these objects again. The word “sponge” was provided if the child was unfamiliar with this word or it was not in his or her vocabulary. The child, then, was asked following question (#2) containing two sentences with no pause in between: “*What did you first think these were? Before you touched them, what did you think they were?*” After that, another question (#3) was asked: “*if your friend, _____, came into the room right now, what would he or she think these are?*”

3. *Unexpected contents task.* A band-aids box was presented to the child and then, the child was asked about what he or she thought was inside. After receiving the child’s answer, the child had a chance to take a look at what was inside of it. The child discovered short pencils inside of the box instead of expected band-aids. Following question (#4) in two sentences with no pause was asked to the child: “*What did you first think was inside? Before you opened this box, what did you think was inside?*” Next question (#5) was as follows: “*What would your friend, who hasn’t looked inside, think is in the box?*”

4. *Misleading picture task.* A six-page book used by Astington and her colleagues (e.g., Astington & Jenkins, 1995; Gopnik & Astington, 1988; Jenkins & Astington, 1996) that included a series of pictures was utilized for this task. On the first page of this book, there was what appeared to be a drawing of ears. The child was asked to identify what

this drawing was part of. After obtaining the answer, second page that showed the whole picture of a dog was revealed. Then, the child was shown what appeared to be a drawing of a rabbit's ears. After that, the following page that showed the whole picture of a rabbit was revealed. A drawing appeared to be a cat's ears on the page five was shown to the child and was asked to identify what it was. After the child's answer, the last page was shown. By doing so, it was understood that what appeared to be a cat's ears was petals of a flower. After bringing child's attention to the page five that had what appeared to be a cat's ears, following questions were asked: (Q#6) "*What did you first think this was?*" and (Q#7) "*What would your friend, who saw only this picture think it is?*" (Lundy, 2002).

Symbolic transformations in pretend play. Matthews' (1977) object transformation and ideational transformation categories were used to code the utterances of children during pretend play. Because Matthews (1977) did not clarify the order of categories of symbolic transformations from less complex to more complex, in this current study the order used by McLoyd (1980) was utilized.

Object modes of transformation subcategories

The child's verbal ascription of a make-believe property or identity to a real referent is the main component of the object modes of transformation. These modes are categorized as object modes of transformations because of the child's manipulation of real material that exists in the present play area. The following are the subcategories of the object modes of transformation.

1. *Animation:* Ascribing living features to a non-living object. For example: a child says about a doll "my baby is hungry."
2. *Attribution of function:* Ascribing a functional feature to an object with no possession of that feature. For instance: a child with a toy video-camera says to his or her parents "I am videotaping you, okay?" In this example, the child ascribes a feature of a real video camera to the toy video camera.
3. *Substitution:* Giving a new identity to an existing object. A child says about a thick block "here is my truck" (Matthews, 1977; McLoyd, 1980).

Ideational transformation subcategories

Unlike the object modes, ideational transformations require ideas or mental images of objects that are not present at least in the present play area. An abstraction, idea, or theme, which is comparatively independent of any existing material, is entailed in ideational modes. The following are subcategories of ideational transformation:

4. *Insubstantial material attribution*: It requires make-believe that an unreal/imaginary object exists. It involves reference to material that either does not exist or does not exist in the present play area.
5. *Insubstantial situation attribution*: It takes place when someone pretends that an imaginary situation exists. For example, a child says, “we have arrived the airport” after pretending to be in a taxi by sitting on a table.
6. *Character/Role attribution*: Depiction of a make-believe role or character (e.g., a policeman, a nurse, a mother, a super hero etc.). For example, a child says to his or her friend “I will be the teacher while you will be the student” (Matthews, 1977; McLoyd, 1980).

Subcategories of the object and ideational modes of transformation listed by McLoyd (1980) are hierarchical. That is to say, *animation* is simpler compared to *role attribution* (Pellegrini, 1991). As for the reliability of the classification, by utilizing Cohen’s (1960) technique for nominal scaling, Matthews (1977) obtained coefficient of agreement of .87.

Social competence. The *Social Skills Rating Scale* (SSRS) developed by Gresham and Elliot (1990) was utilized to assess children’s social competence. The SSRS measures children’s social skills in terms of cooperation, assertion, responsibility, empathy, and self control. The main purpose of the SSRS is to help professionals to identify children who are suspected of having considerable social behavior problems. Items in the SSRS are culturally sensitive as they are analyzed for bias. Forms are available for the teacher, parent, and student. In this study, the teacher form was used. Teachers were requested to indicate how students display specific social skills. The questionnaire asks teachers to indicate the frequency of exhibition of certain social skills or problem behaviors for each child. The SSRS includes a checklist to assess children's social skills on a three-point scale: 0 (indicating that the child *never* exhibits the

described behavior), 1 (indicating that the child *sometimes* exhibits the described behavior), and 2 (indicating that the child exhibits the described behavior *very often*). The teacher form consists of two sections: Social Skills (e.g., “Makes friends easily”) and Problem Behaviors (e.g., “Has temper tantrums”). This questionnaire included items such as the following:

Gives compliments to peers.

Invites others to join in activities.

Argues with others.

Appears lonely.

Internal consistency coefficients for the teacher form (preschool) range from .74 to .94. Test-retest reliability coefficients for the teacher form range from .75 to .93. The SSRS is valid in terms of intercorrelations, content, construct, and concurrent (Gresham & Elliott, 1990; SSRS Assessment Services, 2004).

Data Analysis

A repeated measure design of 2 X 2 X 2 was used. An Analysis of Variance (ANOVA) of time (2) X peer context (2) X gender (2) was conducted to compare the difference of each child’s score on theory of mind tasks, symbolic transformations in pretend play, and social competence. Peer context had two levels: level one is *low-low* and level two is *low-high*.

Each of the hypotheses was tested as follows:

Hypothesis 1. There will be a statistically significant difference in the means of the symbolic transformations of dyads with similar theory of mind ability and dyads with different theory of mind ability. This hypothesis was tested by using an *F* test derived from a repeated measures analysis of variance (ANOVA). A *p*-value and index of “effect size” (η^2) were computed, and used to make a judgment concerning rejecting or failing to reject the null hypothesis.

Hypothesis 2. There will be a statistically significant correlation between children’s theory of mind scores and their symbolic transformation scores. This hypothesis was tested by computing the Pearson Product Moment correlation coefficient for the children’s theory of mind scores and their symbolic transformation scores.

Hypothesis 3. There will be a statistically significant correlation between children's theory of mind scores and their social competence scores. Testing this hypothesis involved computing the Pearson Product Moment correlation coefficient and testing the significance of the coefficient.

Hypothesis 4. There will be a statistically significant correlation between children's symbolic transformation scores and their social competence scores. This hypothesis was tested by computing the Pearson Product Moment correlation coefficient and testing the significance of the coefficient.

Hypothesis 5. There will be a statistically significant difference in the means of the symbolic transformation score obtained by children in the initial play episodes and subsequent play episodes. This hypothesis was tested by using an F test derived from a repeated measures analysis of variance (ANOVA). A p -value and index of *effect size* (η^2) were computed, and used to make a judgment concerning rejecting or failing to reject the null hypothesis.

Hypothesis 6. There will be a statistically significant difference in the means of the symbolic transformation scores obtained by dyads of boys and dyads of girls. This hypothesis was tested by using an F test derived from a repeated measures analysis of variance (ANOVA). A p -value and index of *effect size* (η^2) were computed, and used to make a judgment concerning rejecting or failing to reject the null hypothesis.

In this chapter, information on the participants, setting, and research design was provided. It was followed by a detailed description of the procedures and data collection. The instruments to assess theory of mind, symbolic transformations in pretend play and children's social competence were also described. Finally, the statistical procedures that were employed to analyze the data for each of the hypotheses were presented.

CHAPTER IV

RESULTS

This chapter presents the results of the study conducted to examine the relationship between theory of mind, symbolic transformations in pretend play, and children's social competence. Specifically, the study examined the effects of theory of mind ability on children symbolic transformations in pretend play. The effects of peer context on symbolic transformations in pretend play was also examined. This study also examined the effects of theory of mind ability on children's social competence. Data regarding theory of mind and social competence were collected from 47 four-year-old children. The participants were presented with four theory of mind tasks to measure their theory of mind status. The resulting data were then used to categorize the participants as *low* or *high* on the theory of mind tasks. Those children who were categorized as *low* were paired with a same gender child who scored *low* on the theory of mind tasks (the *low-low* context). Then, the same children were also paired with a same gender child who scored *high* on the theory of mind tasks (the *low-high* context). These paired dyads, *low-low* and *low-high*, were observed on four separate occasions, twice in the *low-low* context (i.e., both peers scored *low* on the theory of mind tasks), and twice in the *low-high* context (i.e., one peer scored *low* and one peer scored *high* on the theory of mind tasks). Children's symbolic transformations in pretend play were recorded and subsequently analyzed.

The statistical analyses were conducted using the computer package SPSS (Release 10). The results of the analyses, in the form of descriptive statistical analyses and inferential statistical analyses are reported in this chapter.

