

PAYMON, HOLLY, Ph.D. Parental Behaviors and Child Expressive Language Ability as Predictors of Peer Social Competence for Young Children With and Without Autism. (2019)

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Children with autism experience deficits in social and communication skills compared to their typically developing peers. Quality parental behaviors during dyadic interactions and children's expressive language ability could be important predictors of peer social competence during early childhood, especially for children with autism. This study examines the relations between parental behaviors, child expressive language ability, and peer social competence for children with autism spectrum disorder (ASD) and a comparison group of typically developing (TD) children. Secondary data from the Early Childhood Longitudinal Study—Birth Cohort (ECLS-B), a nationally representative longitudinal study following a sample of children born in the U.S. in 2001 from birth through kindergarten entry, were analyzed. Two subgroups of young children with and without a parent-reported diagnosis of autism were analyzed to understand the relative importance of parental behaviors and child expressive language ability in explaining peer social competence in kindergarten. Parental sensitivity, parental emotional supportiveness, and parental stimulation of cognitive development were hypothesized to particularly increase peer social competence for children with autism, relative to typically developing children. Additionally, it was hypothesized that parental intrusiveness, may have a lower negative impact, or possibly even a positive impact, on peer social competence, when autism is present, relative to typically developing children. Parent and child behaviors were examined using a dyadic and interactive Two Bags Task.

Child expressive language ability was measured using parent reports of children's expressive vocabulary usage. Peer social competence was measured from teacher responses to five items from the Preschool and Kindergarten Learning Behavior Scales—Second Edition (PKBS-2). Results showed between- and within-group differences across time for ASD and TD groups. Children with autism demonstrated lower peer social competence in kindergarten, compared to their typically developing peers. Main effects were found for child expressive language ability and parental intrusiveness on peer social competence in kindergarten. Specifically, child expressive language ability (at both waves 2 and 3) was positively associated with peer social competence such that higher levels of child expressive language ability were associated with greater peer competence in kindergarten. Parental intrusiveness (at both waves) was negatively associated with peer social competence, such that higher parental intrusiveness was associated with less peer social competence in kindergarten. Positive interaction effects were also found for autism and parental stimulation of cognitive development (at wave 3) as well as autism and child expressive language ability (at both waves) on peer social competence in kindergarten. Thus, for children with autism, parental stimulation of cognitive development (at wave 3) and child expressive language ability (at both waves) had stronger positive impacts on peer social competence in kindergarten, relative to typically developing children. Results of the present study are discussed in terms of potential interventions for improving the quality of parent-child interactions and the importance of fostering language and peer social competence during early childhood for children with autism.

PARENTAL BEHAVIORS AND CHILD EXPRESSIVE LANGUAGE ABILITY AS  
PREDICTORS OF PEER SOCIAL COMPETENCE FOR YOUNG  
CHILDREN WITH AND WITHOUT AUTISM

by

Holly Paymon

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## CHAPTER I

### INTRODUCTION

Children with autism demonstrate deficits in social-emotional reciprocity, nonverbal communicative behaviors, and developing, maintaining, and understanding relationships (APA, 2013). Because of the heterogeneity in the symptom presentation of autism characteristics, these deficits may look different for different children. Typically, symptoms of autism are noticed during the second year of life. While there have been studies that have looked at home videos of children who were later diagnosed with autism, and reported abnormalities within the first year of life (e.g., Zwaigenbaum et al., 2005), it is also possible for children to develop within normative ranges during the first year and then experience a slower acquisition of skills and plateaus or regressions in skills learned (Landa, Holman, & Garrett-Mayer, 2007). Interestingly, Carr and Lord (2009) noted that for children with autism who were developing normally and then experienced a loss of skills, their language losses may eventually be relearned, but the deficits in social reciprocity tend to persist. Thus, understanding factors that influence the development and maintenance of peer social competence will be particularly important for children with autism.

#### **Autism and Socioemotional Development**

There are many behavioral markers that distinguish toddler and preschool children with autism from typically developing children. The most notable differences are

their decreased interest in other people and decreased motivation for social exchanges (Landa et al., 2007). During the second year of life, toddlers with autism spend less time looking at others' faces and orienting to social stimuli (Osterling et al., 2002; Dawson, 2008), they demonstrate impairments in facial processing (Dawson, 2008) and difficulties in social reciprocity, including turn-taking and recognition and interpretation of affective expressions and mental states of others. Additionally, children with autism display deficits in joint attention, responsivity to social bids, social initiations, and use of gestures for communication (Landa et al., 2007). They exhibit atypical eye contact and social smiling (Zwaigenbaum et al., 2005), atypicality in their exploration of objects and in their object play (Williams, 2003), and have lower levels of expressive and receptive language skills (Mitchell et al., 2006; Zwaigenbaum et al., 2005). In general, children with autism demonstrate restricted attitudes toward shared experiences (e.g., limited social referencing and diminished awareness of others' interests in them) as well as difficulties identifying with others emotionally (e.g., empathy) and cognitively (e.g., theory of mind) (Hobson, Chidambi, Lee & Meyer, 2006).

The social motivation hypothesis states that because children with autism are less socially motivated, they engage in fewer interactions and devote less attention to social stimuli (Dawson, 2008). This may result in less exposure to novel words and fewer opportunities to observe others in their daily routines or using various objects, thereby restricting their ability to appropriately engage in functional play and later, pretend play (Mastrangelo, 2009). Children with autism also often demonstrate an increased focus of attention on objects (Dawson & Lewy, 1989; Zwaigenbaum, 2005) or parts of objects,

which sets them apart from their typically developing peers in terms of play interests. It should be noted that social skills are not absent for children with autism, just simply weaker than for typically developing children, thus supporting the need for research to focus on characteristics and experiences that can help augment peer social competence for children with autism. This study examines how parental behaviors may enhance children's emerging social skills via dyadic play interactions during the toddler and preschool years. This early childhood period is a time when parents are likely preparing children for the increased social and academic demands (e.g., forming and maintaining friendships with others, meeting teacher expectations in the classroom) of formal schooling, both through their own interactions with children and also by facilitating and guiding play dates with peers (Bullock, 1989).

### **Theoretical Importance of Play as a Context for Children's Skill Acquisition**

Play is a natural phenomenon that emerges in infancy and progresses through increasingly complex stages corresponding to the maturing developmental level of the child. Play offers a venue through which children can explore and learn about the social and physical world around them (Ginsburg, 2007). Caregivers are often the initial play partners for children in early childhood (Whaley, 1990) and have an important role in shaping how children interact with and learn from others in social situations. As children grow older, peers will become increasingly important play partners (Harris, 2015), if children have the social skills to be able to access this learning opportunity. Though a unified definition of play does not exist, many theorists and researchers have introduced taxonomies of play behaviors to describe the development of play. Much of the current

research uses the contributions of Piaget and Vygotsky as a framework for thinking about children's play behaviors. Piaget (1951) categorized three types of play (sensorimotor play, symbolic play, and play involving cognitive representation) in which each preceding stage overlaps with the next to represent continuous development. The first stage, sensorimotor play, involves tactile explorations of the child's environment and imitations of caregiver actions. The second stage, symbolic play, incorporates creativity, imagination, and make-believe or pretend play. The third category of play is the most sophisticated and involves engagement in games that require rules and strategy. Smilansky (1968) later expanded on Piaget's work and identified the category of sociodramatic play, which is a more complex type of pretend play that involves a social component (i.e., at least one other participant) and the use of more language skills throughout the pretend play experience.

Vygotsky's work centered on the idea that social relationships scaffold learning. Vygotsky introduced the zone of proximal development, which he defines as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 33). Modifications of the complexity of their interactions and behaviors during social play suggest that parents have an understanding of their children's developmental levels (O'Reilly & Bornstein, 1993). Additionally, the nature of this dyadic play relationship evolves through a natural course, consistent with the child's age and acquisition of additional capabilities (Crawley & Sherrod, 1984). Especially during the toddlerhood

through preschool years, parents, peers, teachers, relatives, etc. can scaffold learning for young children through the medium of play. These individuals have the ability to guide and enhance learning by providing the appropriate assistance that will enable children to solve tasks or engage in abstract manners of thought that they may not be able to do alone.

The experience of play in early childhood is the conduit through which many developmental gains are achieved, including cognitive, social, emotional, and linguistic advancements (Blasi, Hurwitz & Hurwitz, 2002; Goldstein, 2012). Though various types of play have a myriad of implications for the advancement of skills across developmental domains, one of the most fundamental benefits of play is that it provides a foundation for learning experiences (White, 2012). Play helps foster creativity and imagination, often seen in pretend play, social skills (e.g., turn taking and sharing), cognitive growth, flexible thinking, problem-solving, language comprehension and expression, and theory of mind (Goldstein, 2012; White, 2012; Burriss & Tsao, 2002; Isenberg & Quisenberry, 1988). Research has shown positive implications of pretend play on the development of school readiness skills. For example, a study by Morrissey and Brown (2009) found that greater engagement in pretend play during toddlerhood was indicative of greater IQ scores at age five.

Children diagnosed with autism demonstrate significant difficulties with play, characterized by restricted or atypical patterns of play (Freeman & Kasari, 2013). Children with autism are less likely to participate in social games (Williams, 2003), such as hide-and-seek or chasing games, are less likely to engage in behaviors that would elicit

social responses from others (Williams, 2003), such as acting silly, and are less likely to engage in acts of pretend play (Strid, Heimann, and Tjus, 2013). During play interactions with others, children with autism tend to spend more time unengaged with the other player and/or more interested in object play (Patterson, Elder, Gulsrud, and Kasari, 2014). Freeman & Kasari (2013) found that when play is centered around an object, children with autism demonstrate difficulty balancing attention to the object and managing social exchanges with the parent. Children with autism are also less likely to imitate another's actions with objects and may engage in more self-stimulatory behaviors with the objects (Zwaigenbaum et al., 2005). The social deficits and rigidity in behaviors exhibited by children with autism are evident in their play and can impede the developmental trajectory of play skills and the emergence of peer social competence, especially if it interferes with the parent-child relationship. Play is a critical mechanism for children to acquire and utilize to support skill development across domains (Ginsburg, 2007), but social play, in particular, is challenging for children with autism (Anderson, Moore, Godfrey & Fletcher-Flinn, 2004; Jordan 2003). Such limitations in play are concerning because without appropriate interventions, these children may be set on a path that is not facilitative to the typical developmental gains attained through play experiences. Parenting behaviors, especially during play interactions in early childhood, are likely shaping an important foundation of skills for children to be able to access and learn from later peer play experiences. However, it is important to know more about this potential association for children with autism, so we can better inform early intervention practices and provide support that would help facilitate peer social competency.



