

Running Title: ToM, Temperament, and Prosocial Behavior

Theory of Mind, Temperament, and Prosocial Behavior in Preschoolers

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## ABSTRACT

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Theory of mind is the ability to understand that others have thoughts, beliefs, or ideas that differ from one's own. This study investigated the relationship between theory-of-mind and prosocial behavior in 42 preschoolers. Prosocial behavior is defined as voluntary actions intended to benefit another. The role of temperament was also examined in terms of the relationship between prosocial behavior and theory of mind. The researcher went to two preschools and administered a battery of seven theory-of-mind tasks individually to each child (Wellman & Lui, 2004). Parents completed a temperament questionnaire measuring emotionality, activity, sociability, and shyness. Teachers rated each child's prosocial behavior. It was hypothesized that prosocial behavior would positively correlate with theory-of-mind skills; this was not supported. It was also hypothesized that theory-of-mind and prosocial behavior would correlate positively with the temperament dimension of sociability, and would correlate negatively with the dimensions of shyness and emotionality. However, only emotionality correlated with theory of mind, with more emotional children having significantly lower theory-of-mind scores. More active children were rated as more prosocial, while those who were more shy were less prosocial. Results are discussed in terms of adapting children's environments to accommodate their temperaments and promote prosocial and theory-of-mind development.

## Theory of Mind, Temperament, and Prosocial Behavior in Preschoolers

Human interaction is at the heart of our relationships, a phenomenon in which we engage almost constantly, and on a daily basis. What allows for the kind of interpersonal awareness and understanding that is necessary for creating and maintaining bonds among two or more people is a very unique and complex form of perspective-taking. This perspective-taking ability is called a theory of mind, and it describes one's ability to recognize and understand that other people have thoughts, feelings, beliefs, and desires that may differ from one's own. We use this ability in incredibly subtle, oftentimes largely unconscious ways, to formulate our thoughts and judgments about others, and the reasons behind their words and actions. Without a theory of mind, we would be unable to engage in the crucial functions that allow human relationships to become so complex and profound; theory of mind abilities contribute to our capacity to empathize with others, to understand and respond to others' needs or wants, to impute and predict others' future actions and/or behavior, and to detect and take action to correct others' misunderstandings. Indeed, one could go so far as to say that theory of mind, and its related social and cognitive functions, are the means that give us the power to dictate the nature of all of our relationships, whether brief and transient, or deep and enduring.

Because of the importance of theory of mind to our skills in navigating the world of human interaction and relationship, it is important to study how and when this ability develops, and what sorts of factors promote and inhibit its healthy growth within individuals. Theory of mind development in fact begins at a very young age, as early as two-and-a-half years, and by the preschool ages of three and four years, and

the kindergarten age of five years, an incredible amount of crucial further development is taking place. The preschool classroom is an environment ripe with opportunities for social interaction, and the creation and maintenance of children's first concrete friendships. The peer relations that take place during these years in a child's life are critical for their future development, and so it is important to investigate thoroughly how theory of mind abilities affect and are affected by the intricate interaction of factors such as individual characteristics, experiences, and temperament. Through investigation of this nature, we can begin to understand how the significant social experiences of preschoolers are generated, and appreciate the complexity of the evolution of a theory of mind in humans. The current study was conducted in an effort to explore how children's development of theory of mind, their temperaments, and their prosocial behavior are related.

Premack and Woodruff (1978) first described theory of mind as the ability to attribute mental states to oneself and to others. The researchers wanted to explore the possibility that chimpanzees have a theory of mind that does not differ dramatically from that of humans. They elaborated on their concept of theory of mind as a "system of inferences" pertaining to states that are internal, and therefore not openly visible or observable, and from which one can begin to form predictions about the behavior of a certain organism (Premack & Woodruff, 1978). The most common inferences humans make about the mental states of others are purpose and/or intention.

However, there are many other states that humans attribute to others just as frequently, including belief - Susie *believes* in luck; doubt - John *doubts* that his team will win the game; pretending - They are only *pretending*; knowledge - She *knows* the

answer; thinking - Mark *thinks* he is correct; guessing - He is only *guessing*; and like - Janet *likes* chocolate (Premack & Woodruff, 1978). There are, of course, many significant states not mentioned in the above list, and inferences about mental states can become quite complex; it is not difficult to imagine how extensive the list would be if it accurately reflected the incredibly diverse spectrum of human mental states. Premack and Woodruff (1978) did find that theory of mind is present in apes, and concluded their study by stating that a theory of mind is also a universal function of human adults. However, the researchers also pointed out the importance of looking at another very important population: children. What, they asked, is the developmental pathway of theory of mind for a normally developing child?

The earliest studies conducted to test children's understanding of theory of mind used a variety of different methods, but it was Wimmer and Perner (1983) who created a more standard method for operationalizing and testing the theory. In seeking to determine at which age children develop a viable theory of mind, the researchers utilized a method involving a doll named "Maxi" who sees a chocolate bar being put into one of two cabinets. Maxi then leaves the room and is therefore absent at the critical moment when the chocolate bar is moved into the other cabinet. Those children who possess the ability to keep track of the location of the chocolate bar, and, simultaneously, understand that "Maxi," who was not in the room when the chocolate bar was moved, has no reason to believe that it is not still in the original cabinet, would need to have some measure of understanding of false belief, and therefore some theory of mind (Wimmer & Perner, 1983). The researchers found that

children under the age of four regularly failed this task, and were rarely able to acknowledge that Maxi would be misinformed in the situation.

While these and other findings seem to suggest that children younger than four years do not possess the cognitive abilities necessary for a system of beliefs about beliefs, criticisms have been made regarding certain attributes of Wimmer and Perner's (1983) "unexpected transfer" procedure described above. These critics suggest that the task fails to differentiate between the active ability to consider beliefs about beliefs and the completely separate and more complex ability to verbalize and explain this understanding, and that the "unexpected transfer" task is more convoluted and overly-computational than is practical or necessary (Chandler, Fritz, & Hala, 1989). Young children have difficulty grasping hypothetical situations, and this fact combined with the complicated story lines portrayed in the task could be a better explanation for the children's poor performance, rather than a lack of theory of mind. It is important to consider carefully the possibility that young children may entertain complicated thoughts about others' mental lives before they possess the ability to communicate these thoughts, especially in situations with hypothetical story characters and situations.

There have been studies conducted showing that even children as young as two-and-a-half display the ability to utilize effectively certain tactics with the goal of deceiving another person (Chandler, Fritz, & Hala, 1989). The tactics employed by the children require that they possess a consciousness that false beliefs can and do exist, and therefore they assume that some measure of theory of mind is already operative in children of this age. Research has also cited the fact that children as

young as two years old display the ability to differentiate between the real and the pretend (Leslie, 1988), and that children of this age frequently use mental state words/phrases and concepts (Wellman, 1988). These findings provide additional evidence for the presence of a very early development of theory of mind, and they show that even two- and three-year-olds hold some measure of theory-like comprehension of others' minds.

Chandler, Fritz, and Hala (1989) set out to design a procedure to test theory of mind in young children that did not depend on Wimmer and Perner's (1983) use of complicated narratives and the communication of who knows what about whom. The researchers sought to create an assessment that would focus more on whether subjects could actively *engage* in theory of mind-type thinking, rather than whether they could *tell* about theory of mind-type thinking. This revision manifested itself in an exploration of subjects' abilities to engage in deceptive behaviors. It is believed that if one deliberately alters or makes up information with the intention of deceiving another into believing something to be true which one knows to be false, then it is appropriate to say that one has theory of mind (Anderson, 1986). Chandler et. al.'s (1989) study was therefore designed to test whether two-, three-, and four-year-old children have the capacity to display deceitful behaviors that reflect their ability to actively comprehend the states of others and the ability of others to be misled and to possess false beliefs. The task they developed to test this was a "hide-and-seek" board game wherein the child was asked to hide a "treasure," or a small bag of gold coins/jewels from one of the researchers who left the room for a certain period of time. They were told to choose a hiding place for the treasure from a variety of

different colored containers, and to utilize the help of a puppet. The movement of the puppet on the playing board was tracked with his ink footprints on a white surface (Chandler, Fritz, & Hala, 1989). What the researchers found after conducting several trials utilizing the game to test subjects' abilities to think and act deceptively confirmed without a doubt that children as young as two-and-a-half years already make use of an array of deceptive tactics that assume a working false belief comprehension. In fact, only one of the 30 subjects younger than the three- to six-year-old group did not engage in any actions designed to mislead others. These types of actions consisted of getting rid of incriminating evidence (wiping away the puppet's footprints which led right to the container in which the treasure was hidden), or utilizing deceptive verbal and/or behavioral clues in order to conceal the true hiding place of the treasure. A remarkable number of two- and three-year-olds (90%) took steps to mislead purposefully others, and thus it is clear that children of this age possess the early stages of a theory of mind (Chandler, Fritz, & Hala, 1989).

Chandler, Fritz, & Hala decided to conduct another study in 1991 in order to replicate and validate their findings about young children and their theory of mind capabilities (Hala, Chandler, & Fritz, 1991). This study involved three studies with 70 three- and four-year-olds, and again sought to determine whether children below the age of four possess the ability to understand false belief, and therefore a theory of mind in the very early stages of development. The researchers again utilized the measure of deceptive hiding used in their previous study, and they again found that three-year-olds do already have a theory of mind developed enough to enable them to understand that other people have beliefs that may be mistaken, and that cause them



to act in certain predictable ways. These children are then able to capitalize upon this information in order to employ tactics designed to convey to others as true what they know to be false (Hala, Chandler, & Fritz, 1991). What these studies provide is very real and concrete support for the fact that even before the age of four, children are beginning to develop very early theories of mind. It also suggests that theory of mind can be considered as following a certain developmental trajectory that one can measure through the use of various tasks.

This suggestion that theory of mind follows a specific, largely predictable developmental pattern, was confirmed by Wellman, Cross, and Watson (2001), who conducted a meta-analysis of the data involving theory-of-mind development in an effort to clear up some of the theoretical controversy and contradictory findings regarding preschoolers and false belief. The researchers stressed the considerable need for a grouping of the data across studies; an overwhelming number of studies produced a combination of above-, at-, and below-level responding on false-belief tasks, and something needed to be done to clear up the controversy over the nature of children's performance (Wellman, Cross, & Watson, 2001).