The chapter is organized into four main sections. In the first section, the results of analyses conducted to determine whether there were any significant differences in the scores of children across the different preschool settings that were used in the study are

presented. Then, in the second section, descriptive statistics regarding the theory of mind measures are presented. Statistical analyses and results for the research hypotheses (Hypotheses 2-3) are also presented in this section. In the third section, descriptive statistics with regard to symbolic transformations in pretend play are reported. This is followed by statistical analyses and results for the research hypotheses (Hypotheses 1, 5, and 6). In the fourth section, descriptive statistics related to social competence are presented. Statistical analysis and results for Hypothesis 4 are also presented in this section.

There were ten outcome variables used in this study: six categories of symbolic transformations in pretend play, and four categories of social competence. The reader is reminded that there were six research hypotheses.

Hypothesis 1. There will be a statistically significant difference in the means of the symbolic transformations of dyads with similar theory of mind ability and dyads with different theory of mind ability.

Hypothesis 2. There will be a statistically significant correlation between children's theory of mind scores and their symbolic transformation scores.

Hypothesis 3. There will be a statistically significant correlation between children's theory of mind scores and their social competence scores.

Hypothesis 4. There will be a statistically significant correlation between children's symbolic transformation scores and their social competence scores.

Hypothesis 5. There will be a statistically significant difference in the means of the symbolic transformation score obtained by children in the initial play episodes and subsequent play episodes.

Hypothesis 6. There will be a statistically significant difference in the means of the symbolic transformation scores obtained by dyads of boys and dyads of girls.

In order to test hypotheses 1, 5, and 6, a time (2) by peer context (2) by gender (2) repeated measures analysis of variance (ANOVA) was conducted for each of the symbolic transformation category. The between subjects grouping variable was two levels of gender (male vs. female). The within-subject variables were the time of testing (two levels) and two levels of peer context (i.e., *low-low* vs. *low-high*). The outcome

variables were six categories of symbolic transformations in pretend play and four categories of social competence.

Two indexes, a p -value and index of *effect size* (η^2), were used to make decisions on whether to reject or fail to reject the various null hypotheses related to this design. A “small” value in concurrence with a “large” index of *effect size* (η^2) was regarded as sufficient evidence to reject the related null hypotheses. Due to the exploratory nature of this study, and that previous research was not replicated, an *effect size* of .1 or more was considered *large*. In addition, a p -value of .05 or less was considered *small*. However, a series of analytical comparisons were performed on the data and therefore, there was an increased vulnerability to type I error (Keppel, 1991). Consequently, an effort was made to control familywise type I error. First, for the tests of standard factorial effects (i.e., the main effects and interactions) a p -value of .05 or less was defined as being *small*. Next, the familywise error rate was set as $\alpha = .2$ and an adjusted significance level (p -value), was calculated by dividing the familywise probability equally among all comparisons. Confirmation that the familywise error rate remained at or below .2 was obtained using the formula $\alpha_{fw} = 1 - (1 - \alpha)^c$; where c represent the number of comparisons conducted and α denotes the probability of type I error for each test.

Correlational analyses were also conducted to determine whether these were statistically significant relationships between the variables of interest as outlined in hypotheses 2, 3, and 4. Here, the Pearson Product Moment correlation coefficients were calculated.

The first series of analyses were conducted in order to determine whether there were any significant differences in the means of the symbolic transformations across the three sites where the study was conducted. Although an effort was made to create a similar environment within each classroom, there is a possibility that differences in the means could be associated with the settings where the play observations were conducted. An analysis of variance (ANOVA) was conducted for each category of the symbolic transformations. A series of analyses were conducted and therefore, there was increased vulnerability to type I error. The p -value was examined against an α of $.05/k$ where k refers to the number of analyses conducted. Further, decisions on whether to reject or fail to reject the null hypothesis was based on an alpha level of .008. The results of these

analyses are presented in Table 4-1. The findings suggest that there was a statistically significant difference for one measure only.

Table 4-1

ANOVA Source Table for Settings by Symbolic Transformations

	<i>SS</i>	<i>df</i>	<i>F</i>	<i>p</i> -value
Animation	.001	2	.255	.777
Attribution of Function	.355	2	17.390	.000
Substitution	.000	2	.310	.737
Insubstantial Material Attribution	.001	2	.372	.693
Insubstantial Situation Attribution	.048	2	3.763	.039
Role Attribution	.024	2	1.006	.382

Theory of Mind

Descriptive statistics. First, descriptive statistics including means and standard deviations for theory of mind total score by gender were calculated. These descriptive statistics are reported in Table 4-2. The data were examined to determine whether the values for the each variable were normally distributed. Based on an examination of stem-and-leaf plots, and normal probability plots, it was judged that the scores approximated a normal distribution.

The descriptive statistics show that girls' theory of mind scores ($\underline{M} = 4.23$) were higher than boys ($\underline{M} = 3.48$). A *t*-test was conducted to determine whether the differences in the means were statistically significant. The results of this analysis are reported in Table 4-3.

Table 4-2

Means and Standard Deviations for Theory of Mind Total Score by Gender

Gender	<i>n</i>	<i>M</i>	<i>SD</i>
Female	26	4.23	1.861
Male	21	3.48	2.228
Total	47	3.89	2.046

Table 4-3

Summary of t-test Results for Theory of Mind by Gender

	<i>n</i>	<i>F</i>	<i>t</i>	<i>df</i>	<i>p</i> -value	Mean Difference
Theory of Mind Total	47	1.954	1.266	45	.212	.755

The results, as shown in Table 4-3, indicated that the difference between theory of mind total scores of male and female children was not statistically significant.

Before conducting the analyses for theory of mind, the descriptive statistics (Table 4-2) were examined to determine if the variances were homogenous. Examining the results of the Levene statistics showed that there was no violation of this assumption. Based on an examination of stem-and-leaf plots, and normal probability plots, it was judged that the scores approximated a normal distribution.

Results by Hypotheses. There were two research hypotheses with regard to theory of mind. For ease of reader interpretation, the hypotheses are listed followed by a summary of the statistical analyses to test the two hypotheses.

Hypothesis 2. There will be a statistically significant correlation between children's theory of mind scores and their symbolic transformation scores. In order to test this hypothesis, the Pearson Product Moment correlation coefficient was computed for the children's theory of mind scores and their symbolic transformation scores.

Hypothesis 3. There will be a statistically significant correlation between children's theory of mind scores and their social competence scores. In order to test this hypothesis, the Pearson Product Moment correlation coefficient was computed for the children's theory of mind scores and their social competence scores.

The results of the correlational analyses are presented in Table 4-4. The results provided partial support for Hypothesis 2. The results, reported in Table 4-4, show that there was a statistically significant correlation between theory of mind and *role attribution* ($r = .560, p = .004$) while there was no statistically significant correlation between theory of mind and *animation* ($r = -.174, p = .406$), *attribution of function* ($r = .170, p = .418$), *substitution* ($r = -.152, p = .468$), *insubstantial material attribution* ($r =$

-.029, $p = .891$), and *insubstantial situation attribution* ($r = .096$, $p = .648$).

The results related to Hypothesis 3, that there would be a statistically significant correlation between children's theory of mind scores and their social competence scores, are reported in Table 4-5. Hypothesis 3 was not supported by the data because there was not a statistically significant correlation between theory of mind and social competence measures.

Table 4-4

Intercorrelations Between Theory of Mind and Symbolic Transformations

	1	2	3	4	5	6	7
1. Theory of Mind	-	-.174 (.406)	.170 (.418)	-.152 (.468)	-.029 (.891)	.096 (.648)	.560** (.004)
2. Animation		-	-.119 (.573)	-.193 (.356)	-.229 (.270)	.256 (.218)	-.261 (.208)
3. Attribution of Function			-	-.155 (.459)	-.156 (.458)	-.548** (.005)	-.265 (.200)
4. Substitution				-	.125 (.551)	-.131 (.533)	-.270 (.191)
5. Insubstantial Material Attribution					-	.017 (.937)	.033 (.876)
6. Insubstantial Situation Attribution						-	.073 (.728)
7. Role Attribution							-

Note. ** Correlation is significant at the 0.01 level.

Symbolic Transformations

Descriptive Statistics. Descriptive statistics related to symbolic transformations in pretend play are reported in Table 4-6 through Table 4-11. Descriptive statistics of symbolic transformations by peer context, time and gender are reported in Table 4-12 through 4-17.

Before conducting the analysis for symbolic transformations, the descriptive statistics (Table 4-6 through 4-17) were examined to make a judgment concerning the assumption of homogeneity of variances. Based on an examination of stem-and-leaf

plots, and normal probability plots, it was judged that the scores approximated a normal distribution. The data were also analyzed using Mauchly's test of sphericity, so that a judgment could be made regarding the assumption of sphericity. In this case, the hypothesis of sphericity was rejected. Therefore, the assumption of sphericity appeared to be violated. A potential implication is that the F ratios may not be correct. Consequently, a decision was made to use the conventional analytical approach for ANOVA. Then, for those effects that appeared significant, the numerator and denominator degrees of freedom associated with the F statistic were adjusted by multiplying their values of Huynh-Feldt Epsilon (Huynh & Feldt, 1976). The significance of the F ratio was then re-evaluated with the new degrees of freedom values.