## **Dimensions of Child and Parent Behaviors in the Context of Dyadic Play**

Tamis-LeMonda, Užgiris, and Bornstein (2002) distinguish between two main dimensions of parent-child play, each incorporating three stages of play development. Interpersonal play involves high intensity, dynamic, social interactions between the parent-child dyad, and is characterized by the sub-stages of face-to-face play, social games and routines (e.g., nursery songs with interactive hand/body movements, hide-and-seek), and physical play (e.g., tickling, swinging/spinning, rough-and-tumble play). Object play, on the other hand, involves a lesser degree of social reciprocity between the parent-child dyad and shifts the focus of the play interactions off of the individuals and on to an external object(s) of interest. Stages of object play include exploration (similar to Piaget's sensorimotor play), nonsymbolic play (e.g., discovering the functionality of various items), and symbolic play (e.g., imaginative and pretend play).

In research studies, parent-child interactions are typically examined within the context of play interactions, which allow researchers to capture various parent behaviors that contribute to the functionality of the dyadic exchanges. The quality of parent-child interactions serves a vital role in the advancement of a myriad of developmental gains for children. Children with autism demonstrate profound differences in the way that they experience the world around them and therefore require a different level of parent behaviors than would be expected for a typically developing child. Adaptive parent behaviors may be especially important for children with autism, given their social and communicative deficits. In a study with toddler and preschool-aged children (mean age = 33 months) with autism, Pierucci, Barber, Gilpin, Crisler, and Klinger (2015) found a

significant correlation between play with parents and other developmental skills such that as play skills improve, so do children's receptive language, expressive language, visual receptive, and fine motor skills.

The context of play for parents and children with autism differs from dyads with typically developing children because of the atypical characteristics the child with autism brings to the interaction, which influences how the parents may respond. Parents may get socialized into a schema of how to play with their children, not only from their own thoughts and beliefs on play, but from the feedback they are getting from their child. However, that feedback is atypical compared to what most parents of typically developing children receive. Therefore, it is likely contributing to the development of an altered schema for these dyadic interactions over time. Consequently, mutually enjoyable, reciprocal play interactions with shared attention between parents and their children with autism may be more difficult to achieve, given the child's social and communicative deficits (Freeman & Kasari, 2013), which may translate to shorter play interactions, less parental bids for communication, and fewer initiations of joint play. Additionally, children with autism may demonstrate language delays that could present another barrier for communication (Weismer et al., 2010), or contribute to maladaptive behaviors. Furthermore, there may be a discrepancy between the cognitive and play developmental levels for children with autism. Parental understanding of their child's ability level across domains is imperative for being able to appropriately scaffold play interactions within the child's zone of proximal development to best facilitate cognitive and social gains.

A central tenant of play is that it be voluntary and intrinsically motivating. Therefore, for a quality parent-child play interaction, it is imperative for parents to understand their child's developmental play level as well as to both be able to accurately and intuitively interpret their child's behavioral cues and modify their own behaviors to match their child's needs. This level of attunement and responsivity with one's child is typically termed parental sensitivity (Biringen & Robinson, 1991). The construct of parental sensitivity is generally characterized by qualities such as contingency to children's cues, emotional/affective support, engagement and joint attention with the child, and supportive language inputs (Landry, Smith, and Swank, 2006). The term sensitivity is often used interchangeably with responsivity (Shin, Park, Ryu, & Seomun, 2008) and synchrony, as many researchers may identify overlapping or conceptually related qualities of each construct. Increased parental sensitivity has been linked to better cognitive and social-emotional outcomes for typically developing children (Beckwith et al. 1999). There is a large literature that links consistent responsiveness with gains in social skills and cognitive development (Landry, Smith, Swank, Assel, and Vellet, 2001) as well as language outcomes (Hudson, Levickis, Down, Nicholls, and Wake, 2005 & Tamis-LeMonda, Bornstein, and Baumwell, 2001) for children. More responsive parents tend to demonstrate synchronous behaviors such as responding promptly and sensitively to their child's communicative bids. Conversely, parents demonstrating asynchronous responsivity may be more directive or controlling in their play interactions. Taken together with the ambiguity in child feedback and the increased stressors associated with parenting a child with autism (Davis & Carter, 2008), sensitivity may be more

challenging for parents of children with autism and, over time, may lead to the parent losing interest or motivation to engage in the play.

Children with autism clearly experience deficits in their social play skills, however, these deficits are not always recognized or understood by their parents early on. Additionally, these deficits are not always congruent with the child's development in other domains. Landa et al. (2007) reported that social and play behaviors demonstrated by children at 14 months of age were equivalent to what would be expected in 8-10 month old infants and that the magnitude of these deficits was unexpected given their mean early learning composite scores on the Mullen Scales of Early Learning. The early learning composite score is derived from the fine motor, visual receptive, receptive language and expressive language scores. This finding suggests a discrepancy in developmental level across domains for children with autism, which could be an added source of confusion, or maybe even unknown factor, for parents trying to play with their children in a developmentally appropriate way.

Freeman & Kasari (2013) evaluated parent-child interactions in structured and free play tasks with 16 typically developing children (mean age = 28.5 months, n = 9 boys) and 16 children with autism (mean age = 49.5 months, n = 12 boys) who were matched with respect to mental and linguistic age. The structured play assessment was with the examiner while the free play task was with the parents. Results indicated that when parents engaged their child within their zone of proximal development, they experienced longer periods of joint engagement during play. However, this was more difficult for parents of children with autism, compared to parents of typically developing

children, because they typically engaged their child in play interactions that exceeded their level of play skills. This suggests that parents of children with autism may have a more difficult time engaging in mutual play with their child because of the difficulty in reading their cues and understanding their behaviors with respect to their play skills, because parents may be generalizing the child's abilities across domains, or because parents may be relying on norms for typically developing, same-aged peers.

Freeman & Kasari (2013) also found that children with autism played more during the structured play task with an examiner, compared to the free play task with their parent. Given that children with autism can develop secure attachments to their caregiver and demonstrate a clear preference for their caregiver over others, despite their lower interest in social exchanges, this finding suggests that the structured experience of play is more motivating than unstructured play time. It may be that the balance between directiveness (e.g., presenting different toys) and allowing the child breaks from stimulation to explore toys/objects on their own, during the structured play task, is a motivating combination to sustain play. Similarly, it could be that young children with autism get overwhelmed by the sensory inputs (e.g., verbal, physical, emotional expressions, etc.) from caregiver involvement during unstructured play. Thus, mindfulness of the child's cues is important for moderating caregiver behaviors during play and potentially supporting advancements in other social behaviors.

Patterson, Elder, Gulsrud and Kasari (2014) examined the relation between directive and responsive parenting styles and child social behaviors, particularly joint engagement, in 85 toddlers with autism spectrum disorder (mean age = 31 months, n = 70

boys). Toddlers and their caregiver engaged in a 10-minute play interaction with provided toys. Researchers found a correlation between child-initiated play behaviors in the dyadic play interactions and increased child attention, affect, and use of nonverbal communicative behaviors, such as eye gaze and gestures as well as greater parental responsivity during those interactions. Parent initiated play behaviors, on the other hand, were correlated with greater compliance and persistence from the children. These findings corroborate the importance of a balance between allowing the child to seek out interactions from the parent and the parent driving the nature of the dyadic play interactions. Both circumstances may be beneficial for the child with autism. For example, it could be that contingent responsivity results in more social, emotional, or communicative gains while directiveness or intrusiveness results in more directly teachable moments and therefore, greater cognitive gains. Additionally, a balance of responsive approaches may impact the child's attention and shared engagement in activities. However, research has yet to test these ideas with children with autism, thus supporting the need for a study examining the parental attributions to the context of play.

### **Child Language and Parent-Child Interaction**

Language abilities in children with autism may be a significant factor contributing to the parent-child play interaction (Strid, Heimann, and Tjus, 2013). Kasari, Sigman, Mundy, and Yirmiya (1988) examined the relation between caregiver interactions and social and communicative behaviors of children with autism (n = 18; 4 girls, mean age = 53.28 months). Three groups of 18 children with autism, with an intellectual disability, and typically developing children, all matched in mental age, participated in a play

interaction with their caregiver. Researchers found that caregivers of children with autism and caregivers of children with intellectual disabilities attempted to elicit eye contact more often, used more physical prompts and spent greater amounts of time initiating activities compared to caregivers of typically developing children. Additionally, caregivers of children with autism demonstrated more positive feedback with their child, but also physically held their child on task for greater durations of time during the session, compared to caregivers of intellectually disabled and typically developing children. Within the sample of children with autism, there were negative relations between the amount of time caregivers spent trying to establish eye contact with children as well as the duration of time caregivers spent physically holding their child on task, with the child's nonverbal indicating skills (i.e., communicative attempts to establish joint attention with an object). There was also a negative relation between the time caregivers spent initiating an activity, with both the nonverbal indicating behaviors as well as the expressive language skills of children with autism. However, they found positive correlations between caregiver engagement in both mutual play and positive feedback with nonverbal indicating skills and expressive language skills of children. Stated another way, though the directionality of these influences is unclear, children who are better able to communicate also have caregivers who demonstrate more mutually enjoyable interactions (e.g., less regulatory behaviors and more mutual play with positive feedback). These findings corroborate the differential responding from caregivers as a result of their child's communicative abilities. It also supports that caregivers of children with autism tend to demonstrate more physically controlling behaviors, though the

purpose of such behaviors is unclear. Caregivers may be over-compensating for their child's deficits and feel like they must be more involved as a result. The physical prompts and holding may also simply be the parent's way of trying to engage in mutual activities with a child who is less interested in social interactions. Nonetheless, these parental behaviors appear to be working for children with autism as no significant differences in the duration of mutual play were observed in comparison to dyads with intellectually disabled and typically developing children.