The basic finding produced by the meta-analysis, which spanned 591 false-belief conditions, was the confirmation of a developmental effect on false-belief performance. Therefore, as a child's age increases, his/her performance also significantly increases. This can be interpreted as providing support for the theory that there is significant development of false belief understanding that occurs during the preschool years (Wellman, Cross, & Watson, 2001). Another finding with important implications was that there was no significant effect of false belief task

variations. This then means that children's performance across studies was not significantly influenced by variables such as the type of task, question, protagonist, and/or target object used by the experimenters. This is a critical finding in terms of theory, because it conveys the fact that children's false belief judgments are not likely to be the result of responses that are task-specific, but rather the result of their strong, innate comprehensions of the belief states of humans, as well as the potential actions that result from these states (Wellman, Cross, & Watson, 2001). What Wellman, Cross, & Watson (2001) found, then, can be summarized comprehensively by saying that while children's performance may vary according to the types of tasks and the phrasing of questions used by experimenters, they will eventually, as they develop, begin to understand all of the tasks. By the time children reach the age of four or five, they have achieved a fully developed theory of mind, and therefore would be expected to comprehend all types of false belief tasks. However, the researchers still suggest that one use a series of varying false belief tasks in order to obtain the most valid measure of a child's theory of mind.

Wellman and Liu (2004) performed a study to test all previous false-belief tasks that had been utilized by researchers in theory of mind studies, with the goal of creating a standardized battery of false-belief tasks to test theory of mind in preschoolers. Because it can be assumed that children who are developing normally acquire certain insights about the mind in a largely predictable order, the researchers hypothesized that these insights reflect and catalog an underlying developmental sequence that one could identify and measure in a theory of mind scale (Wellman & Liu, 2004). In order to select tasks for their theory of mind scale, the researchers

performed a meta-analysis to summarize previous research comparing types of theory of mind reasoning with one another. In this meta-analysis, as opposed to that of Wellman, Cross, & Watson (2001) the researchers wanted to analyze mental states rather than types of task, therefore determining which mental-state concepts were easier to grasp for children of preschool ages. One can imagine a variety of feasible outcomes resulting from the researchers' meta-analysis. One is that they would find all mental states to be equally difficult for children to comprehend; they are, after all, internal states that may often contrast with observed external appearances and behavior. Another equally feasible possibility is that the researchers would find that children more easily grasp certain states before others, and that which states are understood earlier and which later would vary from child to child. Factors affecting this variance could range from unique individual experiences to types and amount of dialogue conducted within the family involving topics such as wants, beliefs, and/or emotions. However, what the researchers actually found contrasts with both of the previously described possible outcomes: the data from the meta-analysis showed that there is a clear and regular pattern to the development of children's theory of mind (Wellman, Cross, & Watson, 2001).

In the second part of their study, Wellman, Cross, & Watson (2001) developed a scale of theory of mind consisting of seven tasks designed to reflect the distinct pattern they found in their data showing that, according to their age, children would be expected to pass certain tasks before others. Their scale therefore consisted of tasks that varied in their level of cognitive complexity, so that children would be expected to pass the earlier tasks more easily, and to have more trouble with the later

tasks. Taken all together, the previous studies outlined indicate that as early as the age of two-and-a-half or three years old, children are beginning to comprehend deception and theory of mind. This knowledge continues to grow and increase until it is nearly fully developed at the age of four or five years, no matter the type of questions or tasks being used by the experimenter to test theory of mind.

Because so much of the development of mental state understanding and theory of mind takes place between the years of two-and-a-half and five, it makes great sense to suggest that the preschool environment is the stage on which much of this development takes place. Much research has been conducted exploring the link between theory-of-mind abilities and various types of behavior patterns displayed by children within the preschool classroom setting. The understanding of mental states and their resultant actions is such a unique and crucial ability, that it would be fair to argue that it is connected to practically every behavior that a child can be observed engaging in while spending time in the classroom. The connection between theory of mind and preschoolers' pro-social behavior is of particular interest in the current study, and so it is to this topic that the most attention is dedicated. There is a large body of previous research describing the relationships between preschoolers' theory of mind, temperament, and factors related to prosocial behavior such as empathy, social competence, and peer acceptance.

Prosocial behavior is defined as one's engagement in voluntary actions that are intended to help or benefit another individual. It has been observed that human neonates will display rudimentary responses to the distress of other infants as early as two days old (Simner, 1971). Simner (1971) described this rudimentary response as

the “contagion of crying,” wherein an infant will respond to another infant’s cries by crying him/herself. Zahn-Waxler, Friedman, and Cummings (1983) observed infants’ responses to children crying for their bottles, and found that common responses to the infants’ distress included verbal, gestural, and physical help. This was true for children in each age/grade, ranging from four-year-olds to sixth graders. Rates of physical interventions and help were also observed to increase with age.

It is frequently suggested that young children’s prosocial behavior may be prompted by empathy (Ginsburg, Ogletree, Silakowski, Bartels, Burk, & Turner, 2003). Ginsburg et. al. (2003) therefore conducted a study exploring preschoolers’ abilities to understand and distinguish between empathic and selfish motives in the context of helping behavior. The researchers hypothesized that those children who display a distinct ability to differentiate between empathic and selfish motives will have more developed theories of mind about the empathic and selfish intentions of others (Ginsburg et. al., 2003).

In their study, Ginsburg et. al. (2003) presented forty-one 36-66 month-old children with stories acted out by three pipe cleaner figurines. A yellow pipe cleaner figurine represented a person showing distress at the sound of an alarm, while the two other red and green pipe cleaner figurines went over to the timer that activates the alarm and pressed a button to terminate the sound. Either the red or the green figurine was presented with an empathic reason for terminating the alarm (“Because I do care about the friend – and the noise was hurting my friend’s ears”) while the other figurine was presented with a selfish reason for terminating it (“Because I do not care about the friend – and the noise was hurting my own ears.”) The researchers had six

interview items that served as the predictor variables and were designed to measure the participants' theories of mind regarding the selfish or empathic motives of the two pipe cleaner figurines that act to turn off the alarm sound. These six items described the figurines' empathic or selfish motives in three other situations in which a friend falls down, a friend loses a snack, and a friend finds a snack. It was expected that these items would reflect each child's ability to predict reliably the motives and acts of others (Ginsburg et. al. 2003).

The researchers found that almost 60% of the children interviewed were able to restate the reasons given by the figures for their actions, and to distinguish between empathic and selfish motives correctly. They posited that this fairly low percentage could be attributed to the language aspect of their inclusion criteria - it may have been difficult for the younger children to follow and remember all of the verbal aspects of the story-telling, and to verbally explain their reactions to what they saw in the stories. Previous research has supported the possibility that young children feel empathy themselves and comprehend empathic intentions in others, yet lack a linguistic ability advanced enough to convey this understanding verbally (Zahn-Waxler, 1991). However, the researchers did find that those children who were able to predict the motives of the pipe cleaner figurines consistently were also more empathic; they were more likely to give an empathic reason for terminating a loud alarm sound, saying that they wanted to stop it because it hurt their friend's ears. Performance on theory of mind tasks additionally predicted a proclivity for sharing a snack with the figurine that gave empathic reasons for its actions (Ginsburg, 1991). It seems that theory of mind and the ability to understand the difference between selfish

and empathic motives of action are connected, and those children who more easily comprehend and differentiate between the two types of motives would be expected to engage in more empathic and prosocial behavior and less aggressive behavior within the preschool setting, therefore becoming more accepted by peers.

There have been many studies conducted exploring the relation between theory of mind and peer acceptance in preschoolers. Slaughter, Dennis, & Pritchard (2002) explored this idea in their work, and described previous research indicating that disparities in theory of mind abilities in young children are at least somewhat connected to their unique social experiences. They hypothesized that theory of mind is, in turn, related to children's levels of peer acceptance, or the extent to which they are accepted or rejected by their peers. It can be argued that a child with a more advanced theory of mind will be more popular within his/her peer group due to his/her superior ability to interpret the mental states (desires, beliefs, thoughts, and/or feelings) of other children. Studies have also shown that theory of mind is related to perspective-taking and empathy in children (Flavell & Miller, 1998; Zahn-Waxler, 1991). This high level of interpersonal understanding would lead to the child being better-liked within his/her larger peer group.

Badenes, Estevan, and Bacete (2000) also investigated the link between theory of mind and preschoolers' peer acceptance, measuring four- to six-year-olds' theory of mind abilities with various tasks. The researchers also measured the children's peer acceptance using a peer nomination method. When they compared the popular, average, and rejected boys and girls, they found few differences between them on the theory of mind measures. The children's performance on theory of mind tasks did not

vary with peer acceptance, except for the popular girls, who performed significantly better than did the average or neglected girls on a deception task (Badenes, Estevan, & Bacete, 2000). They also found that the boys who were classified as rejected had significantly worse performance on one theory of mind task, the white lie task. In tasks involving explanations of others' behavior, these boys also made significantly more antagonistic attributions. Another finding that is worthy of note is that these results were true of the older age group of rejected boys (age six), but not for the younger group. This finding supports the idea that it is the cumulative effect of peer rejection or peer acceptance throughout development that so impacts children's social growth (Badenes, Estevan, & Bacete, 2000). The body of research that has accumulated on the topic of theory of mind and how it relates to peer acceptance has failed to produce any apparent agreement, but the published studies' results do tend to indicate the trend that those children who are most popular with peers and possess the most social skills are those who have more highly developed theories of mind.

Slaughter, Dennis, and Pritchard (2002) found a modest positive correlation between theory of mind and peer acceptance, but they also found that differences in social-cognitive skills and capabilities have a stronger influence on peer acceptance as children progress in age. The researchers also found that measures of prosocial behavior proved to be the most significant indicator of peer acceptance in their sample of preschool children, which is in line with previous research indicating that degrees of prosocial behavior are one of the most reliable means of differentiating between popular and rejected children (Bukowski & Newcomb, 1984). It is therefore important to study the link between theory of mind and prosocial behavior. Slaughter



et. al. (2002) did investigate this link in their studies, but they found that after the influences of age and verbal ability were removed, the correlation between theory of mind ability and prosocial behavior was not significant. However, the researchers state that because of the theoretical and empirical nature of the connections between theory of mind and prosocial behavior (Dekovic & Gerris, 1994), it is necessary to examine the relationship between the two further (Slaughter et. al., 2002).

It has been shown that even in late infancy and in the preschool years, children display the ability to accept some personal sacrifice in order to respond to others' wants and needs (Moore, Barresi, & Thompson, 1998). For example, toddlers are willing to share their toys with others even when toys are scarce (Hay, Caplan, Castle, & Stimson, 1991), and during the second year of life, children begin to display other-oriented behavior when they encounter another person in distress. Prior to this time the child would have sought comfort for him/herself, but he/she then begins to switch to comforting the other, perhaps sharing a special toy or hugging the other in distress (Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992). A main focus of the research has centered on how individual differences in prosocial behavior are affected by variables such as personality and the social environment. For example, responding to the distress of others has been linked to maternal warmth (Robinson, Zahn-Waxler, & Emde, 1994), as well as to a child's temperament, which was a focus of the present study, and will be discussed later in detail.