Table 4-5

Intercorrelations Between Theory of Mind and Social Competence Measures

	1	2	3	4	5
1. Theory of Mind Total	-	.296 (.152)	.228 (.272)	.168 (.422)	.306 (.137)
2. Social Skill Total		-	-.010 (.961)	.564** (.003)	-.022 (.919)
3. Problem Behavior Total			-	-.193 (.355)	.780** (.000)
4. Social Skill Percentage				-	-.302 (.143)
5. Problem Behavior Percentage					-

Note. ** Correlation is significant at the 0.01 level.

Table 4-6

Relative Means and Standard Deviations for 'Animation' by Gender

Gender		Animation (time 1)	Animation (time 2)	Animation (time 3)	Animation (time 4)	Animation (Total)
Female	<i>M</i>	.039	.017	.006	.000	.017
	<i>n</i>	13	13	11	11	13
	<i>SD</i>	.081	.038	.019	.000	.024
Male	<i>M</i>	.000	.073	.009	.026	.025
	<i>n</i>	12	12	10	10	12
	<i>SD</i>	.000	.159	.029	.032	.038
Total	<i>M</i>	.020	.044	.007	.012	.021
	<i>n</i>	25	25	21	21	25
	<i>SD</i>	.060	.115	.024	.025	.031

Table 4-7

Relative Means and Standard Deviations for 'Attribution of Function' by Gender

Gender		Attribution of function (time 1)	Attribution of function (time 2)	Attribution of function (time 3)	Attribution of function (time 4)	Attribution of function (Total)
Female	<i>M</i>	.353	.255	.176	.147	.264
	<i>n</i>	13	13	11	11	13
	<i>SD</i>	.235	.254	.158	.138	.189
Male	<i>M</i>	.256	.308	.363	.162	.286
	<i>n</i>	12	12	10	10	12
	<i>SD</i>	.201	.178	.131	.118	.116
Total	<i>M</i>	.307	.281	.265	.154	.275
	<i>n</i>	25	25	21	21	25
	<i>SD</i>	.220	.218	.171	.126	.155

Table 4-8

Relative Means and Standard Deviations for 'Substitution' by Gender

Gender		Substitution (time 1)	Substitution (time 2)	Substitution (time 3)	Substitution (time 4)	Substitution (Total)
Female	<i>M</i>	.009	.011	.005	.005	.007
	<i>n</i>	13	13	11	11	13
	<i>SD</i>	.033	.040	.018	.016	.015
Male	<i>M</i>	.007	.000	.004	.047	.012
	<i>n</i>	12	12	10	10	12
	<i>SD</i>	.024	.000	.013	.113	.029
Total	<i>M</i>	.008	.006	.005	.025	.010
	<i>n</i>	25	25	21	21	25
	<i>SD</i>	.029	.029	.015	.079	.022

Table 4-9

Relative Means and Standard Deviations for 'Insubstantial Material Attribution' by Gender

Gender		Insubstantial material attribution (time 1)	Insubstantial material attribution (time 2)	Insubstantial material attribution (time 3)	Insubstantial material attribution (time 4)	Insubstantial material attribution (Total)
Female	<i>M</i>	.046	.005	.021	.039	.025
	<i>n</i>	13	13	11	11	13
	<i>SD</i>	.102	.016	.054	.070	.031
Male	<i>M</i>	.000	.014	.031	.018	.016
	<i>n</i>	12	12	10	10	12
	<i>SD</i>	.000	.037	.061	.030	.022
Total	<i>M</i>	.024	.009	.026	.029	.021
	<i>n</i>	25	25	21	21	25
	<i>SD</i>	.076	.028	.056	.054	.027

Table 4-10

Relative Means and Standard Deviations for 'Insubstantial Situation Attribution' by Gender

Gender		Insubstantial situation attribution (time 1)	Insubstantial situation attribution (time 2)	Insubstantial situation attribution (time 3)	Insubstantial situation attribution (time 4)	Insubstantial situation attribution (Total)
Female	<i>M</i>	.162	.167	.204	.175	.169
	<i>n</i>	13	13	11	11	13
	<i>SD</i>	.126	.183	.121	.199	.107
Male	<i>M</i>	.100	.063	.098	.082	.089
	<i>n</i>	12	12	10	10	12
	<i>SD</i>	.091	.052	.090	.085	.031
Total	<i>M</i>	.132	.117	.153	.131	.131
	<i>n</i>	25	25	21	21	25
	<i>SD</i>	.113	.144	.118	.159	.089

Table 4-11

Relative Means and Standard Deviations for 'Role Attribution' by Gender

Gender		Role attribution (time 1)	Role attribution (time 2)	Role attribution (time 3)	Role attribution (time 4)	Role attribution (Total)
Female	<i>M</i>	.107	.197	.176	.239	.175
	<i>n</i>	13	13	11	11	13
	<i>SD</i>	.077	.165	.214	.186	.115
Male	<i>M</i>	.120	.067	.030	.127	.088
	<i>n</i>	12	12	10	10	12
	<i>SD</i>	.140	.113	.049	.229	.085
Total	<i>M</i>	.113	.134	.107	.186	.133
	<i>n</i>	25	25	21	21	25
	<i>SD</i>	.109	.154	.172	.210	.109

Table 4-12

Means and Standard Deviations for 'Animation' by Peer Context, Time, and Gender

Context	Time	Gender	<i>M</i>	<i>SD</i>	<i>n</i>
<i>Low-Low</i>	1	Female	.053	.099	8
		Male	.000	.000	8
		Total	.027	.073	16
	2	Female	.008	.022	8
		Male	.011	.032	8
		Total	.010	.027	16
<i>Low-High</i>	1	Female	.023	.048	8
		Male	.109	.187	8
		Total	.066	.139	16
	2	Female	.000	.000	8
		Male	.032	.033	8
		Total	.016	.028	16

Table 4-13

Means and Standard Deviations for 'Attribution of Function' by Peer Context, Time, and Gender

Context	Time	Gender	<i>M</i>	<i>SD</i>	<i>n</i>
<i>Low-Low</i>	1	Female	.262	.232	8
		Male	.292	.208	8
		Total	.277	.214	16
	2	Female	.206	.167	8
		Male	.386	.129	8
		Total	.296	.172	16
<i>Low-High</i>	1	Female	.173	.254	8
		Male	.251	.145	8
		Total	.212	.204	16
	2	Female	.106	.087	8
		Male	.203	.092	8
		Total	.155	.100	16

Table 4-14

Means and Standard Deviations for 'Substitution' by Peer Context, Time, and Gender

Context	Time	Gender	<i>M</i>	<i>SD</i>	<i>n</i>
<i>Low-Low</i>	1	Female	.015	.042	8
		Male	.010	.029	8
		Total	.013	.035	16
	2	Female	.007	.021	8
		Male	.000	.000	8
		Total	.004	.015	16
<i>Low-High</i>	1	Female	.018	.050	8
		Male	.000	.000	8
		Total	.009	.036	16
	2	Female	.007	.019	8
		Male	.013	.018	8
		Total	.010	.018	16

Table 4-15

Means and Standard Deviations for 'Insubstantial Material Attribution' by Peer Context, Time, and Gender

Context	Time	Gender	<i>M</i>	<i>SD</i>	<i>n</i>
<i>Low-Low</i>	1	Female	.072	.125	8
		Male	.000	.000	8
		Total	.036	.093	16
	2	Female	.028	.062	8
		Male	.011	.032	8
		Total	.020	.049	16
<i>Low-High</i>	1	Female	.007	.021	8
		Male	.000	.000	8
		Total	.004	.015	16
	2	Female	.046	.080	8
		Male	.014	.028	8
		Total	.030	.060	16

Table 4-16

Means and Standard Deviations for 'Insubstantial Situation Attribution' by Peer Context, Time, and Gender

Context	Time	Gender	<i>M</i>	<i>SD</i>	<i>n</i>
<i>Low-Low</i>	1	Female	.179	.147	8
		Male	.095	.101	8
		Total	.137	.129	16
	2	Female	.234	.121	8
		Male	.091	.099	8
		Total	.163	.130	16
<i>Low-High</i>	1	Female	.222	.216	8
		Male	.053	.056	8
		Total	.138	.176	16
	2	Female	.201	.225	8
		Male	.091	.091	8
		Total	.146	.176	16

Table 4-17

Means and Standard Deviations for 'Role Attribution' by Peer Context, Time, and Gender

Context	Time	Gender	<i>M</i>	<i>SD</i>	<i>n</i>
<i>Low-Low</i>	1	Female	.093	.096	8
		Male	.065	.086	8
		Total	.079	.089	16
	2	Female	.067	.076	8
		Male	.026	.049	8
		Total	.046	.065	16
<i>Low-High</i>	1	Female	.127	.139	8
		Male	.100	.128	8
		Total	.113	.130	16
	2	Female	.218	.192	8
		Male	.058	.077	8
		Total	.138	.164	16

Results by Hypotheses. There were three research hypotheses with regard to symbolic transformations. For ease of reader interpretation, the hypotheses are listed followed by a summary of the statistical analyses to test the hypotheses.