Hudry et al. (2013) conducted a study with children with autism (n = 151; 14 girls, mean age = 44.8 months) and their parents interacting during a free play session. They found that child's language age-equivalent was a significant positive predictor of parent synchrony, child initiation, and shared attention. Additionally, nonverbal children with autism had parents that demonstrated less communicatively synchronous behaviors in free play interactions compared to parents of verbal children with autism. This finding could suggest that parents have a difficult time understanding their child's play behaviors when the child is unable to verbalize their wants, needs, or thought processes during play. These asynchronous behaviors may also reflect attempts to stimulate interest and engagement in play interactions (e.g., by trying to direct attention or elicit interactions by making an object or activity seem more enticing), especially given the decreased motivation for social exchanges in children with autism. Therefore, consistent with a transactional approach, a child's language ability could have bidirectional or reciprocal effects on parental behaviors during the dyadic play interaction.



## **Peer Social Competence**

Social competence is a developmental construct that looks different at various developmental stages. Definitions and measurements of social competence vary among researchers and studies (Vaughn et al., 2009). For example, Guralnick (1992) proposed a hierarchical model of factors leading to the development of peer social competence. Those factors first include social/communicative skills, which lay the foundation for the emergence of social tasks (i.e., social-cognitive skills and emotion regulation) and social strategies (Guralnick, 1992). Thus, higher order interpersonal capabilities are predicated on the successful functioning of more basic interactive skills, and likely strengthen over time with advancing developmental capabilities and increased exposure to more complex social situations. In the present study, peer social competence in kindergarten is characterized by more relational items that are developmentally appropriate in early childhood, including a child's acceptance by peers as well as a child's ability to make friends, share belongings, comfort others, and try to understand others.

## **Child Language Ability and Peer Social Competence**

Research has demonstrated a link between children's language/communication skills and peer play during the preschool years. For example, Mendez, Fantuzzo, and Cicchetti (2002) found that for preschool children, greater communicative abilities were associated with greater peer social competence. Additionally, Mendez and Fogle (2002) found that preschool children who demonstrated poor expressive language abilities were more disruptive, aggressive, and withdrawn during peer play. They also found a positive association between better peer play skills in preschool, as reported by parents, and

children with stronger receptive language abilities across 8 months. Taken together, these research studies suggest that children's language abilities may also have a bidirectional effect on peer social competence. Although these studies were not with autism samples, we know that children with autism are already approaching peer interactions with social (Jordan, 2003; Anderson et al., 2004) and communicative deficits (Smith, Goddard & Fluck, 2004). Therefore, examining other factors (e.g., parental behaviors during dyadic play interactions) that may contribute to peer social competence, will be especially important for children with autism.

### **Parent-Child Play Interactions and Peer Social Competence**

The social abilities necessary for children to access their peer group and engage in efficacious peer interactions during early childhood likely derive from or are influenced by early parent-child play interactions (Hebert-Myers et al., 2006; Putallaz, 1987; Denham, Renwick & Holt, 1991). Many research studies have identified links between qualities of early parent-child relationships and later social competence and peer acceptance (Putallaz & Heflin, 1990). For example, a study by Leve and Fagot (1997) found a significant positive relation, for boys only, between parental warmth and parental scaffolding in early childhood (18 months and 5 years of age) and positive peer interactions at 7 years of age. Additionally, Hebert-Myers et al., (2006) found that mother-child play during preschool had a positive impact on children's social connectedness with peers at age 8 years. Thus, parents who play well with their typically developing kids, generally have children with greater peer social competence. However, how parents play with their children may change over time. For example, it may be that

parents of younger children (e.g., toddlers) engage in more unstructured free-play activities, while parents of older children (e.g., preschool) begin to increase their activity with more of a focus on getting children ready for the social and academic demands they will face in kindergarten. The present study aims to examine if different types of parental behaviors during play with children with autism, at two time points – toddlerhood and preschool – also have a positive impact on peer social competence in kindergarten.

A diagnosis of autism can come at different points in early childhood and have varying impacts in terms of the child's symptoms and skills as well as the parent-child relationship. Parenting at earlier developmental periods (e.g., toddlerhood) may be more influential on later peer social competence, especially if dyads are engaging in more mutually enjoyable activities together. At the same time, parents of preschool children may be more intentional in their play as they begin to prepare children for kindergarten, thus providing a more cognitively stimulating environment. Either way, parents are likely building on previous skills, schemas, and interactions with their child (e.g., from earlier time points), even if the focus or the content of the play changes over time. However, parental behaviors closer to kindergarten entry, relative to toddlerhood, are also likely more impactful if parents are becoming more deliberate in their efforts to engage in stimulating activities and interactions, as children are advancing developmentally, that provide children with foundational skills for school. To explore these concepts further, this study looks at parent and child data when children were approximately two years old (Wave 2) and when children were around four years old (Wave 3; preschool) and

examines how the parental behaviors at each time point are associated with children's peer social competence in kindergarten.

### **Methodological Challenges in Studies of Parenting and Autism**

There are many unanswered questions about what parenting really looks like for children with autism. Some challenges for addressing these questions include the limited data sets with parent-child observations as well as the lack of longitudinal evidence about how children with autism develop. To help advance the field, studies need to begin to integrate what we know about parenting with children with autism and what we know more generally about parenting and play with samples of typically developing children. It is important to consider how parent attributes contribute to the play context and what impact this has on developmental gains for the child. Current literature is lacking in large scale longitudinal research with children with autism and typically developing children. The ECLS-B, however, is a nationally representative data set that includes data collected across five time points; 9-months (wave 1), 2 years (wave 2), 4 years/preschool (wave 3), and kindergarten entry (wave 4/wave 5; age 5 or 6 years). Furthermore, at wave 3, parents were asked whether their child had ever received a diagnosis of autism spectrum disorder or pervasive developmental disorder from a physician, thus allowing researchers to consider autism status in data analyses. Therefore, the ECLS-B currently represents the most feasible option for longitudinally studying parent-child interactions and developmental outcomes for children with autism.

## **Present Study**

The goal of the proposed study was to better understand how child and parental behaviors differ for children with autism and a comparison group of typically developing children. Specifically, this study sought to examine the relationship between parental behaviors, child expressive language ability, and their potential interaction, on children's peer social competence in kindergarten as well as how an autism diagnosis may moderate these relationships. Prior to examining the main research questions, I explored how parent-child interactions during an observational lab task may look different for dyads with and without autism. Based on the review of previous literature, several hypotheses were developed to address the following research questions:

**Research Question 1.** How do observed child and parental behaviors on the Two Bags Task differ between dyads with children with autism and typically developing children at and across wave 2 and wave 3?

It was hypothesized that none of the adaptive parent or child constructs on the Two Bags Task would favor dyads with children with autism (e.g., the means of the parental sensitivity, parental emotional supportiveness, parental positive regard, parental stimulation of cognitive development, child engagement of parent, child sustained attention, and child quality of play constructs would be lower while the means of the parental intrusiveness, parental negative regard, parental detachment, and child negativity toward parent constructs would be higher for the ASD subsample, relative to the TD subsample, at both waves). It was also hypothesized that child and parental behaviors on the Two Bags Task would improve (from wave 2 to wave 3) as children are nearing

formal schooling. Lastly, it was predicted that child expressive language abilities would be lower for children with autism, relative to typically developing children.

**Research Question 2.** What is the impact of parental behaviors on the Two Bags Task, child expressive language ability, and their possible interaction, at wave 2 and wave 3 on peer social competence at kindergarten? How does a diagnosis of autism moderate these relationships?

For this research question, age at kindergarten entry was accounted for as children develop language skills at different rates and it is likely that older children would have developed stronger language abilities than younger children. Additionally, income and child gender were also accounted for as previous research has shown that low-income males have lower social competence than females (Mendez, McDermott & Fantuzzo, 2002; Coolahan, Fantuzzo, Mendez & McDermott, 2000). Covarying out these variables allowed for a better understanding of the relationships among the study constructs.

It was hypothesized that parental sensitivity (wave 2) and parental emotional supportiveness (wave 3), both would have a positive relation to peer social competence in kindergarten. Additionally, these parental behaviors were predicted to particularly increase peer social competence for children with autism, relative to typically developing children. The idea was that if children with autism have regular exposure to sensitive and emotionally supportive parenting, then they have a model of positive exchanges and a developing schema for play interactions that they can draw upon during future interactions with peers. Similarly, it was hypothesized that parental stimulation of cognitive development (at both waves) would have a positive relation to peer social

competence in kindergarten. However, closer to kindergarten, it was predicted that parental stimulation of cognitive development would matter more because children are getting ready to go on to formal schooling and parents are likely increasing their activity. Thus, the wave 3, relative to wave 2, parent stimulation of cognitive development is hypothesized to be a better predictor of peer social competence in kindergarten. Additionally, parental stimulation of cognitive development (at both waves) was predicted to particularly increase peer social competence for children with autism, relative to typically developing children. The rationale being that if parents of children with autism are able to understand their child's developmental level and scaffold the play experience within the child's zone of proximal development, then there is something facilitative in these interactions that is going to contribute to the child's peer social competence.

Child expressive language abilities and parental behaviors likely have a bidirectional effect on one another (e.g., a child's impaired language skills may complicate parenting or parent interactions may facilitate language acquisition). Thus, a positive two-way interaction effect was predicted for the parental construct (parental sensitivity at wave 2, parental emotional supportiveness at wave 3, parental stimulation of cognitive development at wave 2 and at wave 3) and child expressive language ability (at the corresponding wave) on peer social competence in kindergarten. Furthermore, given the nature and symptom presentation of children with autism, a three-way (parental construct x child expressive language ability x autism) interaction was predicted such that the interaction of the parental construct and child expressive language ability was

hypothesized to have a stronger positive impact on peer social competence for children with autism, relative to typically developing children.