Much attention has also been centered on the psychological processes that are involved in prosocial behavior. It has been well established that prosocial behavior has emotional foundations, but it also necessitates specific cognitive capabilities. An

example of this involves the change that takes place in the second year of life, described above, a shift from self-focused comforting behavior to other-focused comforting behavior. It has been suggested that this change is dependent on the child's faculty for secondary representation, an aspect of theory of mind (Perner, 1991, cited in Moore, Barresi, & Thompson, 1998). This would imply that the child understands that the distress he/she feels is empathic, and is a reaction to emotions originating with the other person. It has also been posited that in later preschool years, additional changes in prosocial behavior occur as a result of the child's developing ability to engage in reasoning that is oriented toward the future, as well as to delay gratification (Thompson, Baressi, & Moore, 1997). More recent research has been conducted on the development of future-oriented prosocial behavior and its relationship to both the development of theory of mind and executive functioning. The latter two abilities have been established as displaying developmental changes around the age of three or four years, and it has been suggested that they are developmentally connected.

Because of the parallel results regarding age differences found by researchers studying theory of mind, executive functioning, and prosocial behavior, as well as the supposed theoretical connections between them, Moore, Barresi, and Thompson (1998) set out to explore the relationship between performances on tasks measuring each concept. The researchers studied children aged three years to four-years-and-six-months, presenting them with a sequence of trials in which they were given the choice between an immediate and a delayed reward of stickers. This reward either went solely to self, solely to a play partner, or it was shared, with both self and play

partner receiving stickers. Additionally, in Experiment 1, the children were asked to participate in standard theory of mind tasks designed to measure belief and desire comprehension. In Experiment 2, they also took part in an executive functioning task in which they had to refrain from pointing to a baited box so that they could win the cookie inside of it. The results of Experiment 1 supported the belief that theory of mind and future-oriented prosocial behavior are connected: the four-year-old children who showed more advanced comprehension of others' beliefs and desires were most likely to delay gratification so as to share stickers with a partner, or to let the partner alone receive a sticker. In Experiment 2, results showed that those children in the youngest group (those younger than three years and five months) who displayed poor performance on the baited box task were also likely to pick the immediate reward for self option in the sticker reward choices. This indicates that the failure of the children to delay can be attributed to a lack of ability to detach from the immediate reward; it is difficult for them to remove themselves from the stimulus and inhibit action so as to perform a more goal-oriented behavior instead. However, this correlation did not hold for the older children, indicating that executive functioning may play a larger part earlier on in the development of future-oriented behavior (Moore, Barresi, & Thompson, 1998).

These results seem to suggest that those children with more developed theories of mind are more likely to engage in future-oriented sharing behaviors; the children who were able to pick the delay option in both the sticker reward and baited box tasks must think about the mental states of themselves and of others, while simultaneously restraining their desires for the immediate reward. However, because

the study was correlational in nature, it is difficult to determine what is affecting what. It is possible that the changes that take place in theory of mind and executive functioning are somehow dependent on the development of the capacity to partake in future-oriented behavior, but it's also equally possible that the development of future-oriented prosocial behavior depends on one cognitive capacity, and once in place it promotes the development of other cognitive transformations (Moore, Barresi, & Thompson, 1998). However, it is important to reiterate the age differences observed in this study: the researchers observed the significant associations between executive functioning and future-oriented prosocial behavior in the younger three-year-olds, while the significant associations between theory of mind and future-oriented prosocial behavior were observed in the younger four-year-olds. This age difference is consistent with previous research positing that early in development, executive functioning plays a central role in future-oriented prosocial behavior, but later on in development, a growing theory of mind is more important. While it is difficult to pinpoint the exact nature of the correlational relationship in this study, it is clear that there are definite relationships between a child's ability to act in ways so as to benefit another's future interests, his/her ability to inhibit certain strong and immediate responses to perceptual stimuli, and the development of his/her theory of mind (Moore, Barresi, & Thompson, 1998). Especially for pre-schoolers, who are relatively far along in this process of growth and development of executive functioning and theory of mind, one would expect to see a connection between the children's theory-of-mind abilities and their tendencies to inhibit immediate gratification for

themselves, to take others' desires into account, and to engage in prosocial behaviors such as sharing.

Hay, Payne, and Chadwick (2004) conducted a thorough review of children's social development from the toddler years to mid-elementary school years, consolidating and interpreting the findings in order to highlight certain trends in development. The researchers discuss the role of social understanding during the preschool years in creating children who are successful in their peer relationships. They cite studies exploring how deficits and biases in abilities related to theory of mind and social-information processing play a role in peer relations, a phenomenon that is observed especially in the early childhood years. It is during these years, as has been discussed throughout this paper, that children begin to understand mental states of others, especially desires and beliefs, and also develop their abilities to produce solutions to interpersonal problems (Hay et. al., 2004). Hay et. al. (2004) additionally describe the widely-supported view that theory of mind and social competence are related, and also cite research showing that the comprehension of white lies and deception is linked to the promotion of a child's positive status within his/her peer group. Theory of mind abilities have also been found to be greater among those children with more advanced verbal abilities, who have a friendship that is mutual, and who are popular among peers (Peterson & Siegel, 2002).

Problems in social understanding can arise from both deficits and biases in theory of mind abilities. For instance, one facet of theory of mind is the capacity to understand the intentions of others, and the misunderstanding or misattribution of another person's intentions is related to peer problems that increase in severity as

time passes. The misattribution of peers' intentions has been linked to a variety of negative outcomes, such as frustration and the child's angry and aggressive acts of retaliation resulting from his/her perception of being provoked or aggravated (Schwartz et. al., 1998). Peer groups have negative evaluations of this kind of reactive aggression, and it is thus correlated with victimization. It is clear from these findings that shortcomings in cognitive skills such as theory of mind abilities have negative outcomes for children's social interactions and peer relations during the preschool years. The relationship between executive functioning and theory of mind is also outlined by Hay, Payne, and Chadwick (2004), who describe studies indicating that "hard-to-manage" children display not only deficiencies in the ability to impute the mental states of others, but also impairments in inhibitory control. Research has also been conducted to investigate how peer status is affected by children's abilities to comprehend lies and mistakes.

Peterson and Siegel (2002) conducted a study to investigate the relationships between peer relations, the development of children's abilities regarding the moral comprehension of differences between lies and mistakes, and their theories of mind based on performance on standard false belief tests. The researchers describe findings from previous studies that those preschoolers who are classified as rejected are slower than their less-rejected peers are to understand the differences between actions that are universally regarded as wrong, and those that are widely accepted as wrong because of subjective social conventions. They therefore reasoned that there might be a connection between children's popularity among peers and their more advanced moral understanding of lies, and also between rejected children and deficiencies in

moral understanding. The researchers hypothesized that those children with the most developed theory of mind, especially those with a more developed awareness of false belief on standard tasks, would be the most cognitively well-equipped to understand the consequences of a liar's deliberate attempt to promote false belief within his/her listeners. These children should also more readily utilize their cognitive and moral understanding to pardon unintentional lies verbalized by others in realizing that they can be based on the other's beliefs that do not coincide with reality (Peterson & Siegel, 2002). Furthermore, it was suggested that those children with stable mutual friendships would have more developed abilities to comprehend false belief. This relationship, it is important to note, can go in either direction; children who have a stable mutual friendship have more opportunities to interact closely with a peer and learn social skills that contribute to theory of mind development, or conversely, a child with a more advanced theory of mind may be a more desirable candidate for a mutual friendship because of his/her awareness of false belief and interpersonal awareness.

Each child in the Peterson and Siegel (2002) study was tested individually on measures of theory of mind (false belief), language ability, moral understanding (understanding lies and mistakes, and the difference between them), and peer acceptance. Their results indicated clear and definite relations between peer acceptance, the social cognitive skill of mindreading, and moral understanding. The children who were classified as rejected within the entire peer group, and who were reported as having no stable mutual friendships, were also the children who scored the most poorly on theory of mind tasks. They were also behind their popular

classmates who had stable mutual friendships in terms of understanding the moral difference between deliberate lies and mistakes. Again, one must carefully consider the two directions this relationship can take. Perhaps these rejected children scored poorly on tests of these social cognitive functions because of their lack of satisfactory interactions with peers; their opportunities to practice pretending, deception, telling lies, and mindreading are much more limited because of this, and they are therefore put at a disadvantage for important social and cognitive growth. On the other hand, perhaps children who are already delayed in their mental state awareness and moral understanding have a weakened ability to connect with peers and create lasting stable friendships and/or gain peer acceptance in the classroom (Peterson & Siegel, 2002).

The researchers also found an interesting pattern concerning the ways in which peer relations influence moral understanding and false belief understanding. Among the children who were classified as rejected by the peer group generally, those who still had a stable mutual friendship performed just as well as popular children with lasting mutual friendships in distinguishing between lies and mistakes. This would suggest that stable mutual friendships had a compensating effect for the rejected children who did not have the same social interaction advantages as their popular peers. However, in terms of theory of mind and false belief performance, popular children with stable mutual friendships performed better than did popular children without any such stable mutual friendships, and rejected children without any stable friendships predictably performed the worst out of all the groups. Results of regression analyses additionally showed that mutual friendships “made a statistically significant independent contribution to advanced development” (Peterson



& Siegel, 2002; 221) for false belief but not for moral understanding, even after controlling for preferences and rejection by the wider peer group. Perhaps a deeper kind of insight into the minds of others is needed in order to impute their false beliefs than to understand their deceptive intentions.

The last important finding to note about the study by Peterson and Siegel (2002) is that while there was a correlation established between the preschoolers' scores on theory of mind and moral understanding tasks, the researchers failed to find that one or the other of these social cognitive functions must be in place before the other can develop. An advanced understanding of false belief did not have any independent effect on a moral understanding of the distinction between lies and mistakes when variables such as verbal ability, age, and peer popularity were controlled for, and the same was found for the effect of moral awareness on theory of mind development (Peterson & Siegel, 2002). What this means is that preschoolers' rates of development of the social cognitive functions necessary for the understanding and use of false belief, lying, and deception are affected by a number of factors, including age, social environment, status among peer groups, stable friendships, and verbal ability. It has also been suggested that temperament plays a role in theory of mind development, and also in how individual children use their theory of mind skills to behave in certain ways, for example, prosocially or antisocially (Ronald, Happé, Hughes, & Plomin, 2005).

The current study sought to explore the nature of the relationship between preschoolers' theory of mind abilities and prosocial behavior. Research into how children's individual temperaments affect their prosocial behavior and theory of mind

development, however, is scarce. However, certain studies have produced findings that help to formulate hypotheses about how temperament may play a role in these types of social cognitive functions. Ronald, Happé, Hughes, and Plomin (2002) found that as two- and three-year-old children begin to develop theories of mind, they use the accompanying skills and knowledge in either “nice”, prosocial ways (e.g. attempting to intervene in fights and resolve conflicts), or “nasty” ways (e.g. placing the blame on others for certain things), depending on their temperament, as well as other factors such as social aims (Ronald et. al., 2002; 680). The researchers also suggested that one possible hypothesis regarding how the development of theory of mind relates to preschoolers’ engagement in prosocial and antisocial behavior is interactionist in nature. This indicates that theory-of-mind ability interacts with children’s individual differences in temperament in order to generate behaviors that vary among children. However, because no studies have looked simultaneously at the effects of temperament and theory of mind ability on the development of prosocial behavior, it will be necessary to explore the literature on each factor individually.