Hypothesis 1. There will be a statistically significant difference in the means of the symbolic transformations of dyads with similar theory of mind ability and dyads with different theory of mind ability.

Hypothesis 5. There will be a statistically significant difference in the means of the symbolic transformation score obtained by children in the initial play episodes and subsequent play episodes.

Hypothesis 6. There will be a statistically significant difference in the means of the symbolic transformation scores obtained by dyads of boys and dyads of girls.

In order to test these hypotheses, a time (2) X peer context (2) gender (2) repeated measures analysis of variance (ANOVA) was conducted for each of the symbolic transformation category. The within-subject variables were two levels of time and two levels of peer context (i.e., *low-low* vs. *high-low*). The between subjects variable was two levels of gender (male and female). The outcome variables used in this study were symbolic transformations in pretend play and social competence.

Two indexes, a *p*-value and index of *effect size* (η^2), were used to make decisions on whether to reject or fail to reject the various null hypotheses related to this design. A *small* value in concurrence with a *large* index of *effect size* (η^2) was regarded as sufficient evidence to reject the related null hypotheses. Due to the exploratory nature of this study, and that previous research was not replicated, an *effect size* of .1 or more was considered *large*. In addition, a *p*-value of .05 or less was considered *small*.

Table 4-18 provides a summary of the effects of peer context, gender, and time on *animation* (#1 category of symbolic transformations). The three-way interaction was judged nonsignificant. However, the analyses showed that there was a statistically significant context by gender interaction, $p = .042$, $\eta^2 = .265$. Further analysis examining this interaction showed that boys outperformed girls in the *low-high* context. There were no other significant two-way interactions. As reported in Table 4-18, the scores of symbolic transformations obtained in the *low-low* versus the *low-high* context were not significantly different, $F(1,14) = 1.506$, $p = .240$, $\eta^2 = .097$. Thus, Hypothesis 1 was not

supported. The difference in the symbolic transformation scores obtained by children in the initial play episodes and subsequent play episodes was not statistically significant, $F(1,14) = 2.354$, $p = .147$, $\eta^2 = .144$. Thus, Hypothesis 5 was not supported. The differences between symbolic transformation scores obtained by dyads of boys and dyads of girls did not reach the level of statistical significance $F(1,14) = .959$, $p = .344$, $\eta^2 = .064$. Therefore, Hypothesis 6 was not supported.

Table 4-18

ANOVA Source Table for 'Animation' by Peer Context, Gender, and Time

Source	SS	df	F	p-value	Partial Eta Squared
Context	.008	1	1.506	.240	.097
Error	.079	14			
Gender	.005	1	.959	.344	.064
Error	.069	14			
Context X Gender	.028	1	5.036	.042	.265
Time	.018	1	2.354	.147	.144
Error	.107	14			
Time X Gender	.000	1	.001	.980	.000
Context X Time	.004	1	.655	.432	.045
Error	.094	14			
Context X Time X Gender	.012	1	1.844	.196	.116

Table 4-19 presents a summary of the effects of peer context, gender, and time on *attribution of function* (#2 category of symbolic transformation). The three-way interaction was judged nonsignificant and there were no significant two-way interactions. However, as seen in Table 4-19, there was a statistically significant main effect for context $F(1,14) = 8.890$, $p = .010$, $\eta^2 = .388$. Further analysis examining this effect showed that children performed better in the *low-low* context compared to the *low-high* context. As reported in Table 4-19, the scores of symbolic transformations obtained by dyads of boys and dyads of girls were not significantly different, $F(1,14) = 2.710$, $p = .122$, $\eta^2 = .162$. Hypothesis 6 was not supported. Differences in symbolic transformation scores obtained by children in the initial play episodes and subsequent play episodes were

not statistically significant, $F(1,14) = .155$, $p = .700$, $\eta^2 = .011$. Therefore, Hypothesis 5 was not supported.

Table 4-19

ANOVA Source Table for 'Attribution of Function' by Peer Context, Gender, and Time

Source	SS	df	F	p-value	Partial Eta Squared
Context	.171	1	8.890	.010	.388
Error	.269	14			
Gender	.148	1	2.710	.122	.162
Error	.764	14			
Context X Gender	.001	1	.066	.800	.005
Time	.006	1	.155	.700	.011
Error	.523	14			
Time X Gender	.029	1	.764	.397	.052
Context X Time	.023	1	2.138	.166	.132
Error	.151	14			
Context X Time X Gender	.017	1	1.609	.225	.103

Table 4-20 provides a summary of the effects of peer context, gender, and time on *substitution* (#3 category of symbolic transformations). The three-way interaction was judged nonsignificant. As reported in Table 4-20, there were no significant two-way interactions. The analyses showed that the main effect for context was not statistically significant, $F(1,14) = .029$, $p = .866$, $\eta^2 = .002$. Hypothesis 1 was not supported. There were also no statistically significant symbolic transformations by gender $F(1,14) = .732$, $p = .407$, $\eta^2 = .050$. Hypothesis 6 was not supported. Symbolic transformation scores obtained by children in the initial play episodes and subsequent play episodes were not significant, $F(1,14) = .423$, $p = .526$, $\eta^2 = .029$. Hypothesis 5 was not supported.

Table 4-20

ANOVA Source Table for 'Substitution' by Peer Context, Gender, and Time

Source	SS	df	F	p-value	Partial Eta Squared
Context	.000	1	.029	.866	.002
Error	.010	14			
Gender	.001	1	.732	.407	.050
Error	.011	14			
Context X Gender	.000	1	.000	.990	.000
Time	.000	1	.423	.526	.029
Error	.009	14			
Time X Gender	.000	1	.708	.414	.048
Context X Time	.000	1	.361	.557	.025
Error	.015	14			
Context X Time X Gender	.001	1	.676	.425	.046

Table 4-21 provides a summary of the effects of peer context, gender, and time on *insubstantial material attribution* (#4 category of symbolic transformations). The three-way interaction was judged nonsignificant. There were no significant two-way interactions. However, the analyses showed that the main effect for gender was statistically significant, $F(1,14) = 6.956$, $p = .020$, $\eta^2 = .332$. Further analysis examining this main effect showed that girls outperformed boys in both contexts (*low-low* and *low-high*). Hypothesis 6 was supported. As reported in Table 4-21, the scores of symbolic transformations obtained in the *low-low* versus the *low-high* context were not significantly different, $F(1,14) = .511$, $p = .486$, $\eta^2 = .035$. Thus, Hypothesis 1 was not supported. Symbolic transformation scores obtained by children in the initial play episodes and subsequent play episodes were not significant, $F(1,14) = .087$, $p = .773$, $\eta^2 = .006$. Hypothesis 5 was not supported.

Table 4-21

ANOVA Source Table for 'Insubstantial Material Attribution' by Peer Context, Gender, and Time

Source	SS	df	F	p-value	Partial Eta Squared
Context	.002	1	.511	.486	.035
Error	.052	14			
Gender	.016	1	6.956	.020	.332
Error	.033	14			
Context X Gender	.002	1	.660	.430	.045
Time	.000	1	.087	.773	.006
Error	.071	14			
Time X Gender	.001	1	.183	.675	.013
Context X Time	.007	1	2.412	.143	.147
Error	.042	14			
Context X Time X Gender	.006	1	2.086	.171	.130

Table 4-22 provides a summary of the effects of peer context, gender, and time on *insubstantial situation attribution* (#5 category of symbolic transformations). The three-way interaction was judged nonsignificant. There were no significant two-way interactions. However, the analyses showed that the main effect for gender was statistically significant, $F(1,14) = 10.583$, $p = .006$, $\eta^2 = .430$. Further analysis showed that girls outperformed boys in both contexts (*low-low* and *low-high*). Therefore, Hypothesis 6 was supported. The scores of symbolic transformations obtained in the *low-low* versus the *low-high* context were not significantly different, $F(1,14) = .041$, $p = .843$, $\eta^2 = .003$. Thus, Hypothesis 1 was not supported. Symbolic transformation scores obtained by children in the initial play episodes and subsequent play episodes were not significant, $F(1,14) = .274$, $p = .609$, $\eta^2 = .019$. Hypothesis 5 was not supported.

Table 4-22

ANOVA Source Table for 'Insubstantial Situation Attribution' by Peer Context, Gender, and Time

Source	SS	df	F	p-value	Partial Eta Squared
Context	.001	1	.041	.843	.003
Error	.376	14			
Gender	.256	1	10.583	.006	.430
Error	.339	14			
Context X Gender	.003	1	.095	.762	.007
Time	.005	1	.274	.609	.019
Error	.234	14			
Time X Gender	.000	1	.000	.999	.000
Context X Time	.001	1	.081	.781	.006
Error	.209	14			
Context X Time X Gender	.014	1	.917	.355	.061

Table 4-23 provides a summary of the effects of peer context, gender, and time on *role attribution* (#6 category of symbolic transformations). The three-way interaction was judged nonsignificant. There were no significant two-way interactions. However, the analyses showed that the main effect for context was statistically significant, $F(1,14) = 8.398, p = .012, \eta^2 = .375$. Further analysis examining this main effect showed that children performed better in the *low-high* context compared to the *low-low* context. Thus, Hypothesis 1 was supported. As reported in Table 4-23, the scores of symbolic transformations obtained by dyads of boys and dyads of girls were not significantly different, $F(1,14) = 3.537, p = .081, \eta^2 = .202$. Hypothesis 6 was not supported. Symbolic transformation scores obtained by children in the initial play episodes and subsequent play episodes were not significant, $F(1,14) = .018, p = .895, \eta^2 = .001$. Hypothesis 5 was not supported.