It was also hypothesized that parental intrusiveness (at both waves) would have a negative relation to peer social competence. However, it was predicted that parental intrusiveness may look and function differently for a dyad with a child with autism compared to a typically developing child. For example, a child with autism may ignore or turn away from the parent during play, which could either be interpreted as a regulatory behavior or as the child's efforts to communicate that he/she is not interested in engaging in that particular activity. Or, given the difficulty children with autism face in inferring intentions or emotional expressions, a parent's use of more directive or "intrusive" behaviors at times may be beneficial to help capture the child's attention and encourage joint play. Therefore, it was hypothesized that parental intrusiveness in play may have a lower negative impact, or possibly even a positive impact, on peer social competence in kindergarten, when autism is present, relative to typically developing children.



## **CHAPTER II**

### **METHODS**

#### **Data Source**

The ECLS-B is a nationally representative longitudinal study that followed approximately 10,700 children, born in the U.S. in 2001, from birth through kindergarten entry (Andreassen & Fletcher, 2007; Najarian et al., 2010). Data collection involved the use of observational data, direct assessments, parent interviews, and survey questionnaires taken across home, childcare, and school settings. Information was gathered on children's social, emotional, cognitive, and physical development at five time points; 9 months (wave 1), 2 years (wave 2), 4 years/preschool (wave 3), and kindergarten (waves 4 and 5; ages 5 and 6 years, respectively). Data from waves 2, 3, 4, and 5 were utilized in this study.

#### **Study Sample**

This study selected a sample of children from the ECLS-B that included a subsample of children diagnosed with autism spectrum disorder (ASD) and a comparison group of typically developing (TD) children. At each wave, on the parent interview, parents were asked a series of medical questions about their child. One question asked whether or not caregivers were informed by their doctor that the child had "autism or PDD" (Pervasive Developmental Disorder). The ASD group for this study was created by

including any child whose parent reported an “autism or PDD” diagnosis at any of the waves 3, 4, or 5. This question, specific to autism or PDD, was not asked at waves 1 or 2.

To select the typically developing sample, subjects with a non-ASD disability or medical condition and subjects with a significant disability in addition to ASD were removed (see Table 1 for exclusion criteria). Subjects with missing data on disability or medical conditions, or on the autism/PDD question for all three waves, were excluded from the study sample. Thus, the final study sample includes approximately 100 children with ASD and approximately 9200 TD children and their demographics, by sub-sample, are characterized in Table 2. Of note, some of the children were missing data at different waves, therefore the analytic sample size for children with autism was most often ~50, which may have limited the power to detect significant findings for more involved statistical analyses. Similarly, the analytic sample size for typically developing children changed (e.g., typically between ~3400-5300), depending on whether children had complete data for a given analysis (see tables for respective sample sizes). Both sub-groups demonstrate a diverse study sample in terms of race/ethnicity. Of note, the categories of the race/ethnicity variable were not mutually exclusive, resulting in percentages totaling over 100. In general, the autism sub-sample had a greater percentage of males (ASD = 82%, TD = 50%), higher mean income (ASD = \$35,001-\$50,000, TD = \$30,001-\$40,000), and comparable mean age at kindergarten (ASD = 69.15 months, TD = 68.66 months). All sample sizes have been rounded to the nearest 50, in accordance with the National Center for Education Statistics (NCES) confidentiality procedures. Additionally, NCES-computed sample weights have been applied to each of the analyses

to account for sampling design and so that they can reflect a national representation of the U.S. population of children born in 2001. Analyses that addressed Research Question 1 were conducted using the sampling weight (WK1C0), which is appropriate for parent-reported and direct assessment data. The descriptive statistics for the study sample, Pearson correlations, and predictive analyses of Research Question 2 were all conducted using the weight (WK45T0), which is appropriate for analyses that also involve teacher-reported data.

## **Measures**

**Parent-Child Interaction.** At wave 2 (2-year) and wave 3 (preschool), child and parental behaviors were measured using the Two Bags Task. The Two Bags Task is a modified version of the Three Bags Task, which is a semistructured 15-minute parent-child interaction, where the dyad is observed playing with the contents of three separate, numbered bags. These observations were videotaped and later scored by trained coders. The Two Bags Task was shortened to include a 10-minute interaction in which the dyad had to play with the contents of the two bags in numerical order. At wave 2 (2-year), the first bag contained a set of dishes and the second bag contained the picture book, *Good Night, Gorilla*, by P. Rathmann (1994). At wave 3 (preschool), the first bag contained the book *Corduroy*, by Don Freeman (1968) and the second bag contained Play-Doh, a rolling pin, and cookie cutters.

Administration and coding differences in the Two Bags Task between wave 2 and wave 3 were minimal (see Table 3) but required to ensure that the task remained developmentally appropriate. At wave 2, coders assigned independent scores to six parent

rating scales and three child rating scales. Two of the parent rating scales were highly correlated and merged into one scale for wave 3. Additionally, one of the child scales, “child sustained attention” was replaced by “child quality of play” at the preschool wave. Each construct was scored on a 7-point scale, ranging from 1 (very low) to 7 (very high).

*Parental constructs* (Andreassen & Fletcher, 2007; Najarian et al., 2010).

**Parental emotional supportiveness** reflects the degree to which parents demonstrate emotional and affective support during child-centered interactions. **Parental sensitivity** involves understanding and appropriately responding to child cues. **Parental stimulation of cognitive development** signifies the parent’s ability to teach skills that are at or slightly above the child’s developmental level and interest. **Parental intrusiveness** is seen from the perspective of the child and captures the level of control demonstrated by the parent as opposed to the engagement of child-led interactions. **Parental detachment** reflects the parent’s level of engagement and attention in the interactions with the child. **Parental positive regard** reflects the parent’s use of warmth and positive behaviors and expressions while **parental negative regard** is seen from the perspective of the child and reflects the parent’s use of negative behaviors or expressions. In the original study, the Cronbach’s alpha for the parent scales at wave 2 was 0.73 (Andreassen & Fletcher, 2007). This information was not computed for the child scales.

*Child constructs* (Andreassen & Fletcher, 2007; Najarian et al., 2010). **Child engagement of parent** ratings reflect the child’s level of initiating and maintaining interactions with the parent as well as demonstrating positive affect towards the parent. **Child sustained attention** reflects the child’s involvement and ability to focus on objects

during interactions. **Child quality of play** reflects the level of the child's attention, self-direction, and complexity of play. **Child negativity toward parent** captures the degree to which the child demonstrates negative affect or expressions towards the parent.

All constructs of the Two Bags Task were used in between-group descriptive analyses. However, only the constructs that do not change over time (i.e., parental stimulation of cognitive development, parental intrusiveness, parental positive regard, parental negative regard, parental detachment, child engagement of parent, and child negativity toward parent) were utilized in the within-group descriptive analyses. Additionally, the constructs of parental sensitivity, parental emotional supportiveness, parental stimulation of cognitive development, and parental intrusiveness were examined for their relation to children's peer social competence in kindergarten and were therefore, used in the regression analyses (see Data Analysis). While parental stimulation of cognitive development and parental intrusiveness are examined at both waves 2 and 3, regression analyses only included parental sensitivity at wave 2 and parental emotional supportiveness at wave 3, as these constructs were not available at wave 3 and wave 2, respectively, due to some of the constructs changing over time.

**Expressive Language.** Child expressive language ability was examined as a possible contributor to peer social competence. At both waves 2 and 3, parents reported on their child's expressive vocabulary use. Interviewers read from a 50-word list (wave 2) or a 25-word list (wave 3) that had been incorporated into the Parent CAPI Instrument and parents indicated whether or not their child could say each of the words. The list of words for each data collection wave was derived from the MacArthur Communicative

Development Inventory (M-CDI; Fenson et al., 1994). Because the list of words in the M-CDI was so long and would have been time consuming to administer during a home visit, one of the co-authors of the M-CDI was consulted and developed a shorter list of typical words that are known and used by two-year old children. Because the M-CDI was only designed to be used with children up to 30 months of age, the authors were again consulted to develop a new, short, developmentally appropriate vocabulary list (M-CDI-IV) to be used with children at the preschool wave. Vocabulary scores corresponded to the sum of the words a child was able to say. A variable was created that captured the mean of the vocabulary scores (i.e., the total number of words the child was able to say divided by the total number of words) and this mean score was used as a predictor variable in this study.

**Peer Social Competence.** At waves 4 and 5, teachers, parents, and early care and education providers (ECEP) completed surveys that contained socioemotional items derived from various instruments. Parents and ECEPs also provided this information at wave 3. However, to eliminate any biases from parent reports, and to account for the fact that some children may not have gone to preschool and/or some ECEPs could have been family members, the peer social competence data for this study came only from teacher reports. Peer-focused social competence items were examined, and a peer social competence outcome variable was created by summing five items to create a total score. The items and their corresponding Cronbach's alphas for waves 4 and 5 are reported in Table 4. Teachers rated the frequency of each of these behaviors, in the classroom, on a 5-point scale ranging from 1 (never) to 5 (very often). All five items were taken from the

Preschool and Kindergarten Learning and Behavior Scales—Second Edition (PKBS-2; Merrel, 2002). The teacher-reported peer social competence outcome variable corresponded to each child's first year in kindergarten. Data at waves 4 and 5 were examined and if any child had data for both waves (i.e., they repeated kindergarten), then data from their first year in kindergarten was utilized. The data at wave 5 was added for anyone who did not have wave 4 data.

### **Data Analysis**

Preliminary analysis involved computing Pearson correlations for all study variables and running descriptive statistics for the study sample. To address research question 1, the pattern of relations in the constructs of the Two Bags Task for waves 2 and 3 were examined for dyads with children with autism and typically developing children. T-tests were computed to determine the within-group mean differences between the scales of the Two Bags Task, across waves 2 and 3, as well as between-group differences across waves 2 and 3. Of note, all child and parental constructs of the Two Bags Task were utilized in between group analyses, but only the constructs that remained the same from wave 2 to wave 3 were examined in the within-group analyses. T-tests were used to examine mean differences between children's expressive language ability between groups of children with and without autism.