It is generally accepted that temperament is an important factor to consider when investigating children’s social behavior. Much research has been conducted in order to explore the factors that are most salient in determining the development of children’s social behavior during the preschool years, and temperament is frequently cited as one of these important factors. A study by Diener and Kim (2004) investigated the role of child temperament and maternal characteristics on preschoolers’ social competence in the classroom, citing the fact that prosocial behavior has been shown to predict greater social competence in the childhood years,

as well as in adulthood (Eisenberg et. al., 1999). Diener and Kim (2004) focused on three aspects of children's social competence in their study, including prosocial behavior, social withdrawal, and externalizing behaviors. Behavior that is classified as socially competent implies engagement in effective social interactions, including the ability to get along well with others, prompting or joining play with others, and resolving disagreements with peers (Rose-Krasnor, 1997), and prosocial behavior, such as helping others, is a sign of social competence because it promotes more successful peer relations. Other studies have found support for the connection between sociability

Stanhope, Bell, and Parker-Cohen (1987) investigated how the interaction of children's temperaments with situational factors affected 24 preschoolers' engagement in helping behaviors. The children were given four different opportunities to help a female researcher, all of which took place in the laboratory during a play session. Mothers completed questionnaires designed to assess their children's helpfulness in the home setting. The researchers also collected multiple measures of sociability from mothers and preschool teachers, as well as a more broad dimension of temperament they termed "social adaptability". This dimension combined the Approach/Withdrawal, Adaptability, and Mood scales of the Behavioral Style Questionnaire (Carey, Fox, & McDevitt, 1977), and the researchers hypothesized that children who more easily adapt to new situations and have more positive moods would be more likely to engage in helping behaviors than children who are lower on these dimensions. They also posited that those children who score

higher on Buss & Plomin's (1984) temperament dimension of sociability would tend to be more helpful.

The researchers found that the children's sociability was significantly positively related to their helping behavior in the laboratory environment, but not in the home. They explained this phenomenon by reasoning that in the unfamiliar setting of the laboratory, the person who needed help was a stranger, a factor that could have affected the sociable and unsociable children in differing ways. They also found that children's social adaptability was significantly positively related to their mothers' ratings of their helpfulness at home, but not to their helpfulness scores in the laboratory, most likely because this measure relied on mothers' memories of their children's reactions to various situations with familiar people (Stanhope, Bell, Parker-Cohen, 1987). The results of this study provided support for the idea that temperament is related to children's helping behavior, specifically the dimension of sociability, which affects children's helping behavior when interacting with a stranger in the laboratory setting (Stanhope, Bell, & Parker-Cohen, 1987). Other studies have found support for the connection between a children's sociability and their proclivities for behaving prosocially in certain situations, citing positive correlations between preschoolers' helping behavior in the classroom and the number of social interactions in which they were involved (Eisenberg, Pasternack, Cameron, & Tryon, 1984; Eisenberg-berg & Hand, 1979).

Diener and Kim (2004) decided to look at the combination of temperament, specifically the dimension of emotionality, and self-regulation, to see how the two acting together affect children's prosocial behavior and social competence. They

suggested that for those children who are temperamentally more likely to experience high levels of negative affect, self-regulation is especially critical in order to smooth social interactions with peers. They also cited the hypothesis put forth in previous research by Eisenberg and Fabes (1992) positing that children who have high negative emotionality but who also are high on self-regulation will engage in more prosocial behavior than those children who have high negative emotionality but are also poor self-regulators (Eisenberg & Gabes, 1992, cited in Diener & Kim, 2004). A study by DiLalla (1998) also looked at the effect of preschoolers' self-regulation abilities and emotionality on their social competence. In her study, DiLalla observed the connection between children's temperaments as rated by their parents, and their social behavior, and her findings indicated that children whose parents described them as having an easy temperament displayed more prosocial behavior in an interaction with an unfamiliar peer. A study by Farver and Branstetter (2004) observed children's responses to their peers' distress in the form of crying, and found that again, those children who were rated as having an easy temperament by parents were most likely to react to their peers' distress with prosocial behaviors, while those children who were rated as difficult were least likely to do so.

In Diener and Kim's (2004) study, the researchers asked 110 mothers to complete questionnaires about their children's temperament and self-regulation, as well as self-reports of their maternal separation anxiety. The researchers also coded mothers' interactional styles with their children from videotapes, and each child's teacher completed questionnaires on the child's social competence. Their findings showed that the preschoolers' social competence was predicted by all three factors of

maternal characteristics, child temperament, and child self-regulation, as well as by the presence of a familiar classmate. The risk factors that predicted less prosocial behavior included the expression of higher levels of anger, as well as inhibition (similar to shyness); high levels of activity; poor self-regulation; mothers who expressed more anxiety upon separation from their child; and the absence of a familiar classmate (Diener & Kim, 2004). These findings align with previous studies showing that older children's emotionality and self-regulation abilities predict social competence, as well as studies showing that preschoolers' emotional and temperamental traits, along with their self-regulation abilities, are important predictors of their behavior among peers (Eisenberg et. al., 1993).

Blair, Denham, Kochanoff, and Whipple (2004) similarly studied the relationship between temperament, emotion regulation, and social competence in preschoolers, citing the following statement by the National Research Council and Institute of Medicine: "research is revealing the large extent to which the task of learning how to manage one's emotions...is a different challenge for children with different temperaments..." (National Research Council and Institute of Medicine, 2000, p. 114, cited in Blair et. al., 2004). Emotion regulation has been defined in many ways, but can be summed up as the interaction of various complex cognitive and behavioral processes working together to regulate affective experiences (Blair et. al., 2004). Studies have shown that emotion regulation plays a critical role in many aspects of the development of successful social behavior; it is crucial for preschoolers to develop knowledge of socially acceptable behavior, and additionally contributes to their status among peers, their adjustment and their sympathy (Eisenberg, Fabes,

Guthrie, & Reiser, 2002). All of these, in turn, have been shown to be important factors that are related to the development and preservation of children's social relationships.

Blair et. al. (2004) cite the connection between temperament and various definitions of emotion regulation, as well as temperament's clearly established effects on childhood behavior, and posit that children's tendencies toward various types of temperament might, in combination with their coping and/or regulation abilities in the face of negative affective experiences, predict these children's social outcomes. A more complete understanding of this relationship between temperament and emotion regulation abilities would be beneficial, as it would help to explain what causes particular children to be aggressive or prosocial, as well as adjusted and maladjusted.

While the relationship between temperament dimensions and socially competent behavior development has received relatively little attention compared to that focused on temperament's connections to maladaptive behavior, it has been established that temperament dimensions directly forecast future prosocial behavior. Many literature reviews of this type of research indicate a linear relationship between temperament and social competence (Rothbart & Bates, 1998). An example of this relationship would be findings indicating that preschoolers who have "easy" temperaments, or who are quickly soothed and are persistent, tend to engage in more socially competent behaviors (Kochanska, 1997) than do their peers who are identified as being less "easy." However, studies that have looked at both socially competent and incompetent behaviors, have consistently found a stronger direct connection between temperament dimensions and negative outcomes than that

between temperament and prosocial behaviors (Nelson, Martin, Hodge, Havill, & Kamphaus, 1999).

Blair et. al. (2004) cite the fact that research has also shown that temperament may interact with the development of social competence in a more differentiated way. For example, studies have produced findings indicating that other factors, such as verbal ability or intelligence may interact with temperament dimensions in order to predict behavior that is socially competent (Rothbart & Bates, 1998). Additionally, it is believed that temperament primes children for certain development courses that largely determine adjustment (Rothbart & Bates, 1998). This proposition can be reframed as a “vulnerability or predisposition” (Blair et. al., 2004, pp. 423) model, describing the way in which differences in temperament might be altered during the course of developmental processes, transforming into other types of adjustment that are more complex (Rothbart & Bates, 1998). Therefore, certain temperament dimensions may prompt an individual towards specific outcomes, but other developmental processes might play a considerable role in forecasting adjustment as well. While it is clear that more research is needed in order to tease out the exact nature of the connections between temperament dimensions, self-regulation, and social behaviors, it is clear that temperament plays a significant role in the development of social relationships. It is important to take temperamental dimensions into account when investigating preschoolers’ social behavior in order to identify which types of dimensions might promote or inhibit the healthy development of social competence, and specifically prosocial behavior.



The current study, through the use of the series of seven theory of mind tasks analyzed and validated by Wellman and Liu (2004), sought to explore the relationship among children's temperaments and theory of mind abilities on their levels of prosocial behavior. Children between the preschool ages of four and five participated in the seven false-belief tasks to measure the development of their theory of mind comprehension. Additionally, the children's parents/guardians were asked to complete a temperament questionnaire for their child, as well as a demographic questionnaire. The preschool children's teachers were also asked to fill out a brief prosocial behavior questionnaire about each child. It was hypothesized that prosocial behavior would positively correlate with performance on false belief tasks. Children who are more developed in their theory of mind abilities also possess greater interpersonal awareness and mental state understanding, and so will be more likely to engage in prosocial behaviors such as helping and sharing. A secondary hypothesis was that the sociability dimension of temperament as described by Buss (1991) would correlate positively with children's theory of mind performance as reflected by their scores on the false belief tasks. Children who are more social seek out more social interactions, are more at ease with peer relations, and are more responsive to those around them, thus being more likely to engage in play with their peers (Farver & Branstetter, 1994). Interactions with peers have a large effect on children's development of social skills, and therefore sociable children are most likely to cultivate the skills and awareness needed for an understanding of mental states, a large aspect of theory of mind. Children who are more social and who have better performance on false belief tasks are also predicted to engage in more prosocial

behavior. Also, children who rate higher on the problem behavior of shyness as described by Buss (1991), which was also measured by the temperament questionnaire, would be expected, due to their reluctance to interact with peers, to have poorer performance on theory of mind tasks, and also to engage in less prosocial behavior (Farver & Branstetter, 1994). The effect of the emotionality dimension as described by Buss (1991) on theory of mind is not easily predicted, but perhaps children who are more emotionally reactive and more prone to anger and fear would have less successful and more volatile interactions with peers, causing a possible slight negative correlation with theory of mind, and therefore also with prosocial behavior. The dimension of activity level (Buss, 1991) is also not expected to have a significant relationship to theory of mind, because there is no theoretical indication that children's activity levels have any significant relationship to their understanding of mental states.