Table 4-23

ANOVA Source Table for 'Role Attribution' by Peer Context, Gender, and Time

Source	SS	df	F	p-value	Partial Eta Squared
Context	.063	1	8.398	.012	.375
Error	.106	14			
Gender	.065	1	3.537	.081	.202
Error	.257	14			
Context X Gender	.014	1	1.901	.190	.120
Time	.000	1	.018	.895	.001
Error	.221	14			
Time X Gender	.021	1	1.352	.264	.088
Context X Time	.013	1	1.319	.270	.086
Error	.137	14			
Context X Time X Gender	.014	1	1.461	.247	.095

Social Competence

Descriptive Statistics. Descriptive statistics including means and standard deviations for social competence by gender were calculated. These descriptive statistics are reported in Table 4-24. Before conducting the analysis for social competence, the descriptive statistics (Table 4-24) were examined to determine if the variances were homogenous. Based on an examination of stem-and-leaf plots, and normal probability plots, it was judged that the scores approximated a normal distribution.

Results by Hypothesis. There was one research hypothesis with regard to the correlation between symbolic transformations and social competence. For ease of reader interpretation, the hypothesis is listed followed by a summary of the statistical analysis to test this hypothesis.

Hypothesis 4. There will be a statistically significant correlation between children's symbolic transformation scores and their social competence scores. In order to test this hypothesis, the Pearson Product Moment correlation coefficient was computed for children's symbolic transformation scores and their social competence scores.

The results, as shown in Table 4-25, indicated that the correlation between children's symbolic transformations and their social competence did not reach a statistically significant level. Thus, Hypothesis 4 was not supported.

Table 4-24

Means and Standard Deviations for Social Skill Measures by Gender

	Gender	n	M	SD
Social Skill Total	Female	26	2.08	.272
	Male	21	2.14	.478
	Total	47	2.11	.375
Problem Behavior Total	Female	26	1.96	.528
	Male	21	1.95	.384
	Total	47	1.96	.464
Social Skill Percentage	Female	26	55.58	23.022
	Male	21	62.71	20.470
	Total	47	58.77	21.979
Problem Behavior Percentage	Female	26	51.35	23.818
	Male	21	49.05	21.313
	Total	47	50.32	22.520

Summary

The results of the statistical analyses relating to each of the research hypothesis were presented in this chapter. The first section focused on the analyses conducted to determine if there were any significant differences in the symbolic transformation scores of children across the different preschool settings. The finding suggests that differences in the scores of children across different preschool settings were not statistically significant except for the measure for *attribution of function*. It was judged that this difference would not have a significant effect on the findings of the current study.

The results of this study showed that there were statistically significant differences in the means of the symbolic transformations of dyads with similar theory of mind ability and dyads with different theory of mind ability in terms of *attribution of function and role attribution* (arguably the most complex category of symbolic transformation). This study also found a statistically significant correlation between theory of mind and *role attribution*. There was no evidence of a statistically significant relationship between theory of mind and social competence. There was also no

Table 4-25

Intercorrelations Between Social Competence and Symbolic Transformations Measures

	1	2	3	4	5	6	7	8	9	10
1. Social Skill Total	-	-.010 (.961)	.564** (.003)	-.022 (.919)	-.028 (.895)	-.006 (.976)	-.051 (.807)	.183 (.380)	.030 (.885)	.054 (.799)
2. Problem Behavior Total		-	-.193 (.355)	.780** (.000)	-.091 (.667)	-.186 (.372)	-.125 (.550)	.075 (.722)	.028 (.893)	.244 (.240)
3. Social Skill Percentage			-	-.302 (.143)	.264 (.202)	.027 (.899)	-.215 (.302)	.169 (.419)	-.142 (.500)	.095 (.650)
4. Problem Behavior Percentage				-	-.221 (.288)	-.228 (.272)	-.100 (.635)	-.055 (.793)	.148 (.480)	.257 (.214)
5. Animation					-	-.119 (.573)	-.193 (.356)	-.229 (.270)	.256 (.218)	-.261 (.208)
6. Attribution of Function						-	-.155 (.459)	-.156 (.458)	-.548** (.005)	-.265 (.200)
7. Substitution							-	.125 (.551)	-.131 (.533)	-.270 (.191)
8. Insubstantial Material Attribution								-	.017 (.937)	.033 (.876)
9. Insubstantial Situation Attribution									-	.073 (.728)
10. Role Attribution										-

Note: ** Correlation is significant at the 0.01 level.

evidence of a statistically significant relationship between children's symbolic transformations and their social competence. This study also failed to find a statistically significant difference in the means of the symbolic transformation score obtained by children in the initial play episodes and subsequent play episodes.

The prediction that there would be a statistically significant difference in the means of the symbolic transformation scores obtained by dyads of boys and dyads of girls was supported by the data for two out of the six categories of symbolic transformations (category #4: *insubstantial material attribution* and category #5: *insubstantial situation attribution*).

CHAPTER V

DISCUSSION AND RECOMMENDATIONS

The first part of this final chapter consists of a summary of the study presented in this dissertation. Conclusions derived from the results of the study are presented. Then, the results and conclusions are discussed with reference to the theoretical framework and empirical evidence provided in the first two chapters. The final part of this chapter also discusses implications of the study for practice, and suggestions for future research.

Summary

The purpose of this study was to explore the relationship between children's theory of mind, symbolic transformations in pretend play, and social competence. The relationship between theory of mind and pretend play was discussed in the review of literature. In addition, the relationship between pretend play and children's social competence was discussed. The review of literature also included an examination of the link between theory of mind and children's social competence.

The literature review provided evidence that mental representations/states utilized in pretend play such as 'belief,' 'desire,' and 'pretend' are closely linked to theory of mind. Several studies support the idea that there is a relationship between pretend play and children's theory of mind (e.g., Lalonde & Chandler, 1995; Lillard, 2001a, 2001b). A study by Schwebel et al. (1999) provided partial confirmation for the view that children who have more engagement in make-believe play are inclined to have more sophisticated capability to integrate contradictory representations. Youngblade and Dunn (1995) examined the relationship between pretend play, and a component of theory of mind such as false belief. The results revealed that children who had more engagement in pretend play when they were 33-months old did better on false belief tasks when they were 40 months. They also found a

significant relationship between children's understanding of other people's beliefs/feelings and early social pretense. Recent research findings highlight the association between theory of mind and social behavior/understanding, including social competence (e.g., Astington & Jenkins, 1995; Capage & Watson, 2001; Charman & Campbell, 2002; Lalonde & Chandler, 1995; Taylor & Carlson, 1997; Watson et al., 1999). Capage and Watson (2001) investigated the association between social-cognitive skills, aggression, and social competence. The findings supported the hypothesis that comprehension of the core concepts of a theory of mind and competent social behavior are related. The findings of this study support the significance of the development of a theory of mind in children's social cognition. Recent research suggests a link between theory of mind and social skills (e.g., Astington & Jenkins, 1995; Lalonde & Chandler, 1995). For instance, Watson et al. (1999) state that "a more well-developed theory of mind seems likely to promote adaptive social functioning" (p. 390).

In general, the literature suggests that theory of mind and pretend play are connected. Moreover, many researchers have highlighted the link between theory of mind and social competence. It seems that a more developed theory of mind ability may result in more advanced pretend play or more engagement in pretend play, as well as more social understanding.

In this study, drawing on a Vygotskian theory, it was hypothesized that children who play with a more skilled peer would represent more complex forms of symbolic transformations, compared to children who play with a less skilled peer. As discussed earlier in the first chapter, according to Vygotsky (1978), there are two developmental levels: the *actual developmental level* and *level of potential development*. The actual developmental level refers to "functions that have already matured, that is, the end products of development" (p. 86). Namely, it refers to what a child can do without help. A level of potential development can be defined as what a child can do by receiving help from more experienced others. Vygotsky calls the difference between these two levels "the zone of proximal development" (ZPD). Vygotsky (1978) defines the ZPD as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). Therefore, it seemed plausible, based on Vygotsky's (1978) notion of the ZPD, that there could be differences in a child's symbolic

transformations in pretend play when he or she interacts with a peer with high theory of mind score compared to interacting with a peer with low theory of mind score. In other words, it was predicted that a child with low theory of mind score would perform more complex forms of symbolic transformations when playing with a child with high theory of mind ability, in comparison to playing with a child with low theory of mind ability.

An important design implication here was to examine the comparison of children's symbolic transformations in pretend play (playing with peers with similar versus different theory of mind ability) by utilizing Vygotsky's notion of the ZPD. Consequently, this study was designed to make inferences about the role of peer context on children's symbolic transformations in pretend play, as well as the relationship between theory of mind and pretend play.