Multiple hierarchical linear regression analyses were run to test the predictive hypotheses of research question 2. The demographic covariates in each model include child gender, income, and age in kindergarten. The constructs of the Two Bags Task that are used in the regressions include parental sensitivity, parental emotional supportiveness,

parental stimulation of cognitive development, and parental intrusiveness. While parental stimulation of cognitive development and parental intrusiveness are examined at both waves 2 and 3, parental sensitivity was only examined at wave 2 and parental emotional supportiveness was only examined at wave 3, as these constructs were not available at wave 3 and wave 2, respectively, due to constructs changing over time. Parental positive and negative regard and parental detachment were only examined for descriptive purposes and thereafter were excluded from further analyses.

Hierarchical regression models that tested the main effects of the parental constructs (i.e., parental sensitivity, parental emotional supportiveness, parental stimulation of cognitive development and parental intrusiveness) on children's peer social competence in kindergarten as well as how a diagnosis of autism moderates that relationship, involved entering the covariates at step 1, autism status at step 2, the parental construct at step 3 (main effect), and the interaction term of the parental construct and autism at step 4 (interaction effect). These models were run separately for each of the four parental constructs and using data from both wave 2 and wave 3 for parental stimulation of cognitive development and parental intrusiveness, for a total of 6 regression models.

Two regression models (one for wave 2 and one for wave 3) tested the main effects of child expressive language ability on children's peer social competence in kindergarten as well as how a diagnosis of autism moderates that relationship. In these models, the covariates as well as autism status were entered in at step 1. Child expressive



language ability was entered in at step 2 (main effect). The interaction term of child expressive language ability and autism was entered in at step 3 (interaction effect).

Finally, the three-way interaction effects (parental construct x autism status x child expressive language ability) were examined. In these models, the covariates and autism status entered the model at step 1. The parental construct as well as child expressive language ability entered the model at step 2. The interaction term of the parental construct and child expressive language ability was entered at step 3. Lastly, the interaction terms for parental construct and autism, child expressive language ability and autism, and the three-way interaction term (parental construct x autism x child expressive language ability) were entered at step 4. These models were run separately for each of the four parental constructs and using data from both wave 2 and wave 3 for parental stimulation of cognitive development and parental intrusiveness, yielding a total of 6 additional regression models.

## CHAPTER III

### RESULTS

Correlations among the covariates (child gender, income, and child's age in kindergarten) and the outcome variable (peer social competence in kindergarten) are reported in Table 5. Child gender ( $r = -.20$ ; coded 1 for boys), income ( $r = .14$ ), and child's age in kindergarten ( $r = .07$ ) were all correlated with peer social competence in kindergarten and were therefore entered into the regression models as control variables. These correlations are generally in the expected directions, but weakly correlated with the outcome variable. Correlations among the constructs of the two bags task, at wave 2 and wave 3, and peer social competence are reported in Tables 6 and 7, respectively. The parent and child constructs correlate in the expected directions with peer social competence in kindergarten. Correlations between children's expressive language ability, at waves 2 and 3, and children's peer social competence in kindergarten are also in the expected directions and are reported in Table 8.

#### **Pattern of Relations in Two Bags Task Constructs and Child Expressive Language Ability**

The means and standard deviations for the constructs of the Two Bags Task, and child expressive language ability, for waves 2 and 3, and for the autism and typically developing sub-samples are depicted in Table 9. The mean differences in constructs

between autism and typically developing sub-samples at wave 2 are reported in Table 10. At wave 2, caregivers of children who are typically developing demonstrated greater stimulation of cognitive development ( $M = 4.14$ ,  $SD = 1.07$ ) compared to caregivers of children with autism ( $M = 3.72$ ,  $SD = 0.96$ );  $t(100)=2.33$ ,  $p = 0.022$  as well as greater detachment ( $M = 1.06$ ,  $SD = 0.32$ ) compared to caregivers of children with autism ( $M = 1.01$ ,  $SD = 0.11$ );  $t(100)=5.91$ ,  $p = 0.000$ . At wave 2, children who are typically developing demonstrated greater expressive language ability ( $M = 0.60$ ,  $SD = 0.23$ ) compared to children with autism ( $M = 0.26$ ,  $SD = 0.05$ );  $t(100)=10.54$ ,  $p = 0.000$ , greater engagement with caregiver ( $M = 4.59$ ,  $SD = 1.12$ ) compared to children with autism ( $M = 3.75$ ,  $SD = 1.16$ );  $t(100)=3.72$ ,  $p = 0.000$ , and greater sustained attention ( $M = 4.51$ ,  $SD = 1.12$ ) compared to children with autism ( $M = 3.60$ ,  $SD = 0.96$ );  $t(100)=4.86$ ,  $p = 0.000$ . The mean differences in constructs between autism and typically developing sub-samples in wave 3 are reported in Table 11. At wave 3, children who are typically developing demonstrated less negativity toward caregiver ( $M = 1.31$ ,  $SD = 0.68$ ) compared to children with autism ( $M = 2.08$ ,  $SD = 1.73$ );  $t(100)=-1.99$ ,  $p = 0.05$  and greater expressive language skills ( $M = 0.83$ ,  $SD = 0.13$ ) compared to children with autism ( $M = 0.70$ ,  $SD = 0.21$ );  $t(100)=3.46$ ,  $p = 0.001$ .

Within group mean differences in constructs at wave 2 and wave 3 for children with autism are reported in Table 12; scales that changed between wave 2 and wave 3 were excluded from this analysis and this table. Caregivers of children with autism demonstrate greater intrusiveness at wave 3 ( $M = 1.82$ ,  $SD = 1.19$ ) compared to wave 2 ( $M = 1.29$ ,  $SD = 0.63$ );  $t(100)=-2.24$ ,  $p = 0.027$  as well as greater detachment ( $M = 1.14$ ,

SD = 0.66) compared to wave 2 (M = 1.01, SD = 0.11);  $t(100)=-3.21$ ,  $p = 0.002$ . Within group mean differences in constructs at wave 2 and wave 3 for children who are typically developing are reported in Table 13; again, scales that changed between wave 2 and wave 3 were excluded from this table. Caregivers of children who are typically developing demonstrated greater intrusiveness at wave 3 (M = 1.50, SD = 0.84) compared to wave 2 (M = 1.18, SD = 0.53);  $t(100)=-16.79$ ,  $p = 0.000$ , greater negative regard at wave 3 (M = 1.17, SD = 0.48) compared to wave 2 (M = 1.11, SD = 0.42);  $t(100)=-5.42$ ,  $p = 0.000$ , and greater detachment at wave 3 (M = 1.30, SD = 0.67) compared to wave 2 (M = 1.06, SD = 0.32);  $t(100)=-18.88$ ,  $p = 0.000$ . Children who are typically developing demonstrated greater engagement of caregiver at wave 2 (M = 4.59, SD = 1.12) compared to wave 3 (M = 4.49, SD = 0.87);  $t(100)=4.08$ ,  $p = 0.000$ .

### **Predictors of Peer Social Competence in Kindergarten**

Following a comparison of the mean differences, a series of models examined the role of various predictor variables, as well as their interaction effect with autism status, on peer social competence in kindergarten. Each of the five predictor variables (parental sensitivity, parental emotional supportiveness, parental stimulation of cognitive development, parental intrusiveness and child expressive language ability) were examined at wave 2 and/or wave 3 for their impact on peer social competence in kindergarten. Finally, the regressions testing the three-way interaction effects of the parental construct, autism, and child expressive language ability were also examined. Coefficients and  $R^2$  for each of the hierarchical linear regression models are reported in their corresponding tables (14-27). In each model, covariates of child gender, income,

and age at kindergarten were entered at step 1 and were significant predictors of peer social competence in kindergarten at each step.

**Parental Sensitivity.** In the hierarchical linear regression examining parental sensitivity (wave 2) and autism status on peer social competence at kindergarten (Table 14), autism was entered at step 2 and was both significantly negatively associated with peer social competence at kindergarten ( $B = -.861, p < .001$ ) and significantly predicted additional variance in peer social competence in kindergarten ( $\Delta R^2 = .021, F_{(1,100)} = 14.79, p < .001$ ). Parental sensitivity was entered in at step 3 and, contrary to the hypothesis, was not significantly associated with peer social competence in kindergarten, nor did it predict any additional variance. Furthermore, the interaction term (parental sensitivity x autism status) was entered in at step 4 and also was not significantly associated with peer social competence in kindergarten, nor did it predict any additional variance.

**Parental Emotional Supportiveness.** In the regression model examining parental emotional supportiveness (wave 3) and autism status on peer social competence at kindergarten (Table 15), autism status was entered at step 2 and was again significantly negatively associated with peer social competence at kindergarten ( $B = -.850, p < .01$ ) and significantly predicted additional variance ( $\Delta R^2 = .018, F_{(1,100)} = 9.21, p < .01$ ). Contrary to the hypothesis, but consistent with wave 2 findings, neither parental emotional supportiveness (entered at step 3) or the interaction term of parental emotional supportiveness x autism status (entered at step 4) were significantly associated with peer social competence in kindergarten, nor did they predict any additional variance.

**Parental Stimulation of Cognitive Development.** In the regression model examining parental stimulation of cognitive development (wave 2) and autism status on peer social competence at kindergarten (Table 16), autism status was entered at step 2 and was significantly negatively associated with peer social competence at kindergarten ( $B = -.861, p < .001$ ) and significantly predicted additional variance in peer social competence in kindergarten ( $\Delta R^2 = .021, F_{(1,100)} = 14.79, p < .001$ ). Parental stimulation of cognitive development was entered in at step 3 and the interaction of this construct with autism was entered in at step 4. Neither variable was significantly associated with peer social competence in kindergarten, nor did they predict any additional variance.

The regression of parental stimulation of cognitive development (wave 3) and autism status on peer social competence at kindergarten (Table 17) was examined. Autism status was entered at step 2 and was significantly negatively associated with peer social competence at kindergarten ( $B = -.850, p < .01$ ) and significantly predicted additional variance in peer social competence in kindergarten ( $\Delta R^2 = .018, F_{(1,100)} = 9.21, p < .01$ ). Parental stimulation of cognitive development was entered in at step 3 and was significantly positively associated with peer social competence at kindergarten ( $B = .036, p < .05$ ) and significantly predicted additional variance in peer social competence at kindergarten ( $\Delta R^2 = .003, F_{(1,100)} = 3.90, p < .05$ ). Additionally, autism remained significant ( $B = -.851, p < .01$ ) at step 3. The interaction term of parental stimulation of cognitive development x autism status was entered in at step 4. This interaction was significantly positively associated with ( $B = .272, p < .05$ ) and predicted additional variance in ( $\Delta R^2 = .002, F_{(1,100)} = 5.04, p < .05$ ) peer social competence at kindergarten.