In sum, the main hypothesis of the current study was that those children who have better developed theories of mind as reflected by performance on false-belief tasks would also score higher on a measure of prosocial behavior, while those children who have less developed theories of mind would score lower on prosocial behavior. Additionally, it was predicted that theory of mind scores and prosocial behavior scores would correlate positively with the temperament dimension of sociability, and would correlate negatively with the temperament dimensions of shyness, and, to a lesser extent, emotionality.

## **Method**

### **Participants**

The participants of the current study included 42 preschool and kindergarten children (21 males and 21 females), ranging in age from 39 to 72 months ( $M = 53.56$  months,  $SD = 7.43$  months). The current sample of children included 11 three-year-olds, 23 four-year-olds, seven five-year-olds, and one six-year-old. All the children were students, with nine enrolled in one local school, and the remaining 33 enrolled in a different local school. Most children were either first-born ( $N = 15$ ) or second-born ( $N = 17$ ), but some were only children ( $N = 7$ ), and very few were third-born ( $N = 3$ ). All children but one lived with both parents ( $N = 41$ ). The one child who did not live with both parents was an adoptee living with her adoptive mother. Lastly, parents' education levels were measured, and it was found that all parents had at least obtained a four-year college degree ( $N = 83$ ), but most had also received a higher degree, such as a master's degree ( $N = 34$ ), and an MD/JD/PhD/Post Doctoral ( $N = 33$ ).

### **Materials**

To obtain parents' permission for their children to participate, the parents were sent a packet of information that contained a cover letter explaining the study (see Appendix A), a consent form (see Appendix B), a demographic questionnaire (see Appendix C), and Buss and Plomin's EAS Temperament Questionnaire (1984). The demographic questionnaire included questions about the child's age, ethnic background, birth order, and each parent's highest level of education. The Temperament Questionnaire by Buss and Plomin (1984) is comprised of 20 questions

designed to measure children on four subscales of temperament, which are Emotionality (e.g., “Child often fusses and cries”), Activity (e.g., “Child is very energetic”), Sociability (e.g., “Child makes friends easily”), and Shyness (e.g., “Child takes a long time to warm up to strangers”). Each subscale was measured by five of the 20 questions, and all questions were scored on a Likert scale, with 5 being “*very characteristic of my child*”, and 1 as “*not characteristic of my child.*” High scores on the subscales of emotionality, activity, sociability, and shyness indicate children who display higher levels of each of those dimensions. To ensure confidentiality, each child was assigned an identification number to be certain that his or her name was not needed during data collection and analysis.

Each child’s understanding of theory of mind was measured using the battery of standard false belief tasks taken from a study done by Wellman and Lui (2004). The battery included seven false-belief tasks, designed to be conducted in a certain order as described by the researchers. Each of the tasks required different props in order to facilitate the description of the storyline to the children. The props were as follows: three figurines of boys; one figurine of a girl; a small plastic toy pig; a small plastic toy dog; an empty band-aids box; an empty Cheerios single-serving size box; a non-descript white box; and rocks. Three drawings were also used as props in the storylines of three of the tasks: one drawing of a cookie and a carrot; one of a set of bushes and a garage; and one of a happy face, a neutral face, and a sad face. The children’s responses to each task were recorded on Task Data Sheets (Appendix D).

Each child’s prosocial behavior was measured using a questionnaire adapted from Weir, Stevenson, and Graham’s (1980) Prosocial Behavior Questionnaire for

Teachers. Weir et. al.'s original questionnaire is 20 items long, so in order to shorten the length, ten items were selected which were found by Tremblay, Vitaro, and Gagnon (1992) to load most highly on the prosocial component of their factor analysis. The current questionnaire was therefore comprised of these ten questions, completed by each participant's classroom teacher, scored on a Likert-type scale, with 1 being "*Rarely applies*", and 3 being "*Certainly applies*." Sample items include, "Will invite bystanders to join in a game", and "Comforts a child who is crying or upset." Possible scores ranged from 10 to 30, and a higher score indicated a more prosocial child. The internal reliability of the scale was calculated, and Cronbach's alpha for the ten items was found to be 0.84.

### **Procedure**

Packets of information were put into each child's mailbox at their school, so that parents could pick them up. Each packet contained a cover letter, a consent form, a demographic questionnaire, and the Buss and Plomin Temperament Questionnaire (1984). When parents returned the packet with the consent form completed, and permission for their child to participate had been obtained, a time was set up with each preschool for the researcher to complete the theory of mind tasks with the children.

For testing of the theory of mind tasks, the researcher entered the classroom and asked each child individually whether or not he/she would like to play a few games with her. All children but two agreed to play. The two who were not willing were informed that it was okay that they did not want to play, and were removed from

the sample. Once each child agreed to play, he/she sat at a table with the researcher in a quiet corner separated from the rest of the classroom by a divider.

The researcher worked individually with each child, reading the series of seven false-belief stories (Wellman & Liu, 2004) in one of six different random orders. Verbatim instructions of each task can be found in Appendix E. According to Wellman and Liu (2004), the seven false-belief tasks are progressively more difficult, and therefore must be presented in such an order that the *Diverse Desires* and the *Diverse Beliefs* tasks were always presented either first or second, and the *Real-Apparent Emotion* task was always last. The remaining four, which were the *Knowledge Access*, *Contents False Belief*, *Explicit False Belief*, and *Belief Emotion* tasks, were assigned a random order in between the three others. Scores were obtained by giving one point to each task if the child answered both of the task's target questions correctly. Once all questions were answered, the researcher thanked the child, let him/her pick out a sticker as a thank-you reward, and then sent him/her back out into the classroom.

On the same day that the researcher went into the classrooms to conduct the theory of mind tasks with the participants, she also distributed the Prosocial Behavior Questionnaire for Teachers (Weir, Stevenson, & Graham, 1980) to the participants' primary teacher(s), asking them to take their time in completing the questionnaires, and explaining how to fill them out. The researcher and the teachers agreed on a time for the researcher to return and collect the completed questionnaires. The interval of time that passed between the researcher distributing the questionnaires and re-

collecting them from teachers ranged from one to four days depending on the classroom.

## Results

The means and standard deviations of all variables are reported in Table 1. T-tests comparing males and females on all of the major dependent variables showed that there were no significant differences between boys and girls on any of the variables measured, including shyness  $t(40) = -.82, p = .42$ ; sociability  $t(40) = .54, p = .59$ ; emotionality  $t(40) = .18, p = .86$ ; activity  $t(40) = .299, p = .77$ ; prosocial  $t(34) = .92, p = .36$ ; theory of mind  $t(40) = -.19, p = .85$ ; and age in months  $t(40) = -.27, p = .79$ . These insignificant results revealed that boys and girls did not differ from each other significantly, and so were combined as one group for the remaining analyses.

Table 1.

Means of the Variables of Interest for Males and Females

<u>Variables</u>	<u>Males</u>		<u>Females</u>	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Shyness	2.69	0.89	2.46	0.96
Sociability	3.64	0.68	3.74	0.58
Emotionality	2.77	0.77	2.81	0.91
Activity	3.75	0.94	3.82	0.64
Prosocial	17.62	3.34	18.86	5.19
ToM	4.86	1.68	4.76	1.58
Age	53.86	7.64	53.24	7.38

In order to test the hypothesis that more prosocial children perform better on theory of mind tasks than do less prosocial children, the correlations among the variables of interest, including age, theory of mind, prosocial behavior, activity, emotionality, sociability, shyness, and birth order were computed (Table 2). This hypothesis was not supported, as there was no significant relationship between theory of mind and prosocial behavior  $r = .06, p = .69$ . Further analyses revealed prosocial scores were strongly positively correlated with scores on the activity dimension of temperament  $r = .53, p < .01$ , such that children who were rated as more active were also rated as more prosocial than those children who were rated as less active. Prosocial scores were also negatively correlated with scores on the shyness dimension of temperament  $r = -.39, p = .01$ , such that children rated as more shy were also rated as less prosocial than those children who were rated as less shy. It was also found that theory of mind was correlated with age  $r = .32, p < .05$ , such that the older children performed significantly better on theory of mind tasks than did younger children. Theory of mind was negatively correlated with the emotionality dimension of temperament  $r = -.32, p < .05$ , such that those children who were rated as more emotional performed significantly worse on theory of mind tasks than those children who were rated as less emotional. Other relationships of interest showed no significant correlation, including theory of mind and sociability  $r = .03, p = .83$ . Birth order was found to have a marginally significant positive correlation to sociability,  $r = .27, p = .09$ , and to have a marginally significant negative correlation with prosocial behavior,  $r = -.27, p = .09$ , meaning that later-borns were more sociable but less prosocial than earlier-borns.



Table 2.

Pearson's *r* Analysis for Variables In Relation to Theory of Mind

<u>Measure</u>	1	2	3	4	5	6	7	8
1. Theory of Mind	1	.32**	.06	.03	-.32**	.03	-.098	.07
2. Age		1	.19	.18	-.03	-.08	-.15	-.23
3. Prosocial			1	.53***	-.06	.01	-.39***	-.27*
4. Activity				1	.025	.36**	-.57***	-.02
5. Emotionality					1	.09	.095	.09
6. Sociability						1	-.44**	.265*
7. Shyness							1	-.095
8. Birth Order								1

Note. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .  $N = 42$  for all correlations.

Because there was such a strong significant correlation between age and theory of mind, partial correlations were computed controlling for the age variable. When age was partialled out, the pattern of correlations did not change. The relationship between theory of mind and emotionality remained significant  $r = -.33$ ,  $p < .05$ . Additionally, the relationships between prosocial scores and activity, and between prosocial scores and shyness both remained significant  $r = .51$ ,  $p < .01$ , and  $r = -.38$ ,  $p = .015$ , respectively. All other relationships remained not significantly correlated (Table 3).

Table 3.

Partial Correlations Controlling for Age.

<u>Measure</u>	1	2	3	4	5	6
1. Theory of mind	1	.00	-.04	-.33*	.06	-.05
2. Prosocial		1	.51**	-.055	.02	-.38*
3. Activity			1	.03	.38*	-.55**
4. Emotionality				1	.09	.09
5. Sociability					1	-.46**
6. Shyness						1

Note: \*  $p < .05$ , \*\*  $p < .01$ .  $N = 42$  for all correlations

Lastly, a linear regression was conducted to predict scores on the prosocial questionnaire, using the variables of theory of mind, activity, age in months, and shyness as predictors. As Table 4 shows, these variables were shown to account for a significant amount of the variance,  $R^2 = .22$ ,  $F(4, 37) = 3.94$ ,  $p < .01$ . Only the variable of activity was found to predict the scores on the prosocial questionnaire,  $\beta = .43$ , such that more active children were rated as more prosocial than were less active children. The rest of the predictors were shown to be insignificant in predicting prosocial scores, and can be found in Table 4.