This study was conducted with 47 four-year-old children. Initially, four theory of mind tasks: (1) change in location, (2) appearance-reality, (3) unexpected contents, and (4) misleading picture were administered to each child. Based on the total theory of mind scores, children were categorized as *low* and *high*. After obtaining the theory of mind scores from all participants, the children were grouped into same-gender dyads. There were two kinds of dyads: a dyad of children who scored *low* (X_{1Low} X_{2Low}) and a dyad of the same child who scored *low* (X_{1Low}) and a child who scored *high* (Y_{1High}). In the play sessions, children's performances in the *low-low* dyads versus the *low-high* dyads were videotaped. These recordings were examined and coded with respect to symbolic transformations. The utterances of children during pretend play were coded according to Matthews' (1977) object transformation and ideational transformation categories. Children's social skills were measured by administering the *Social Skill Rating Scale* (Gresham & Elliot, 1990). For this purpose, the teachers completed the questionnaire at the beginning and at the end of the data collection.

The pretend play sessions were conducted in three preschools. The results showed that the differences resulting from the settings reached the level of statistical significance in only one case; *attribution of function*. That is, according to the data, there were no significant differences in children's use of symbolic transformations across the three settings, other than the category of *attribution of function*. Given that there were no other significant group

differences for this measure, it is reasonable to assume that the fact that the data were collected in three different sites, did not significantly influence the outcomes of the study.

A number of hypotheses were tested. The hypotheses dealing with group differences (Hypothesis 1, 5, and 6) were tested by using an *F* test derived from a repeated measures analysis of variance (ANOVA). The hypotheses regarding correlation (Hypotheses 2, 3, and 4) were tested by computing the Pearson Product Moment correlation coefficient and testing the significance of the coefficient.

The primary purpose of this study was to examine the relationship between theory of mind and pretend play. The second aim was to investigate the relationship between theory of mind and social competence. Analyses were conducted to determine whether children's theory of mind and their symbolic transformations in pretend play were significantly correlated. Several analyses were conducted to determine if there were any differences between male and female children's symbolic transformation scores. The data were also analyzed to determine if there were any differences in symbolic transformation scores obtained by children in the initial play episodes and subsequent play episodes. An examination of whether children's theory of mind and their social competence were significantly correlated was also made. Another aim of this study was to explore if there was a significant correlation between children's symbolic transformations in pretend play and their social competence. In addition, the study was designed to make inferences about the effects of peer context on children's symbolic transformations in pretend play.

Carrying out this study's purposes depended upon a precise assessment of theory of mind ability. Therefore, four theory of mind tasks were utilized. This approach differs significantly from the approach that has been used in many other studies (e.g., Chin & Bernard-Opitz, 2000). After assessing children's theory of mind ability, analyses were conducted to determine if there were any gender differences on theory of mind. No statistically significant gender differences were found on theory of mind ability.

The primary focus of the study was to examine the relationship between theory of mind and symbolic transformations in pretend play. In the study, symbolic transformations were defined using Matthews' (1977) categories as follows:

Object modes of transformation subcategories

The child's verbal ascription of a make-believe property or identity to a real referent is the main component of the object modes of transformation. These modes are categorized as object modes of transformations because of the child's manipulation of real material that exists in the present play area. The following are the subcategories of the object modes of transformation.

1. *Animation*: Ascribing living features to a non-living object. For example, a child says about a doll "my baby is hungry."
2. *Attribution of function*: Ascribing a functional feature to an object with no possession of that feature. For instance, a child with a toy video-camera says to his or her parents "I am videotaping you, okay?" In this example, the child ascribes a feature of a real video camera to the toy video camera.
3. *Substitution*: Giving a new identity to an existing object. A child says about a thick block "here is my truck" (Matthews, 1977; McLoyd, 1980)

Ideational transformation subcategories

Unlike the object modes, ideational transformations require ideas or mental images of objects that are not present at least in the present play area. An abstraction, idea, or theme, which is comparatively independent of any existing material, is entailed in ideational modes. The following are subcategories of ideational transformation:

4. *Insubstantial material attribution*: It requires make-believe that an unreal/imaginary object exists. It involves reference to material that either does not exist or does not exist in the present play area.
5. *Insubstantial situation attribution*: It takes place when someone pretends that an imaginary situation exists. For example, a child says, "we have arrived the airport" after pretending to be in a taxi by sitting on a table.
6. *Character/Role attribution*: Depiction of a make-believe role or character (e.g., a policeman, a nurse, a mother, a super hero etc.). For example, a child says to his or her friend "I will be the teacher while you will be the student" (Matthews, 1977; McLoyd, 1980).

Symbolic Transformations in Pretend Play and Social Competence

One goal of this study was to examine the relationship between symbolic transformations in pretend play and social competence. Surprisingly, however, no such relationship was found. Possibly, the sample size was too small to detect any potential relationship. Similarly, the instrument used in the study, with its reliance on teacher judgments, may not have adequately measured social competence. On the other hand, it is equally possible that the ability to use symbolic transformations is not related to a child's social competence. Clearly, further research is necessary to explore this issue.

Gender Differences and Familiarity with Play Partner in Pretend Play

In this study, girls performed better than boys in two of the subcategories of ideational transformations: *insubstantial material attribution* and *insubstantial situation attribution*. When children engage in ideational transformations, they are less dependent of real objects or materials for their pretense (Carrick, 1999; McLoyd, 1980). Therefore, it seems that, girls in this study were more creative than boys in terms of producing pretend scenes, regardless of the materials that were made available to them. In other words, during pretend play, girls attributed more imaginary materials (i.e., materials that were not available to them in the classroom setting) and pretended that imaginary situations exist. This is clearly illustrated in the following examples: A child says: “*Let me get my bag*” and she puts an imaginary bag into her arm (no such bag exists in the classroom, *insubstantial material attribution*). Another example is given by one of the girls: “*I am in the post office*” (*insubstantial situation attribution*).

In addition to this finding, in the *animation* category, one of the subcategories of object transformations, boys outperformed girls in the *low-high* context. One plausible explanation for this finding is that play context (playing with more skilled peer) improved boys' performance; however, it did not result in producing ideational transformation because boys were more dependent on the objects that exist and made available in the play area.

This study failed to find a statistically significant difference in the means of the symbolic transformation score obtained by children in the initial play episodes and

subsequent play episodes. It seems that familiarity with a play partner (playing with a peer second time) did not improve children's performance in pretend play in terms of symbolic transformations.

Theory of Mind and Social Competence

The results indicated that there was no relationship between children's theory of mind and social competence. This is surprising because previous research has demonstrated significant associations between theory of mind and social competence/skills (e.g., Astington & Jenkins, 1995; Watson et al., 1999). It is possible that social skills and theory of mind are associated even though this study failed to find such association. For example, Lalonde and Chandler (1995) used a questionnaire that they developed to assess children's social skills. Watson et al. (1999) utilized teacher ratings that consisted of a Likert scale to assess children's social skills. One plausible explanation is that instruments used in these studies (i.e., Lalonde & Chandler, 1995; Watson et al., 1999) to assess social skills might be more precise compared to the instrument used in this study (*Social Skills Rating Scale*, Gresham & Elliot, 1990). The *Social Skills Rating Scale* (SSRS) asks teachers to rate children's social skills in terms of cooperation, assertion, responsibility, empathy, and self-control. The questionnaire asks teachers to indicate the frequency of exhibition of certain social skills or problem behaviors for each child (Gresham & Elliot, 1990).

It is also possible that social skills and theory of mind are not associated as found in this study. One plausible explanation for this is provided by Symons (2004):

An understanding of the mental states of others provides a foundation for interpreting behavior and interacting with others, so social understanding should therefore have a basis in mental state reasoning. One of the difficulties with research in this area is that awareness of psychological states does not necessarily lead to prosocial behavior. An advanced theory of mind could lead to either empathy and caring for others, or exploitation of others. (p. 178)

Referring to the study by Sutton (2003), Symons (2004) states that 'bullying' is not about being unable to understand others' thoughts and feelings, but actually is about being aware of the thoughts and feelings of others but not caring. It is very likely that while having

an advanced theory of mind could improve social empathy, it could also have a negative effect (or no effect) on social skills. This is because knowing more about others' minds may lead to exploitation of others, or to ignore feelings and thoughts of others.

Peer Context

It was predicted that there would be a statistically significant difference in the means of the symbolic transformations of dyads with similar theory of mind ability, and dyads with different theory of mind ability. Regarding the differences in the symbolic transformations, the data suggest that peer context has a significant effect on children's ability to engage in ideational transformations. This was particularly true for children's *role attribution*, arguably the most complex category of symbolic transformation.