There was a small but reliable effect size for the interaction of parental stimulation of cognitive development (wave 3) x autism status on children's peer social competence in kindergarten. This interaction showed that for children with autism, parental stimulation of cognitive development at wave 3 had a stronger positive impact on peer social competence in kindergarten, relative to typically developing children (see Figure 1).

When this interaction term was entered into the model, autism remained significant ( $B = -2.026$ ,  $p < .001$ ), but the association between parental stimulation of cognitive development and peer social competence at kindergarten was no longer significant.

**Parental Intrusiveness.** Parental intrusiveness (wave 2) and autism were examined as predictors of peer social competence (Table 18). In this model, autism status was entered at step 2 and was significantly negatively associated with ( $B = -.861$ ,  $p < .001$ ) and significantly predicted additional variance in ( $\Delta R^2 = .021$ ,  $F_{(1,100)} = 14.79$ ,  $p < .001$ ) peer social competence in kindergarten. Parental intrusiveness was entered in at step 3 and was significantly negatively associated with peer social competence in kindergarten ( $B = -.062$ ,  $p < .01$ ) and significantly predicted additional variance in peer social competence in kindergarten ( $\Delta R^2 = .003$ ,  $F_{(1,100)} = 7.70$ ,  $p < .01$ ). Autism status remained significant ( $B = -.846$ ,  $p < .001$ ) at step 3. The interaction term (parental intrusiveness x autism status) was entered in at step 4 but was not significantly associated with peer social competence in kindergarten, nor did it predict any additional variance.

In the regression model examining parental intrusiveness (wave 3) and autism status on peer social competence at kindergarten (Table 19), autism status was entered at step 2 and was significantly negatively associated ( $B = -.850$ ,  $p < .01$ ) with peer social

competence in kindergarten and significantly predicted additional variance ( $\Delta R^2 = .018$ ,  $F_{(1,100)} = 9.20$ ,  $p < .01$ ). Parental intrusiveness was entered in at step 3 and, along with autism status ( $B = -.837$ ,  $p < .01$ ) was significantly negatively associated with peer social competence in kindergarten ( $B = -.038$ ,  $p < .05$ ) and significantly predicted additional variance ( $\Delta R^2 = .002$ ,  $F_{(1,100)} = 4.66$ ,  $p < .01$ ). The interaction term of parental intrusiveness x autism status was entered in at step 4 but was not significantly associated with peer social competence in kindergarten, nor did it predict any additional variance.

**Child Expressive Language.** Child expressive language ability (at wave 2 and at wave 3) was examined as a predictor of peer social competence in kindergarten. In the model where child expressive language ability (wave 2) and autism were regressed on peer social competence in kindergarten (Table 20), autism status was entered in with the covariates at step 1 and was significantly negatively associated with peer social competence in kindergarten ( $B = -.975$ ,  $p < .001$ ). Child expressive language ability (wave 2) was entered in step 2 and was significantly positively associated with peer social competence in kindergarten ( $B = .341$ ,  $p < .001$ ) and significantly predicted additional variance in peer social competence in kindergarten ( $\Delta R^2 = 0.13$ ,  $F_{(1,100)} = 39.55$ ,  $p < .001$ ). Autism status ( $B = -8.45$ ,  $p < .001$ ) remained significant at step 2. The interaction term (child expressive language ability x autism status) was entered at step 3 and was both significantly positively associated with ( $B = .941$ ,  $p < .01$ ) and significantly predicted additional variance ( $\Delta R^2 = .002$ ,  $F_{(1,100)} = 6.80$ ,  $p < .01$ ) in peer social competence in kindergarten. There was a small but reliable effect size for the interaction of child expressive language (wave 2) x autism status on peer social competence in



kindergarten. This interaction showed that for children with autism, child expressive language ability at wave 2 had a stronger positive impact on peer social competence in kindergarten, relative to typically developing children (see Figure 2). Additionally, autism status ( $B = -1.045$ ,  $p < .001$ ) and children's expressive language ability ( $B = .325$ ,  $p < .001$ ) remained significant at step 3.

In the regression model examining child expressive language ability (wave 3) and autism status on peer social competence in kindergarten (Table 21), autism status was entered in with the covariates at step 1 and was significantly negatively associated with peer social competence in kindergarten ( $B = -.909$ ,  $p < .001$ ). Child expressive language ability (wave 3) was entered in at wave 2 and was significantly positively associated with peer social competence in kindergarten ( $B = .419$ ,  $p < .001$ ) and significantly predicted additional variance ( $\Delta R^2 = .007$ ,  $F_{(1,100)} = 12.41$ ,  $p < .001$ ). Autism status ( $B = -.815$ ,  $p < .001$ ) remained significant at step 2. The interaction term (child expressive language ability x autism status) was entered in at step 3 and was both significantly positively associated with ( $B = 1.054$ ,  $p < .05$ ) and significantly predicted additional variance in ( $\Delta R^2 = .003$ ,  $F_{(1,100)} = 4.56$ ,  $p < .05$ ) peer social competence in kindergarten. There was a small but reliable effect size for the interaction of child expressive language (wave 3) x autism status on peer social competence in kindergarten. This interaction showed that for children with autism, child expressive language ability at wave 3 had a stronger positive impact on peer social competence in kindergarten, relative to typically developing children (see Figure 3). Additionally, autism status ( $B = -1.474$ ,  $p < .001$ ) and child expressive language ability ( $B = .355$ ,  $p < .01$ ) remained significant at step 3.

**Parental Construct x Child Expressive Language x Autism.** Lastly, a series of hierarchical linear regression models examined the three-way interaction effects of each of the parental constructs (at wave 2 and/or at wave 3), autism status, and child expressive language ability (at wave 2 and at wave 3) on peer social competence in kindergarten (Tables 22-27). In all models, the significant covariates and autism status were entered in at step 1 and were significantly associated with peer social competence in kindergarten. At step 2, the parental construct and child expressive language ability, for the corresponding wave, entered the model. The interaction term of the parental construct x child expressive language ability was entered at step 3. Lastly, the interaction terms of the parental construct x autism status, child expressive language ability x autism status, and the parental construct x autism status x child expressive language ability, were entered into the model at step 4. None of the interaction effects in any of the models were significant. Thus, the interpretable model for each regression (described below) is through step 2.

In the regression examining parental sensitivity (wave 2), child expressive language ability (wave 2), and autism status, on peer social competence in kindergarten (Table 22), autism status ( $B = -.735$ ,  $p < .01$ ) and child expressive language ability ( $B = .363$ ,  $p < .001$ ) were significantly associated with peer social competence at kindergarten and significantly predicted additional variance in peer social competence in kindergarten ( $\Delta R^2 = .015$ ,  $F_{(2,100)} = 16.52$ ,  $p < .001$ ). Parental sensitivity was not significantly associated with peer social competence in kindergarten.

In the regression examining parental emotional supportiveness (wave 3), child expressive language ability (wave 3), and autism status, on peer social competence in kindergarten (Table 23), autism status ( $B = -.686$ ,  $p < .05$ ) and child expressive language ability ( $B = .400$ ,  $p < .01$ ) were significantly associated with peer social competence at kindergarten and significantly predicted additional variance in peer social competence in kindergarten ( $\Delta R^2 = .006$ ,  $F_{(2,100)} = 4.75$ ,  $p < .01$ ). Parental emotional supportiveness, however, was not significantly associated with peer social competence in kindergarten.

Two regressions also examined parental stimulation of cognitive development, child expressive language ability, and autism status, on peer social competence at kindergarten. At wave 2 (Table 24), autism status ( $B = -.733$ ,  $p < .01$ ) and child expressive language ability ( $B = .362$ ,  $p < .001$ ) were significantly associated with peer social competence at kindergarten and significantly predicted additional variance in peer social competence in kindergarten ( $\Delta R^2 = .015$ ,  $F_{(2,100)} = 16.34$ ,  $p < .001$ ). Parental stimulation of cognitive development, however, was not significantly associated with peer social competence in kindergarten. Similarly, at wave 3 (Table 25), autism status ( $B = -.691$ ,  $p < .01$ ) and child expressive language ability ( $B = .376$ ,  $p < .01$ ) were significantly associated with peer social competence at kindergarten and significantly predicted additional variance in peer social competence in kindergarten ( $\Delta R^2 = .008$ ,  $F_{(2,100)} = 4.85$ ,  $p < .01$ ). However, parental stimulation of cognitive development was not significantly associated with peer social competence in kindergarten.

Finally, two regressions were run to examine parental intrusiveness, child expressive language ability, and autism status, on peer social competence in kindergarten.

At wave 2 (Table 26), autism status ( $B = -.724$ ,  $p < .01$ ), parental intrusiveness ( $B = -.052$ ,  $p < .05$ ), and child expressive language ability ( $B = .358$ ,  $p < .001$ ) were significantly associated with peer social competence at kindergarten and significantly predicted additional variance in peer social competence in kindergarten ( $\Delta R^2 = .017$ ,  $F_{(2,100)} = 16.22$ ,  $p < .001$ ). Similarly, at wave 3 (Table 27), autism status ( $B = -.673$ ,  $p < .05$ ), parental intrusiveness ( $B = -.040$ ,  $p < .05$ ), and child expressive language ability ( $B = .387$ ,  $p < .01$ ) were significantly associated with peer social competence at kindergarten and significantly predicted additional variance ( $\Delta R^2 = .009$ ,  $F_{(2,100)} = 7.15$ ,  $p < .001$ ) in peer social competence in kindergarten.

## CHAPTER IV

### DISCUSSION

The overall intention of this study was to explore how parent-child play during the early childhood years may contribute to later social outcomes at kindergarten entry, especially for children with autism. The theoretical ideas of Vygotsky suggest social relationships scaffold learning. In early childhood, both parent-child and peer-child scaffolding often occur through the medium of play. The guiding principle of this study was that if parents can facilitate social skills for children through their early parent-child play interactions, then children would be better able to access and positively interact with their peers in kindergarten. This longitudinal development of social competence through play interactions was especially of interest for children with autism, given the inherent deficits in social and communicative skills associated with the diagnosis.