Table 4.

Summary of Linear Regression Analysis of Variables Thought to Predict Prosocial Scores.

Variable	B	SE B	$\beta$
Theory of Mind	.025	.395	.009
Age in Months	0.05	0.09	0.09
Activity	2.39	0.93	0.43*
Shyness	-0.63	0.79	-0.13

Note.  $R^2 = .22$  ( $p < .01$ ). \*  $p = .01$ .

### Discussion

The purpose of the current study was to examine the relationships among theory of mind, prosocial behavior, and temperament. The first hypothesis predicted that development of theory of mind ability would be positively related to engagement in prosocial behavior, such that children with more developed theory-of-mind abilities, and who therefore have a more complex ability to take the perspective of another, would engage in more prosocial behavior. The data did not support this hypothesis; results showed that the relationship between theory of mind and prosocial behavior was not significant. Results regarding the relationships between temperament and both theory of mind and prosocial behavior were mixed.

The lack of a significant relationship between theory of mind and prosocial behavior was unexpected, considering research supporting the idea that the development of theory of mind and the cognitive skills that it entails, such as understanding of others' mental states and how they dictate behavior, promote factors thought to be related to prosocial behavior. Ginsburg et. al. (2003) demonstrated that

children with more developed theories of mind are better able to distinguish between empathic and selfish motives of helping behavior. Furthermore, when given a chance to provide an empathic or selfish explanation for an action, children with more developed theories of mind would provide an empathic explanation. Therefore, one could suggest based on these findings that children with more developed theories of mind would engage in more empathic and prosocial behavior themselves within the preschool setting. Additional studies have shown that theory of mind is related to perspective-taking and empathy in children – factors related to prosocial behavior (Flavell & Miller; Zahn-Waxler, 1991), as well as to children's abilities to delay gratification and engage in future-oriented prosocial behavior to benefit another child (Moore et. al., 1998). For these reasons, the present findings were unexpected.

It could be the case that the development of theory of mind is not as important of a factor as researchers believe it to be; it is possible that there are other factors influencing prosocial behavior that are more salient than that of the development of theory of mind. Slaughter et. al. (2002) found that theory-of-mind ability was the best predictor of social preference scores for older children, meaning those who were over the age of five years, and their overall pattern of results suggested that the influence of theory-of-mind ability on peer acceptance is modest but increases with age. These findings align with those of Badenes et. al. (2000) who found that only in the older boys in their sample (those who were six years old) was theory of mind found to be related to making more antagonistic attributions about others' behavior, and to being classified as rejected from peer groups. These findings seem to suggest that differences in social-cognitive skills and capabilities such as theory of mind have a

stronger influence on peer acceptance as children develop. Since engagement in prosocial behavior is an important determinant of children's social status in their peer groups, it may also be the case that theory-of-mind abilities do not exert a significant influence on prosocial behavior until the later ages of five and six years old. The children in the current study's sample were mostly three- and four-year-olds, and a positive correlation was found between age and theory-of-mind ability, such that the older children in the sample had better-developed theories of mind. This finding is not surprising considering it has been found in many previous studies (Chandler et. al., 1989; Hala et. al., 1991). One would therefore expect that five- and six-year-olds would have even better developed theories of mind than three- and four-year-olds, and that the effect of theory of mind on prosocial behavior would become stronger in this older age group. It would therefore be beneficial to conduct the current study with an older age group, beginning with five-year-olds and extending into elementary-age children. Slaughter et. al. (2002) also suggest that there are a variety of factors that might mediate relations between theory of mind and peer acceptance, such as verbal ability and intelligence, so it would be beneficial to conduct a study investigating how these factors relate to the impact of theory of mind on prosocial behavior as well.

A second set of hypotheses predicted that theory of mind and prosocial behavior would be positively correlated with the temperament dimensions of sociability, and would correlate negatively with the dimensions of shyness and emotionality. Theory of mind was found to be negatively correlated with emotionality, such that more emotional children scored lower on theory-of-mind

ability, but theory of mind was not significantly correlated with shyness or sociability. It could be that more emotional children, who are more prone to feelings of anger and fear, have more volatile interpersonal interactions with peers, and find it more difficult to take the perspective of others, resulting in a less developed theory of mind. However, it is surprising that shyness and theory of mind were not found to be related, considering that shy children would be expected to have less well-developed theories of mind due to their inhibition in peer interactions. Perhaps peer interactions are not as important in the development of theory of mind as the hypothesis suggested.

Prosocial behavior was found to be significantly negatively correlated with shyness, such that more shy children tended to be less prosocial, but prosocial behavior was not significantly related to emotionality or to sociability. It is not surprising that children who are more shy tend to be less prosocial, as these more inhibited children are probably less likely than their more sociable peers to seek out interpersonal interactions, and therefore have less opportunity to initiate or engage in prosocial behaviors such as sharing or helping. However, it is surprising that prosocial behavior and sociability were not related, in light of the fact that sociability has been found to be related to children's willingness to help an unfamiliar stranger (Stanhope, Bell, & Parker-Cohen, 1987). It could also be posited that more social children engage in more interpersonal interactions, therefore gaining more experience in navigating relationships, and learning to behave more prosocially. However, this was not the case in the current study.

Interestingly, a significant positive correlation was found between prosocial behavior and the temperament dimension of activity, such that more active children were more prosocial. This finding was unexpected, but could be due to the fact that active children are always up and running around, engaging with others and seeking interaction. They therefore have plenty of opportunities to build interpersonal relationships and learn to engage in prosocial behavior such as helping and sharing in order to facilitate these relationships.

While some findings were unexpected, the results of the current study could have important implications. More emotional children were shown to perform more poorly on theory-of-mind tasks, a finding that is supported by previous research showing that children who display angry or negative emotions more often have lesser social cognitive abilities and prosocial responding (Denham, 1986). It is important to investigate this relationship further to understand why it is so. It is possible that these children have greater difficulty relating to others and taking their perspectives, and have more volatile social interactions, and it is important that parents and teachers find ways to accommodate these children to facilitate their social and cognitive growth. Peer relations are a crucial part of children's healthy social and cognitive development, therefore the findings on how certain temperament dimensions relate to prosocial behavior are important as well. It makes sense that more prosocial children would be better-liked by peers because of their willingness to help, comfort, and share, and therefore it is important to know what types of temperaments facilitate and inhibit this type of behavior. Based on the findings of the current study showing that shyness is negatively related to prosocial behavior while activity is positively related

to prosocial behavior, it would be wise for parents and teachers to take steps to encourage and help shy children in their interactions with peers, and to embrace the busyness of more active children. Temperament and social environments interact in complex ways to produce behavior (Xu, Zhu, & Chen, 2002), so it is important for preschool classrooms and home environments to adapt to children's temperaments in order to facilitate each child's unique needs and promote his or her social and cognitive development.

It is important to take into account various limitations when interpreting the findings of the current study. First, the current study involved a small sample size, with virtually no variation in parents' education levels and children's ethnic backgrounds. Therefore, the representativeness of the sample could be called into question. It was also impossible to determine whether children's theory of mind might vary with parents' varying education levels, something that could be explored in future studies. The positive correlation between birth order and sociability, and the negative correlation between birth order and prosocial behavior were marginally significant, and perhaps with a larger sample size these relationships would become clearer. Previous findings on the nature of birth order and temperament have been mixed, and depend largely on the types of temperament measures being used as well as the age group being studied (Beck, Burnet, Vosper, 2006; Kerestes, 2006; Howarth, 1982), but it would be interesting to investigate further birth order's role in prosocial behavior.

An additional limitation of the current study is that the two preschools studied were very similar. While one was larger than the other, both had similar populations



of preschoolers and parents. Because both schools had similar tuitions, parents' education levels were also very similar at the two schools, and it can be assumed that socio-economic statuses (SES) were quite high for all subjects. Therefore, it would be interesting to compare high- and low-SES populations, and how this might moderate development of theory of mind and prosocial behavior. Also, not all children in the current study spent an equal amount of time in the classroom; some only attended preschool a small number of days each week, and/or only went for half the day. This was not recorded in the current study, but it would be interesting for future studies to investigate whether the amount of time spent in the preschool setting has an effect on the development of theory of mind and prosocial behavior.

Another possible limitation of the current study is the type of measure used for prosocial behavior. The current study used a 10-item questionnaire adapted from Weir, Stevenson, and Graham's (1980) 20-item Prosocial Behavior Questionnaire for teachers. It could be the case that the adapted questionnaire used in the current study was not a reliable or sensitive enough measure of prosocial behavior. Alternatively, it could be that theory of mind is not significantly related to prosocial behavior, and that it is rather a more specific skill such as affective perspective-taking or emotional understanding that has a more salient and significant relationship to prosocial behavior. This positive significant relationship between affective perspective-taking and prosocial behavior has been shown in the literature (Denham, 1986), and some researchers have found that the prediction of social behavior is strengthened when emotional variables are examined (Strayer, 1980). Research has also indicated that affective perspective-taking and cognitive perspective-taking (such as that involved in

theory of mind) are significantly related, but that affective perspective-taking is more strongly related to prosocial behavior (Shantz, 1975). It seems that affective perspective-taking should be taken into greater consideration as its own unique cognitive construct with its own measure, and future studies could measure both affective perspective-taking and theory of mind to compare their effects on prosocial behavior.

A strength of the current study is that the three measures used – Buss and Plomin’s (1984) EAS Temperament Questionnaire; the adapted 10-item Prosocial Behavior Questionnaire based on Weir, Stevenson, and Graham’s (1980) original 20-item Prosocial Behavior Questionnaire for Teachers; and Wellman and Liu’s (2004) battery of seven theory of mind tasks – were assessed by different people. Parents completed the temperament questionnaires, teachers completed the prosocial behavior questionnaires, and the researcher administered the battery of theory of mind tasks. This eliminated the risk that arises when only one method, for instance, parents, are used to complete all of the questionnaires in a study – a risk that calls into question the possibility that correlations found between variables are due to the fact that the same method (parents) was used to measure each factor. This phenomenon is called shared method variance, but was not a concern in the current study thanks to the different methods used to measure each factor.

Overall, the goal of the current study was to investigate two things. The first was how the development of theory of mind was related to preschoolers’ engagement in prosocial behavior. The second was whether theory of mind and prosocial behavior were related to any of Buss and Plomin’s (1984) temperament dimensions. The main

hypothesis of the study was not supported. However, the data and results that were obtained were interesting and worthy of description and analysis, as temperament was found to be a better predictor of prosocial behavior than theory of mind. These results also warrant further study to clarify the nature of the relationship between theory of mind, temperament, and prosocial behavior, while taking into account other factors of interest such as affective perspective-taking, that were not addressed by the current study.