One explanation for this finding is that playing with more skilled peer increases the capacity of the child who is less skilled. It is as if the more skilled child pushes the less skilled child into an area of potential development. In this study, children who had scored low on theory of mind tasks were able to engage in more advanced ideational transformations when they interacted with a child who was more advanced in terms of theory of mind. The results lend support to the proposition that peer context (playing with a peer with high theory of mind ability) promotes children's ability to perform more complex forms of symbolic transformations. For example, when a child with low theory of mind ability was paired with a child with low theory of mind ability, he or she represented less complex forms of symbolic transformations such as *attribution of function*. However, when the same child with low theory of mind ability played with a peer with high theory of mind ability, he or she performed more complex forms of symbolic transformations such as *role attribution*. Compare the following examples of the same child's symbolic transformations in the two different peer contexts:

Example 1, Child A in a *low-low* context: (The child appears to be playing alone) The child picks up the scanner of a toy cash register and scans an apple. Then, he says: "*I scanned an apple.*"

Example 2, Child A in a *low-high* context: The child puts a mask on his face. Then, he looks at his play partner and says: "*I am a super hero*" and tries to fly.

In the first example, the child with low theory of mind ability was paired with another child with low theory of mind ability. In the 10 minute pretend play session, the most complex symbolic transformation he made was *attribution of function*, one of the object transformation subcategories (category #2). When the same child was paired with a child with high theory of mind ability (example 2), he pretends to be a super hero. Then, he tries to act like a super hero. This symbolic transformation is categorized as *role attribution*, one of the subcategories of ideational transformations, arguably the most complex form of symbolic transformation (category #6). It is clear from the above examples that peer context can have a substantial effect on children's symbolic transformations.

It should be noted, however, that in the *attribution of function* category, children performed better in the *low-low* context compared to *low-high* context. *Attribution of function* is one of the subcategories of object transformations. In object transformations, children depend on the real materials that exist in the present play area. Namely, symbolic transformations with regard to object transformations involve materials that exist in the play area, as opposed to materials that do not exist in the play area. This is, because object transformations (i.e., *attribution of function*) necessitate a reliance on objects in the play area, and as such they are much less complex compared to ideational transformations (i.e., *role attribution*), which do not depend on objects available in the play area. One plausible explanation for children's better performance in the *low-low* context compared to the *low-high* with regard to *attribution of function* is that having a play partner with high theory of mind would more likely result in performing more complex forms of symbolic transformations such as *role attribution*. Namely, because in the *low-low* context both children have low theory of mind scores, it is more likely for them to perform less complex forms of symbolic transformations such as *attribution of function*.

Taken as a whole, therefore, the study's findings suggest that children with low theory of mind will engage in play activities that involve object transformations. Neither play partner on his or her own has the ability to extend the play episode to a more advanced level, or a level that involves ideational transformation such as role play. Instead, they have to rely on the materials that are available in the play area, and consequently they engage in object transformations. However, when one of the partners has a well-developed theory of mind, he or she is able to engage in ideational transformations (i.e., role play). This combination of a

more skilled peer and a role play scenario enables the less skilled peer to engage in ideational transformations, or play performance that is at the upper reaches of the child's zone of proximal development.

Theory of Mind and Symbolic Transformations in Pretend Play

The results indicated that the level of theory of mind and *role attribution* in pretend play are correlated. However, determining the causality of this relationship is beyond the scope of this study. The correlation between theory of mind and *role attribution* found in this study is consistent with the findings of Astington and Jenkins (1995).

As previously discussed in the literature review, obtaining others' point of view is related to theory of mind and pretense is dependent on mental representations (Lillard, 1993), therefore, it is related to theory of mind. In this study, it was found that children with low theory of mind scores represented *role attribution* when playing with children with high theory of mind scores. We know from the literature review that when a child is engaged in *role attribution*, that is role play, he or she puts himself or herself into someone else's position and utilizes mental representations. Namely, utilizing *role attribution* would necessitate a well-developed theory of mind ability. However, examining the result of this study raises the following question: How is it possible for a child with low theory of mind score to represent, arguably, the most complex form of symbolic transformation? Contrary to the prediction that theory of mind promotes pretend play, it appears, from the results of this study, that along with peer context, role play, rather than pretend play in general, contributes to the development of a theory of mind. When a child with low theory of mind score is paired with another child with low theory of mind score, use of *role attribution* is not very likely. However, when the same child is paired with a child with high theory of mind score, he or she is able to utilize *role attribution*, which theoretically requires a well-developed theory of mind ability.

To understand why specifically role play, and not pretend play in general, promotes children's theory of mind, the two types of dyads should be examined closely. The differences in the two situations (*low-low* versus *low-high*) are peer context and use of role play. In the *low-low* situation children were engaged in pretend play but not specifically in

role play. However, in the *low-high* situation the differences are to play with a more skilled peer and to engage in role play. Therefore, it seems that peer context (playing with a more skilled peer) and engaging in role play, rather than pretend play in general, promote the development of a theory of mind. The significant correlation found in this study between theory of mind and *role attribution* did not provide certainty about the direction of this relationship. However, interpreting this correlation along with the significant difference (regarding *role attribution*) in the means of the symbolic transformations of dyads with similar theory of mind ability, and dyads with different theory of mind ability suggests that role play, rather than pretend play in general, is the promoter of the development of a theory of mind.

This conclusion supports Harris' (2000) view as mentioned in Azar's (2002) article. According to Harris (2000), not all types of pretend play, but rather a specific type of pretending, (i.e., role play) promotes the understanding of others' mental states. In short, development of a theory of mind is promoted by a specific type of pretending: role-play. In role play, "children identify and then produce actions and remarks that fit the role of identity of that character" (Harris, 2000, p. 34). Harris considers role play, rather than pretend play in general, as enabling children to simulate others' mental states. Namely, engaging in role play provides a suitable context in which theory of mind ability could develop. Simulation theory may provide an explanation on how role play promotes theory of mind. Simulation theorists claim the existence of a close link between role play, a form of pretend play, and theory of mind. When children engage in role play, they temporarily put reality aside, and see the world through the perspective of the other person (Harris, 2000). According to simulation theory, children assume others' mental states via role taking, namely simulation (Flavell, 1999).

The study's findings extend our current understanding of the relationship between theory of mind and symbolic transformations in pretend play. It is concluded that theory of mind and role play are correlated. The findings of this study indicate that role play is critical for the development of a theory of mind. This is because role play allows children to simulate others' mental states (Harris, 2000). Thus, in this study, it was concluded that role play is a prelude for the development of a theory of mind. The results of this study support the assumption that there would be a statistically significant difference in the means of the

symbolic transformations of dyads with similar theory of mind ability (*low-low*) and dyads with different theory of mind ability (*low-high*). It is, therefore, concluded that peer context has a significant effect on children's symbolic transformations in pretend play. Children performed better, especially regarding role play, when they were paired with more skilled peers. Namely, when these children were paired with more skilled peers, they performed at a higher level in terms of symbolic transformations.

Implications for Practice

The findings of this study present several implications for educational practice. First, this study informs early childhood educators that peer context in pretend play can lead to children using more advanced symbolic transformations. The data suggest that, playing with a more skilled peer leads to more complex forms of symbolic transformations during pretend play. We know from the literature that symbolic ability in young children has an effect on their future development across several domains. We also know that in some preschools, classroom activities are arranged as individual activities. In light of this information, early childhood education policy makers, teachers, and administrators should consider providing many types of activities in which children could play with more skilled peers, so that these less capable children would benefit from interacting with their peers. The important point here would be to arrange groups of children (more skilled and less skilled) and provide them with opportunities to engage in role play. Such arrangements can also involve children from a variety of ages (i.e., 4 and 5 years old). Providing opportunities for children to develop their theory of mind through role play would potentially lead to several benefits as outlined earlier in the review of literature.

It is worth noting here that such arrangements should be made in a moderate way. Vygotsky (1978), in discussing the zone of proximal development, emphasized the importance of the assistance of an adult or a more skilled peer. Vygotsky appears to pay particular attention to peer influences in the process of child development. Current researchers understand and recognize the significant influence of peers and peer context on children's development. According to Crain (2000), researchers who have studied Vygotskian theory point out the possible negative effects of having children work with more

skilled peers. Whereas, Vygotsky emphasized that the “help of others” could lead children to solve problems beyond their level, he ignored the fact that obtaining help from others can have some negative effects such as weakening the child’s independence (Crain, 2000).

This study provides empirical evidence for early childhood education researchers, policy makers, teachers, and administrators that learning is not only about inner development, but also about socio-cultural development. Namely, learning can take place on an individual level and social level by working/playing with more skilled peer. At this point, the physical arrangement of the classroom plays a vital role. Classrooms should be arranged to promote interaction process so as to influence children’s performance on symbolic transformations. Also, it might be beneficial to include mixed-age group activities in the classroom’s schedule.

Another implication for early childhood education researchers, policy makers, teachers, and administrators is that activities and materials should be provided that encourage role play. Engaging in role play would teach children that people have different ideas and roles. This awareness should help children to feel more comfortable about having different ideas than others. Thus, developing such awareness during the early childhood years is crucial for children as it may help them to form a unique character, free from the worry that his or her opinions are different. Consequently, children may feel (and will not be worrying) that their ideas are different from the mainstream. To be precise, a child may become more tolerant toward himself or herself about his or her uniqueness, that is to say, tolerance on an individual level.