Strengths of this study include the use of a nationally representative and large data set, with a sufficient number of children to examine subsamples of typically developing children and children diagnosed with autism during early childhood. Additionally, this study draws upon a range of measures, including observational measures of parent-child dyadic interactions and teacher reported peer social competence. The use of a longitudinal design permits a greater investigation of change over time and the importance of child and parent predictors of a critical outcome of peer social competence

at kindergarten entry. Furthermore, research questions were examined using the ECLS-B dataset because of the access to data from community samples of children with autism, especially given that current literature is lacking in large scale longitudinal research with children with autism and typically developing children.

In addressing the two research questions of this study, between- and within-group patterns were first examined across time to provide a description of the differences in parental behaviors as well as in the development for children with ASD, compared to TD children. Next, the predictor variables of peer social competence in kindergarten were examined.

### **Between Group Differences in Parent and Child Behaviors**

Consistent with the hypothesis, at both waves 2 (2 years) and 3 (preschool), typically developing children demonstrated greater expressive language abilities compared to children with autism. This deficit in expressive language abilities for children with autism has been reliably documented in past research (Mitchell et al., 2006; Zwaigenbaum et al., 2005). As further discussed below, children's expressive language abilities also have a direct relation to peer social competence in kindergarten. These deficits put children with autism at a disadvantage during social interactions, making communication with caregivers and peers more difficult, and thus placing greater importance on understanding other factors that may contribute to peer social competence in kindergarten.

Overall, there were fewer between group mean differences in child and parent behaviors at wave 3 (preschool) than at wave 2 (2 years) and these patterns will be

discussed next. Regarding child behaviors, in general, children with autism, at both waves, demonstrated less adaptive behaviors towards caregivers, compared to typically developing children. At wave 2, children with autism demonstrated less engagement of parents and less sustained attention, compared to typically developing children. These findings are consistent with research suggesting that children with autism have less interest in social exchanges (Landa et al., 2007) than their typically developing peers. At wave 3, this study found that children with autism demonstrated greater negativity toward parents, compared to typically developing children. Children with autism often exhibit problem behaviors when over-stimulated. Thus, during an observational task where children and parents are to interact with one another for a specified time, it follows that children with autism may demonstrate greater negative expressions towards parents in situations that are socially taxing.

Consistent with the hypothesis, parents of children with autism demonstrated less stimulation of cognitive development at wave 2 (2 years), compared to parents of typically developing children. Parental stimulation of cognitive development reflects parent's engagement of teachings related to language, cognitive, or perceptual skill growth (Andreassen & Fletcher, 2007; Najarian et al., 2010). Parents of children with autism may have greater difficulty engaging their children within their zone of proximal development, especially given the potentially inconsistent patterns of development across domains (Landa et al., 2007), thus making it more challenging to appropriately scaffold learning. Inconsistent with the hypothesis, parents of children with autism demonstrated less detachment at wave 2, compared to parents of typically developing children. This

could suggest that even though children with autism are demonstrating fewer prosocial behaviors towards parents, these parents are still attempting to find ways to engage with their children. The difference between detachment scores of parents of TD children and children with ASD may reflect a greater desire for parents of children with autism to connect with their child, given their child's social deficits. Interestingly, though inconsistent with the hypothesis, in this study, by wave 3 (preschool) there were no differences in parent behaviors between parents of children with and without autism. In examining the mean differences for parental stimulation of cognitive development, it appears parents of children with autism are doing less at wave 2 but increasing by wave 3, possibly due to their children acquiring skills at a slower rate or possibly because parents are making adjustments to their own behaviors as a result of increased knowledge about their child's behaviors relative to an autism diagnosis or increased access to supports or early interventions, while parents of typically developing children are staying relatively consistent. Thus, parents of children with autism are becoming more comparable to parents of typically developing children, in terms of the dyadic interactions, over time.

### **Within Group Differences in Parent and Child Behaviors**

Within group parent and child behavior patterns for waves 2 (2 years) and 3 (preschool) differ depending on the sub-sample. Child behaviors were not statistically different between waves 2 and 3 for children with autism, suggesting relatively stable behavioral presentations across time points. However, parents of children with autism demonstrated greater intrusiveness and greater detachment at wave 3 compared to wave



2. This suggests that by preschool age, parents of children with autism are becoming more directive and controlling in their interactions with their children as well as demonstrating a greater disconnect in their amount and quality of engagement with their children.

Overall, for the typically developing sub-sample, both children and parents are demonstrating less adaptive and prosocial behaviors towards one another at wave 3 (preschool) compared to wave 2 (2 years). Typically developing children demonstrated greater engagement of parent at wave 2, compared to wave 3, suggesting that by preschool age, children may be relying less on caregiver stimulation and are better able to play alone. It could be that preschool children have had more access to stimulating activities (e.g., video games, TV, interactive toys, interacting with peers/siblings, etc.) at home, that sustain their attention for longer periods of time, which may translate to less exposure to caregiver interactions. At the same time, parents of typically developing children are demonstrating greater intrusiveness, negative regard, and detachment at wave 3 compared to wave 2. Thus, by preschool age, parents of typically developing children are becoming more directive and controlling in their interactions with their children, are showing greater negativity in their expressions towards their children and are demonstrating greater disconnect in the amount and quality of engagement with their children. It's likely that by preschool, parents and children have developed routines or patterns of behaviors that have a bidirectional impact on their interactions with one another.

## **Predictors of Peer Social Competence in Kindergarten**

A second aim of this study was to investigate differences in predictors of peer social competence in kindergarten, based on child autism status. Previous studies have shown that children with autism demonstrate deficits in peer social competence, compared to typically developing peers (Meek, Robinson, & Jahromi, 2012). Similarly, this study found that peer social competence in kindergarten was lower for children with autism compared to typically developing children. This study also confirmed, like prior research on preschool samples (Mendez, McDermott & Fantuzzo, 2002), that kindergarten children who were younger, male, and from a low-income background had lower peer social competence at kindergarten entry.

As expected, child expressive language ability was found to be a significant predictor of peer social competence in kindergarten. Previous research studies have shown the reverse to be true as well; children are more likely to demonstrate social competence with their peers when they have better developed communication skills (Mendez et al., 2002; U.S. Department of Health and Human Services, 2003). Results indicated a main effect of child expressive language ability, both at wave 2 and at wave 3, on peer social competence in kindergarten, such that higher levels of child expressive language ability were associated with greater peer competence in kindergarten. Additionally, results showed small but reliable effect sizes for the positive interaction effect of autism and child expressive language ability, both at wave 2 and at wave 3, on peer social competence in kindergarten. Thus, for children with autism, child expressive language ability at wave 2 (see Figure 2) and at wave 3 (see Figure 3) had a stronger

positive impact on peer social competence in kindergarten, relative to typically developing children. Overall, children who are better able to utilize expressive communication had greater peer social competence in kindergarten, and this relation is even stronger for children with autism. However, as previously discussed, this study also found that children with autism demonstrated lower expressive language abilities at both waves 2 and 3, compared to their typically developing peers. Therefore, given the inherent social and communicative deficits in children with autism, it is especially important to examine other factors that may contribute to peer social competence, as well as factors that will augment children's expressive language skills, so that we may better prepare children with autism for success. If children with autism can acquire greater peer social skills in their formative years, (e.g., through their play interactions with caregivers), they may have a better opportunity to be in inclusive classrooms and learn from their peers.

Observed parental behaviors, at wave 2 and wave 3 were examined as possible contributors to peer social competence in kindergarten. Results indicated that some parent constructs were predictors of peer social competence in kindergarten, and that these findings were differentially important for children based on autism status. Contrary to the hypothesis, neither parental sensitivity at wave 2 nor parental emotional supportiveness at wave 3, were significant predictors of peer social competence in kindergarten. However, a main effect of a negative relation was found for parental intrusiveness (at both waves) on peer social competence. Furthermore, an interaction effect of autism and parental stimulation of cognitive development was found, such that for children with autism,

parental stimulation of cognitive development (at wave 3) had a stronger positive impact on peer social competence, relative to typically developing children.

Contrary to a large body of literature that demonstrates that parental sensitivity/responsivity (Beckwith et al., 1999; Landry, Smith, Swank, Assel, and Vellet, 2001) as well as parental emotional supportiveness (Haven, Manangan, Sparrow, & Wilson, 2014) are both positively related to peer social competence, this study found that neither parental sensitivity (wave 2) nor parental emotional supportiveness (wave 3) had any predictive power for peer social competence in kindergarten. It is possible the peer social competence measure, as assessed by kindergarten teachers, may reflect too narrow of a skill, based on the five items that comprised the construct, to be directly impacted by parental sensitivity or parental emotional supportiveness, as measured by the observational lab task. Previous research, however, has linked parental sensitivity to greater language gains for children (Hudson, Levickis, Down, Nicholls, and Wake, 2005 & Tamis-LeMonda, Bornstein, and Baumwell, 2001). Thus, in this study, while parental sensitivity and parental emotional supportiveness on their own are not helping children become more socially competent, they could be impacting children's expressive language ability, which was shown to have a direct impact on peer social competence in kindergarten.

Consistent with the hypothesis, this study did however find the construct of parental stimulation of cognitive development to have predictive power for peer social competence in kindergarten. Specifically, there was a small but reliable effect size for the interaction of parental stimulation of cognitive development (at wave 3) and autism on

peer social competence in kindergarten. The positive association was such that higher observed parental stimulation of cognitive development (at wave 3) was associated with greater peer social competence and this association was stronger for children with autism, relative to typically developing children (see Figure 1). Therefore, it is especially important for parents of children with autism to maintain a solid understanding of their child's developmental level, across domains, so that they can appropriately scaffold learning at or slightly above their child's capabilities. Parents' direct attempts to teach skills to children have a positive impact on peer social competence. It may be that these interactions with caregivers are helping children learn how to learn from others, therefore, setting the groundwork for optimizing naturalistic peer scaffolding opportunities during school-age years. Additionally, parental stimulation of cognitive development may also be impacting children's expressive language skills, which was also positively related to peer social competence in kindergarten.