## References

- Anderson, M. (1986). Cultural concatenation of deceit and secrecy. In R. W. Mitchell & N. S. Thompson (Eds.), *Deception: Perspectives on human and non-human deceit* (pp. 323-348). Albany: State University of New York Press.
- Badenes, L. V., Estevan, R. A. C., & Bacete, F. J. G. (2000). Theory of mind and peer rejection at school. *Social Development, 9*, 271-283.
- Beck, E., Burnet, K. L., & Vosper, J. (2006). Birth-order effects on facets of extraversion. *Personality and Individual Differences, 40*, 953-959.
- Blair, K. A., Denham, S. A., Kochanoff, A., & Whipple, B. (2004). Playing it cool: Temperament, emotion regulation, and social behavior in preschoolers. *Journal of School Psychology, 42*, 419-443.
- Bukowski, W. M. & Newcomb, A. F. (1984). Stability and determinants of sociometric status and friendship choice: A longitudinal perspective. *Developmental Psychology, 20*, 941-952.
- Buss, A.H. (1991). The EAS theory of temperament. In J. Strelau & A. Angleitner (Eds.) *Explorations in temperament: International perspectives on theory and measurement* (pp. 43-60). New York: Plenum.
- Chandler, M.; Fritz, A.S.; and Hala, S. (1989). Small-scale deceit: Deception as a marker of two-, three-, and four-year-olds' early theories of mind. *Child Development, 60*, 1263-1277.

- Dekovic, M. & Gerris, J. R. M. (1994). Developmental analysis of social cognitive and behavioral differences between popular and rejected children. *Journal of Applied Developmental Psychology, 15*, 367-386.
- Denham, S. A. (1986). Social cognition, prosocial behavior, and emotion in preschoolers: Contextual validation. *Child Development, 57*, 194-201.
- Diener, M. L. & Kim, D. (2004). Maternal and child predictors of preschool children's social competence. *Journal of Applied Developmental Psychology, 25*, 3-24.
- DiLallo, L. F. (1998). Daycare, child, and family influences on preschoolers' social behaviors in a peer setting. *Child Study Journal, 28*, 223-244.
- Eisenberg-berg, N., & Hand, M. (1979). The relationship of preschoolers' reasoning about prosocial moral conflicts to prosocial behavior. *Child Development, 50*, 356-363.
- Eisenberg, N., Pasternack, J. F., Cameron, E., & Tryon, K. (1984). The relation of quantity and mode of prosocial behavior to moral cognitions and social style. *Child Development, 55*, 1479-1485.
- Eisenberg, N., Fabes, R. A., Bernzweig, J., Karbon, M., et. al. (1993). The relations of emotionality and regulation on preschoolers' social skills and sociometric status. *Child Development, 64*, 1418-1438.
- Eisenberg, N., Guthrie, I. K., Murphy, B. C., Shepard, S. A., Cumberland, A., & Carlo, G. (1999). Consistency and development of prosocial dispositions: A longitudinal study. *Child Development, 70*, 1360-1372.

- Eisenberg, N., Fabes, R. A., Guthrie, I. K., & Reiser, M. (2002). The role of emotionality and regulation in children's social competence and adjustment. In L. Pulkkinen & A. Caspi (Eds.), *Paths to successful development: Personality in the life course* (pp. 46-70). New York: Cambridge University Press.
- Farver, J. M. & Branstetter, W. H. (1994). Preschoolers' prosocial responses to their peers' distress. *Developmental Psychology*, *30*, 334-341.
- Flavell, J. H., & Miller, P. H. (1998). Social cognition. In Damon, W. (Ed.), *Handbook of child psychology: Volume 2: Cognition, perception, and language* (pp. 851-898). Hoboken, NJ: John Wiley and Sons Inc.
- Gilman, A. (2010). Amount of time in day care, temperament, and the development of theory of mind. Unpublished thesis, Union College, Schenectady, New York, USA.
- Ginsburg, H. J., Ogletree, S. M., Silakowski, T. D., Bartels, R. D., Burk, S. L., & Turner, G. M. (2003). Young children's theories of mind about empathetic and selfish motives. *Social Behavior and Personality*, *31*, 237-244.
- Hala, S., Chandler, M., & Fritz, A. (1991). Fledgling theories of mind: Deception as a marker of three-year-olds' understanding of false belief. *Child Development*, *62*, 83-97.
- Hay, D. F., Caplan, M., Castle, J., & Stimson, C. A. (1991). Does sharing become increasingly 'rational' in the second year of life? *Developmental Psychology*, *27*, 987-993.

- Hay, D. F., Payne, A., & Chadwick, A. (2004). Peer relations in childhood. *Journal of Child Psychology and Psychiatry*, *45*, 84-108.
- Howarth, E. (1982). Birth order and personality: Some empirical findings and a biobehavioral theory. *Personality and Individual Differences*, *3*, 205-210.
- Kerestes, G. (2006). Birth order and maternal ratings of infant temperament. *Studia Psychologica*, *48*, 95-106.
- Kochanska, G. (1997). Multiple pathways to conscience for children with different temperaments: From toddlerhood to age 5. *Developmental Psychology*, *33*, 228-240.
- Ladd, G. W. (1990). Having friends, keeping friends, and being liked by peers in the classroom: Predictors of children's early school adjustment? *Child Development*, *61*, 1081-1100.
- Leslie, Alan M. (1988). Some implications of pretense for mechanisms underlying the child's theory of mind. In J. W. Astington (Ed.); P. L. Harris (Ed.); D. R. Olson (Ed.), *Developing theories of mind* (pp. 19-46). New York: Cambridge University Press.
- Moore, C., Barresi, J., & Thompson, C. (1998). The Cognitive basis of future-oriented prosocial behavior. *Social Development*, *7*, 198-218.
- Nelson, B., Martin, R. P., Hodge, S., Havill, V., & Kamphaus, R. (1999). Modeling the prediction of elementary school adjustment from preschool temperament. *Personality and Individual Differences*, *26*, 687-700.

- Peterson, C. C., & Siegel, M. (2002). Misreading and moral awareness in popular and rejected preschoolers. *British Journal of Developmental Psychology, 20*, 205-224.
- Premack, D. & Woodruff, G. (1978). Does the chimpanzee have a 'theory of mind'? *Behavioral and Brain Sciences, 4*, 515-526.
- Robinson, J. L., Zahn-Waxler, C., & Emde, R. N. (1994). Patterns of development in early empathic behavior: Environmental and child constitutional influences. *Social Development, 3*, 125-145.
- Ronald, A., Happé, F., Hughes, C., & Plomin, R. (2005). Nice and nasty theory of mind in preschool children: Nature and nurture. *Social Development, 14*, 664-684.
- Rose-Krasnor, L. (1997). The nature of social competence: A theoretical overview. *Social Development, 6*, 111-135.
- Rothbart, M. K., & Bates, J. E. (1998). Temperament. In: Damon, W. & Eisenberg, N. (Eds.), *Handbook of child psychology, 5<sup>th</sup> ed.: Vol. 3. Social, emotional, and personality development* (pp. 105-176). Hoboken, NJ: John Wiley & Sons Inc.
- Schwartz, D., Dodge, K. A., Coie, J. D., Hubbard, J. A., Cillessen, A. H. N., Lemerise, E. A., & Bateman, H. (1998). Social-cognitive and behavioral correlates of aggression and victimization in boys' play groups. *Journal of Abnormal Child Psychology, 26*, 431-440.



- Shantz, C. U. (1975). The development of social cognition. In E. M. Hetherington (Ed.), *Review of child development research* (Vol. 5, pp. 257-324). Chicago: University of Chicago Press.
- Simner, M. L. (1971). Newborn's response to the cries of another infant. *Developmental Psychology, 5*, 136-150.
- Stanhope, L., Bell, R. Q., & Parker-Cohen, N. Y. (1987). Temperament and helping behavior in preschool children. *Developmental Psychology, 23*, 347-353.
- Stempler, E. (2009). Self-Monitoring and Theory of Mind in Three-, Four-, and Five-Year-Olds. Unpublished thesis, Union College, Schenectady, New York, USA.
- Strayer, J. (1980). A naturalistic study of empathic behaviors and their relation to affective states and perspective-taking skills in preschool children. *Child Development, 51*, 815-822.
- Thompson, C., Barresi, J., & Moore, C. (1997). The development of future-oriented prudence and altruism in preschoolers. *Cognitive Development, 12*, 199-212.
- Tremblay, R. E., Vitaro, F., & Gagnon, C. (1992). A prosocial scale for the preschool behavior questionnaire: Concurrent and predictive correlates. *International Journal of Behavioral Development, 15*, 227-245.
- Wellman, Henry M. (1988). First steps in the child's theorizing about the mind. In J. W. Astington (Ed.); P. L. Harris (Ed.); D. R. Olson (Ed.), *Developing theories of mind* (pp. 64-92). New York: Cambridge University Press.

- Wellman, H. M. & Liu, D. Scaling of theory-of-mind tasks. *Child Development*, 75, 523-541.
- Wimmer, H. & Perner, J. (1983). Beliefs about beliefs—representation and constraining function of wrong beliefs in young children's understanding of deception. *Cognition*, 13, 103–128.
- Xu, W., Zhu, Y., & Chen, L. (2002). Family environment and temperament of preschool children. *Chinese Mental Health Journal*, 16, 414-416.
- Zahn-Waxler, C., Friedman, S. L., & Cummings, E. M. (1983). Children's emotions and behaviors in response to infants' cries. *Child Development*, 54, 1522-1528.
- Zahn-Waxler, C. (1991). The case for empathy: A developmental perspective. *Psychological Inquiry*, 2, 155-158.
- Zahn-Waxler, C., Radke-Yarrow, M., Wagner, E., & Chapman, M. (1992). Development of concern for others. *Developmental Psychology*, 28, 126-136.

## Appendix A

Dear Parent/Guardian,

My name is Shannon Funkhouser, and I am a psychology student at Union College in Schenectady, NY. I am currently conducting my senior honor's thesis, and I would like to invite you and your child to be part of my project. I am exploring how young children's development affects their ability to understand the mental states of others. For instance, does the child understand that another person may have beliefs or knowledge that differ from his/her own beliefs or knowledge? I believe that the development of this ability to understand mental states may be related to the child's behavior within the preschool setting, specifically the child's social behavior. If your child takes part in the project, I will ask him/her to watch some stories that I will act out with little figurines. I will then ask your child a few questions, such as "Where will John think the candy bar is?" Or "Janet really likes cookies...Which snack will Janet choose?" Completion of the tasks should take about 15 minutes in total. I would like to stress that participation in this project is completely voluntary, and if your child does not want to participate, or to finish all of the tasks, then that will be fine. Most children, however, do find the tasks to be a fun interactive activity. Additionally, I ask for your permission to allow your child's teacher to fill out a brief questionnaire describing your child's typical sharing and helping behavior in the classroom.