Recommendations for Future Research

This study examined the relationship between children’s theory of mind, symbolic transformations in pretend play, and social competence. The findings contribute to our understanding of peer context on children’s symbolic transformations in pretend play. According to the findings, there were no gender differences, in terms of children’s ability to complete the theory of mind tasks. One recommendation for future research, therefore, is to conduct a study with a larger sample to determine if there are gender differences in the development of a theory of mind. In the literature that focuses on theory of mind, there is a

gap in terms of our understanding of gender differences in the development of a theory of mind. Future research should therefore examine the development of a theory of mind in girls and boys with a sample that consists of different age groups to determine the effects of age and gender on the development of a theory of mind.

In this study, children's theory of mind ability was assessed before they engaged in pretend play. It would be interesting to assess children's theory of mind ability before and after pretend play sessions. This would enable researchers to more accurately assess the effect of role play on the development of a theory of mind ability. Future research that includes testing theory of mind ability before and after pretend play sessions would also provide more information on how peer context influences children's theory of mind ability.

A possible direction for future research is to conduct this study with a larger sample of subjects. A larger sample would lead to increased precision in measuring the relationship between theory of mind and social development. It would also be interesting to examine the relationship between theory of mind and social competence longitudinally. In the current study, four-year old children's theory of mind ability and their social competency were examined. From the literature review, it seems that four-year-olds are at the optimum age for detecting theory of mind. To determine the distal effects of theory of mind, future research should measure theory of mind and social competence of four year old children and then measure their social competency when they enter kindergarten.

In the current study, it was found that peer context affects children's symbolic transformations in pretend play. In this study, peer context referred to play with a peer with similar theory of mind ability versus a peer with different theory of mind ability. Future research should address the extent to which the effect of peer context varies. For example, studies could compare the performance of friends versus non-friends dyads on children's pretend play. Future research could also expand this 'peer context' to include different dyads of both kinds (the same versus different gender dyads) to determine whether these different dyads perform differently in pretend play sessions in terms of symbolic transformations. Such descriptive data should extend our understanding of the ways peer context relate to pretend play.

One of the areas that has not been widely examined in the research of theory of mind is the effects of demographic factors on the development of a theory of mind. Future research

that considers demographic variables (i.e., parents' demographics, number of siblings, age difference between siblings, parents' education level) would have a better understanding on the development of a theory of mind, pretend play, and social competence.

In the current study, a significant relationship was found between theory of mind and role play. In examining this relationship, more studies are necessary to determine exactly what children achieve by engaging in role play. How do children who engage in less role play develop theory of mind? Do children who engage in less role play develop theory of mind later compared to children who engage in more role play? A potential direction for future researchers is the design of studies that to address these and other perplexing questions.

Conclusion

This study was an attempt to understand the link between theory of mind, symbolic transformations in pretend play and children's social competence. This study presents evidence that playing with a more skilled play partner (regarding theory of mind ability) improves children's symbolic transformations in pretend play. The results of this study suggest that along with peer context, role play, rather than pretend play in general, contributes to the development of a theory of mind. The significant correlation found in this study between theory of mind and *role attribution* did not provide certainty about the direction of this relationship. However, interpreting this correlation along with the significant difference (regarding *role attribution*) found in the means of the symbolic transformations of dyads with similar theory of mind ability and dyads with different theory of mind ability suggests that role play, rather than pretend play in general, is the promoter of theory of mind.

Contrary to what had been hypothesized, this study failed to find a significant correlation between theory of mind and children's social competence. Moreover, no relationship was found between symbolic transformations in pretend play and social competence. These results may be due to the small sample size. The results of this study revealed that familiarity with the play partner did not help children to represent more complex symbolic transformations in pretend play. In this study, girls performed better in two of the subcategories of ideational transformations while boys outperformed girls in one

of the subcategories of object transformations in the *low-high* context. Future research has an essential role to address these issues mentioned above.

In summary, this study represents an endeavor to elucidate the link between theory of mind, children's symbolic transformations in pretend play, and children's social competence. This study provides evidence regarding the importance of peer context on children's symbolic transformations in pretend play and suggestion that role play is the promoter of theory of mind in young children.

APPENDIX
HUMAN SUBJECTS COMMITTEE APPROVAL



Office of the Vice President For Research
 Human Subjects Committee
 Tallahassee, Florida 32306-2763
 (850) 644-8633 · FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 2/23/2005

To:
Burhanettin Keskin
 338-02 Pennell Cir
 Tallahassee FL 32310

Dept.: EDUCATION

From: ~~John Tomkowiak, Chair~~

John Tomkowiak, M.D.

Re: **Use of Human Subjects in Research**
The Relationship Between Theory of Mind, Symbolic Transformations in Pretend Play
and Children's Social Competence

The forms that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Human Subjects Committee at its meeting on **2/9/2005**. Your project was approved by the Committee.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals which may be required.

If the project has not been completed by **2/8/2006** you must request renewed approval for continuation of the project.

You are advised that any change in protocol in this project must be approved by resubmission of the project to the Committee for approval. Also, the principal investigator must promptly report, in writing, any unexpected problems causing risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols of such investigations as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Protection from Research Risks. The Assurance Number is IRB00000446.

cc: Ithel Jones
 HSC No. 2005.079

INFORMED CONSENT FORM

I, Burhanettin Keskin, am a graduate student in Early Childhood Education at Florida State University and am working towards my doctoral degree under the direction of Professor Ithel Jones, of Department of Childhood Education, Reading and Disability Services at Florida State University. I am conducting a research study to explore the relationship between children's theory of mind, symbolic transformations in pretend play, and social competence. I would appreciate your child's participation in this study because it will help us to make recommendations for improving the education of young children.

The specific procedures indicated below will be followed if you decide your child to participate in this study.

1. Your child will be given four theories of mind tasks. These tasks involve series of questions about imputing what other children think in certain situations. Completion of tasks would approximately take 15 minutes. This section of the study will not be videotaped.
2. Your child will be asked to engage in pretend play (four sessions, each one is 10 minutes, total 40 minutes) with another child. Your child and his or her playmate will be videotaped during pretend play sessions.
3. Teachers will be asked to administer a questionnaire to rate your child's social skills.
4. The procedures described above will involve no risks, discomfort or stresses to your child. They will be blended in as part of his or her activity. A potential benefit of participating in this study is that your child's pretend play skills should improve as he or she will engage in four sessions of pretend play.
5. It is expected that final sample will include 28 children.

Any information that is obtained in connection with this study and that can be identified with your child will remain confidential to the extent allowed by law unless you specifically give permission in writing to do otherwise. Confidentiality will be conserved by assigning each participant a code

number to be utilized instead of names. The name-to-number list will be kept in a confidential file available only to myself. All videotapes will be for the person who will recode the data and my own use only. The videotapes will be kept in a locked drawer in my office and will be destroyed in August 30, 2010.

Although we would like it very much if your child would participate, you are under no obligation to do so. Your child's participation in this study is voluntary. If you choose your child not to participate or to withdraw from the study at any time, there will be no penalty, it will not affect treatment/care of your child. If you decide your child not to participate, you are free to discontinue your child's participation at any time without prejudice. If your child withdraws from the study before data collection is completed, your child's data will be returned destroyed. The results of the research may be published, but your child's name will not be used. Personal information about your child will not be listed in the dissertation or any future publication(s). Upon request, I will be glad to share the results to you when the study is completed. However, I will not be able to provide data regarding your child or any other children who participate in this study.

If you have any questions concerning this research study, please contact my advisor, Dr. Ithel Jones, by phone (850-644-8468) or e-mail (ijones@coe.fsu.edu). You can also contact me by phone (850-575-8259) or e-mail (bbk9699@fsu.edu).

Please sign both copies of this form. Keep one and return the other to the school.

Your signature indicates that you received an explanation of the study, agree that your child can participate, and understand that your child's participation in this study is strictly voluntary.

I give consent for my child _____ to participate in the above study.

Parent's Name : _____

Parent's Signature: _____ (Date) _____



If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Committee, Institutional Review Board, through the Vice President for the Office of Research at (850) 644-8633.

Child Assent Form

I have been told it is ok for me to take part, if I want to, in this play activity.

I know that I can stop at any time I want to and it will be okay if I want to stop.

Name: _____



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BIOGRAPHICAL SKETCH

Burhanettin Keskin was born on October 12, 1976 in Erzurum, Turkey. He received his B.A. in Sociology from Ataturk University, Erzurum in 1997. While he was pursuing his Master's degree, he was awarded a full scholarship by the Turkish Ministry of Education to pursue a Master's and a Ph.D degree in the United States. He earned his M.A. in Early Childhood Education with a focus on special education from the University of Colorado at Denver in 2001. He began his Ph.D in Child and Family Studies at Syracuse University and continued his Ph.D in Early Childhood Education at Florida State University.

As a Ph.D candidate at Florida State University, he taught a course, Parents as Teachers, for several semesters. Besides teaching, he worked as a research assistant. He presented his academic work at professional conferences. He was awarded the Elizabeth Bell Smith Endowed Scholarship by the College of Education. His research interests include play in early childhood education, sociological and philosophical approaches to childhood, and theory of mind.