I need to obtain your written permission before your child can participate. I would appreciate it if you could fill out the attached permission slip, as well as the brief demographic and temperament questionnaires about your child, and return them to your child's teacher as soon as possible. I would like to assure you that all answers will be kept confidential, and that no names will be used in my thesis.

Please return the attached information to your child's teacher, with whom I will be in contact regarding which children have permission to take part in my project. You can contact me at any time at [funkhous@garnet.union.edu](mailto:funkhous@garnet.union.edu), or my professor Linda Stanhope at [stanhopl@union.edu](mailto:stanhopl@union.edu). We are more than happy to provide further information, and to answer any questions that you may have. Additionally, if

you would like to receive a brief summary of my findings in the spring, please indicate that on the permission slip, and I will be happy to send them to an e-mail address or other contact of your choosing. Thank you so much for your time and consideration!

Sincerely,

Shannon Funkhouser

**Appendix B**  
Permission Slip

I, \_\_\_\_\_, give my son/daughter \_\_\_\_\_ permission to participate in Shannon Funkhouser's project exploring children's understanding of mental states, and also give my child's teacher participation to fill out a brief questionnaire describing my child's social behavior. I understand that my child and I will be free to withdraw participation from this project at any time, and that all answers and information will be kept confidential.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

If you would like to receive a summary of my findings when the project is complete in the spring, please check here \_\_\_\_\_.

Preferred e-mail address: \_\_\_\_\_

Thank you for your participation!

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**Appendix C**  
Demographic Information

Sex of child (Please circle one):      Male      Female

Which of the following best describes your child's ethnic background?:

Hispanic/Latino

American Indian or Alaska Native

Asian

Black or African American

Native Hawaiian or other Pacific Islander

White

Other (Please specify): \_\_\_\_\_

Child's Birth date: \_\_\_\_\_

Age of child: \_\_\_\_\_

Child's Birth Order:

only child

first-born

second-born

third-born

fourth-born

other (please specify): \_\_\_\_\_

With whom does the child typically reside? (Please circle all that apply):

Mother

Father

Stepmother

Stepfather

Grandmother

Grandfather

Other (Please specify): \_\_\_\_\_

What is the highest level of education attained by the child's parents/guardians?:

Parent/Guardian 1:

Some high school

High school diploma

Some college

2-year college degree

4-year college degree

Master's degree

MD/JD/PhD/Post Doctoral

Parent/Guardian 2 (If applicable):

Some high school

High school diploma

Some college

2-year college degree

4-year college degree

Master's degree

MD/JD/PhD/Post Doctoral

## Appendix D

Data sheets are the same as those used by Stempler (2009) and Gilman (2010)

TASK DATA SHEET Order:

Participant ID #: \_\_\_\_\_

	<b>Score:</b>	
<b>1. Diverse Desires:</b>		
<i>Own-Desires Question:</i> _____		
<i>Target Question:</i> _____	<b>0</b>	<b>1</b>
<b>2. Diverse Beliefs:</b>		
<i>Own-Belief Question:</i> _____		
<i>Target Question:</i> _____	<b>0</b>	<b>1</b>
<b>3. Belief-Emotion:</b>		
<i>Target Question:</i> _____		
<i>Emotion-Control Question:</i> _____	<b>0</b>	<b>1</b>
<b>4. Explicit False Belief:</b>		
<i>Target Question:</i> _____		
<i>Reality Question:</i> _____	<b>0</b>	<b>1</b>
<b>5. Contents False Belief:</b>		
<i>Target Question:</i> _____		
<i>Memory Question:</i> _____	<b>0</b>	<b>1</b>
<b>6. Knowledge Access:</b>		
<i>Target Question:</i> _____		
<i>Memory Question:</i> _____	<b>0</b>	<b>1</b>
<b>7. Real-Apparent Emotion:</b>		
<i>Target-Feel Question:</i> _____		
<i>Target-Look Question:</i> _____	<b>0</b>	<b>1</b>

**Total Score:** \_\_\_\_\_



## Appendix E

All tasks were taken directly from Wellman and Liu (2004; 538-539):

### *Diverse Desires*

Children see a toy figure of an adult and a sheet of paper with a carrot and a cookie drawn on it. “Here’s Mr. Jones. It’s snack time, so, Mr. Jones wants a snack to eat. Here are two different snacks: a carrot and a cookie. Which snack would you like best? Would you like a carrot or a cookie best?” This is the own-desire question. If the child chooses the carrot: “Well, that’s a good choice, but Mr. Jones really likes cookies. He doesn’t like carrots. What he likes best are cookies.” (Or, if the child chooses the cookie, he or she is told Mr. Jones likes carrots.) Then the child is asked the target question: “So, now it’s time to eat. Mr. Jones can only choose one snack, just one. Which snack will Mr. Jones choose? A carrot or a cookie?” To be scored as correct, or to pass this task, the child must answer the target question opposite from his or her answer to the own-desire question. This task was derived from those used by Wellman and Woolley (1990) and Repacholi and Gopnik (1997).

### *Diverse Beliefs*

Children see a toy figure of a girl and a sheet of paper with bushes and a garage drawn on it. “Here’s Linda. Linda wants to find her cat. Her cat might be hiding in the bushes or it might be hiding in the garage. Where do you think the cat is? In the bushes or in the garage?” This is the own-belief question. If the child chooses the bushes: “Well, that’s a good idea, but Linda thinks her cat is in the garage. She thinks her cat is in the garage.” (Or, if the child chooses the garage, he or she is told Linda thinks her cat is in the bushes.) Then the child is asked the target question: “So where will Linda look for her cat? In the bushes or in the garage?” To be correct the child must answer the target question opposite from his or her answer to the own-belief question. This task was derived from those used by Wellman and Bartsch (1989) and Wellman et al. (1996).

### *Knowledge Access*

Children see a nondescript plastic box with a drawer containing a small plastic toy dog inside the closed drawer. “Here’s a drawer. What do you think is inside the drawer?” (The child can give any answer he or she likes or indicate that he or she does not know). Next, the drawer is opened and the child is shown the content of the drawer: “Let’s see - it’s really a dog inside!” Close the drawer: “Okay, what is in the drawer?” Then a toy figure of a girl is produced: “Polly has never ever seen inside this drawer. Now here comes Polly. So, does Polly know what is in the drawer? (the target question) “Did Polly see inside this drawer?” (the memory question). To be correct the child must answer the target question “no” and answer the memory control question “no.” This task was derived from those used by Pratt and Bryant (1990) and Pillow (1989), although it was modified so that the format was more parallel to the contents False-Belief task.

### *Contents False Belief*

The child sees a clearly identifiable Band-Aid box with a plastic toy pig inside the closed Band-Aid box. “Here’s a Band-Aid box. What do you think is inside the Band-Aid box?” Next, the Band-Aid box is opened: “Let’s see - it’s really a pig inside!” The Band-Aid box is closed: “Okay, what is in the Band- Aid box?” Then a toy figure of a boy is produced: “Peter has never ever seen inside this Band-Aid box. Now here comes Peter. So, what does Peter think is in the box? Band-Aids or a pig? (the target question) “Did Peter see inside this box?” (the memory question). To be correct the child must answer the target question “Band-Aids” and answer the memory question “no.” This task was derived from one used initially by Perner, Leekam, and Wimmer (1987) and widely modified and used since then (see Wellman et al., 2001).

### *Explicit False Belief*

Children see a toy figure of a boy and a sheet of paper with a backpack and a closet drawn on it. “Here’s Scott. Scott wants to find his mittens. His mittens might be in his backpack or they might be in the closet. Really, Scott’s mittens are in his backpack. But Scott thinks his mittens are in the closet.” “So, where will Scott look for his mittens? In his backpack or in the closet?” (the target question) “Where are Scott’s mittens really? In his backpack or in the closet?” (the reality question). To be correct the child must answer the target question “closet” and answer the reality question “backpack.” This task was derived from one used by Wellman and Bartsch (1989) and Siegal and Beattie (1991).

### *Belief – Emotion*

Children see a toy figure of a boy and a clearly identifiable individual-size Cheerios box with rocks inside the closed box. “Here is a Cheerios box and here is Teddy. What do you think is inside the Cheerios box?” (Cheerios) Then the adult makes Teddy speak: “Teddy says, ‘Oh good, because I love Cheerios. Cheerios are my favorite snack. Now I’ll go play.’” Teddy is then put away and out of sight. Next, the Cheerios box is opened and the contents are shown to the child: “Let’s see - there are really rocks inside and no Cheerios! There’s nothing but rocks.” The Cheerios box is closed: “Okay, what is Teddy’s favorite snack?” (Cheerios). Then Teddy comes back: “Teddy has never ever seen inside this box. Now here comes Teddy. Teddy’s back and it’s snack time. Let’s give Teddy this box. So, how does Teddy feel when he gets this box? Happy or sad?” (the target question) The adult opens the Cheerios box and lets the toy figure look inside: “How does Teddy feel after he looks inside the box? Happy or sad?” (the emotion control question). To be correct, the child must answer the target question “happy” and answer the emotion-control question “sad.” This task was derived from one used by Harris, Johnson, Hutton, Andrews, and Cooke (1989).

### *Real – Apparent Emotion*

Initially, children see a sheet of paper with three faces drawn on it - a happy, a neutral, and a sad face - to check that the child knows these emotional expressions. Then that paper is put aside, and the task begins with the child being shown a cardboard cutout figure of a boy drawn from the back so that the boy’s facial

expression cannot be seen. “This story is about a boy. I’m going to ask you about how the boy really feels inside and how he looks on his face. He might really feel one way inside but look a different way on his face. Or, he might really feel the same way inside as he looks on his face. I want you to tell me how he really feels inside and how he looks on his face.”

“This story is about Matt. Matt’s friends were playing together and telling jokes. One of the older children, Rosie, told a mean joke about Matt and everyone laughed. Everyone thought it was very funny, but not Matt. But, Matt didn’t want the other children to see how he felt about the joke, because they would call him a baby. So, Matt tried to hide how he felt.” Then the child gets two memory checks: “What did the other children do when Rosie told a mean joke about Matt?” (Laughed or thought it was funny.) “In the story, what would the other children do if they knew how Matt felt?” (Call Matt a baby or tease him). Pointing to the three emotion pictures: “So, how did Matt really feel, when everyone laughed? Did he feel happy, sad, or okay?” (the target-feel question). “How did Matt try to look on his face, when everyone laughed? Did he look happy, sad, or okay? (the target-look question). To be correct the child’s answer to the target-feel question must be more negative than his or her answer to the target-look question (i.e., sad for target-feel and happy or okay for target-look, or okay for target-feel and happy for target-look). This task was derived from one used by Harris, Donnelly, Guz, and Pitt-Watson (1986).