Results of this study also determined main effects of parental intrusiveness at wave 2 (2 years) and at wave 3 (preschool) on peer social competence in kindergarten. Both associations were negative such that higher observed parental intrusiveness was associated with less peer social competence in kindergarten. This finding contributes to existing literature that documents the negative implications of parental intrusiveness on child outcomes (e.g., Clincy & Mills-Koonce, 2013). It seems unlikely that parents would be more directive and controlling with their children when they are being observed in a research setting, relative to their interactions in home settings. Thus, it is probable that parents, who consistently demonstrate parental intrusiveness on the Two Bags Task (e.g.,

at both waves), are likely demonstrating intrusiveness in other settings with their children as well. The negative impact of parental intrusiveness, for toddlers as well as for preschool children, on peer social competence in kindergarten, suggests that this parental behavior may be an area that would benefit from additional attention throughout the early childhood years. Interestingly, though this study found that parental intrusiveness was harmful to later peer social competence, none of the interaction terms of parental intrusiveness and autism were significant. While it may be that the sample size of children with autism was not large enough, and therefore may have been limited in the power to detect possible interaction effects, it may also be that parental intrusiveness is less harmful for children with autism. Given studies that have found that children with autism play longer in structured vs. unstructured tasks (Freeman & Kasari, 2013) or that have found a positive correlation between parent initiated play behaviors and children's compliance and persistence (Patterson, Elder, Gulsrud, & Kasari, 2014), it could be that some level of directiveness is facilitative for children with autism due to the nature of their social difficulties.

### **Limitations and Future Research**

There are six main limitations or future directions identified through this study that will be discussed below. First, although this study used a large, nationally representative community sample, this study is limited by its small sample size of children with autism, which likely results in lower power to detect significant findings. Second, the Two Bags Task may not perfectly capture play or reflect naturalistic play interactions. Third, this study highlights the need for more observational studies that

explore the level of directiveness involved in how parents play with and teach their children with autism. Fourth, the constructs of parental stimulation of cognitive development and parental intrusiveness should be examined in relation to sustained attention for children with autism. Fifth, we should examine the role of parent insightfulness on parental behaviors during interactions with their children. Finally, the impact of receiving an ASD diagnosis should be examined in relation to the impact on parental behaviors.

Although the ECLS-B dataset was chosen because of its ample data on children with autism, when combined with a restricted variance, this study is still limited by its small sample size of children with autism, which makes it more difficult to detect interaction effects. Covarying out child gender, income, and age at kindergarten may have taken up much of the variance in the outcome measure. Furthermore, the heterogeneity in impairments of children with autism, in addition to the multitude of variables that are at play (e.g., parental factors, expressive language, etc.) that can influence outcomes, necessitates the use of larger samples. Additionally, given that the analytic sample of children with autism was ~50, some of the statistical regression analyses (in addressing Research Question 2) may not have had enough power to detect significant findings. Having a greater sample size of children with autism may not only further reveal the heterogeneity in autism but may also better our understanding of factors, to be targeted in early interventions, that can contribute to greater advancements in skills for children with autism. It should also be acknowledged that although this study utilized extensive exclusion criteria to create the typically developing and autism sub-

samples, children in the typically developing sub-sample may still have had undiagnosed delays or autism. Finally, while most of the t-tests performed in addressing Research Question 1 resulted in moderate to large effect sizes, it should be noted that there was no correcting for multiple tests, which could have increased the possibility of identifying chance findings.

The Two Bags Task was used as the measure of parent-child play interaction for this study and involved multiple teaching, learning, and free-play opportunities during a 10-minute parent-child interaction. It would be interesting for future studies to parse out what parent and child behaviors are observed in the different contexts of free play and book reading (referring to the contents of the two bags). For example, even when parents and children are reading the book, it could have been a playful exchange. However, those details are unclear, and while observational tasks provide rich information, we should be cautious about concluding that interactions on this task accurately mirror typical play interactions in the home. Additionally, while the Two Bags Task may not perfectly capture play, this type of interaction may be more representative of what children with autism are able to do with their caregivers. Previous research has shown that children with autism play more in structured vs. unstructured tasks (Freeman & Kasari, 2013). Thus, it would likely be more difficult for children with autism to interact with caregivers in more unstructured, but possibly more naturalistic, scenarios (e.g., outdoor play or indoor play with more stimuli or access to various toys/objects). The Two Bags Task provides opportunities to engage in activities that can be more structured and/or less stimulating (e.g., book activity) as well as activities that could involve more imagination



or creativity (e.g., playing with dishes or playdoh) depending on child and parental behaviors on those tasks. It would also be interesting for future studies to examine the total number of minutes spent in the task for children with autism. For example, researchers could examine whether children with autism are interacting with their caregiver for the entire 10 minutes or if they are aborting the task earlier, thereby limiting opportunities for parents to demonstrate the coded parental behaviors.

This study also highlights the need for more observational studies of how parents play with and teach their children with autism. Specifically, studies should focus on the level of directiveness parents utilize as well as the content surrounding what they are teaching (e.g., focusing on language acquisition vs. academic tasks, etc.). While it may be that parental intrusiveness is less harmful to children with autism, compared to typically developing children, we need more data to definitively support this conclusion. Additionally, it would be important to examine the level of directiveness and the context within which it presents. For example, it may be that increased directiveness in social settings provides additional structure that helps mitigate overstimulation for children with autism, thus, creating an environment where children are more regulated and better able to engage in interactions with caregivers. It could also be that directive behaviors at times help parents capture their child's attention, which provides opportunities for teaching moments. Furthermore, some aspects of directiveness, such as teaching or showing, may remove the ambiguity in play and the necessity to infer intentions, while other aspects, such as physical intrusiveness may be overwhelming and hinder the duration of the play interaction. As this study demonstrates, parental stimulation of cognitive development is

beneficial for peer social competence of children with autism. Therefore, future research should examine the molecular components of parental intrusiveness and parental stimulation of cognitive development to inform target areas of intervention with parents as well as to encourage peer social competence and communicative advancements for children with autism.

Parental stimulation of cognitive development in play interactions during the pre-school years may lay the foundation for teaching children how to learn from others. Learning from caregivers requires some level of auditory and/or visual attention. Thus, another avenue of research could be to examine the impact of parental intrusiveness and the impact of parental stimulation of cognitive development, on child behaviors, and specifically, child sustained attention. For example, Brigham et al. (2010) examined parent attentional cues and child sustained attention with objects, for children with autism, and found that sustained object attention was more often supported by parents' use of three or more attentional cues (e.g., verbal or physical behaviors), relative to one or two. Understanding patterns of learning for children with autism may better help caregivers advocate for school interventions and more optimal learning environments as well as help early intervention providers structure interventions to best facilitate skill acquisition, including gains in language and social competence.

Though parental sensitivity is widely studied, maybe for children with autism, research should also have a significant focus on examining parent insightfulness (e.g., understanding of autism, including symptom presentation, differential patterns of development across domains, environmental triggers for overstimulation, and the child's

subjective experiences). If parents have a better understanding of what an autism diagnosis means for their child, it follows that they would be better able to support growth and learning new skills in developmentally appropriate ways. The Insightfulness Assessment (IA; Oppenheim & Koren-Karie, 2009) is a semi-structured interview in which parents view three previously recorded segments of their play interactions with their child and, after each segment, are asked to comment on what thoughts and feelings they believed the child was experiencing during that particular interaction, if the behaviors observed were representative of the child's typical play, and what their reactions were to the segment. Only two groups of researchers (Hutman et al., 2009 and Oppenheim et al., 2009) appear to be considering the impact of insightfulness on the parent-child dyad with autism. Though a small literature exists on this topic, especially with respect to children with autism, the construct is sound, available, and currently underutilized, given its informative potential. Furthermore, the IA could be examined as an intervention tool where researchers could expand beyond the caregiver's transcribed comments and engage in a dialogue, that would encourage alternative perspectives, and potentially teach skills to help parents foster children's skills during their dyadic interactions. Changes in parental insightfulness could be tracked in terms of the construct's effectiveness as an early intervention method.

Lastly, in this study, we were unable to look at the impact of receiving the diagnosis of autism on the observed parental behaviors. Parents may react differently depending on whether they had suspected the diagnosis, or the possibility of it, or if the diagnosis came "out of the blue," (Ives, Munro, & Wynn, 2001). Some parents may even

go through a “mourning” phase in which they “grieve” the hopes or expectations they held regarding the life they had envisioned for their child (Poslawsky, Naber, van Daalen, & van Engeland, 2014). Negative reactions to a child’s diagnosis may hinder a parent’s ability to construe meaning from and appropriately respond to a child’s cues (Hutman, Siller & Sigman, 2009), which may make parents appear less attentive or engaged in the dyadic interactions. In this study, since autism was not asked about before wave 3, we only know that parents received a diagnosis of autism for their child sometime before either preschool or kindergarten entry. However, this study did show that parents of children with autism demonstrated greater intrusiveness and detachment at wave 3 (preschool) compared to wave 2 (2 years). Maybe parental behaviors changed once they got a diagnosis. Thus, future research should examine correlates between the impact of receiving the ASD diagnosis and observed parental behaviors during interactions with their children. Furthermore, given the findings of this study, future studies are needed to look specifically at observed parental intrusiveness and parental detachment as a result of the impact of receiving the diagnosis.

### **Implications for Early Interventions**

Many of the current early intervention approaches for children with autism target the acquisition of academic skills, functional behaviors and language skills through structured, direct instruction methods. The shortage of attention on everyday interactions to foster social and communication behaviors, which are a marked deficit for children with autism, for example through unstructured play time, may constitute a missed opportunity for capitalizing on the natural benefits of play with parents. Parents, or

primary caregivers, are the individuals that spend the most time with the developing child and are oftentimes the first informants of when development may be going awry (Ozonoff et al., 2009). Therefore, not only may we be able to utilize parent-child play interactions to identify early signs of concern, we may adapt successful early intervention approaches to focus on and teach relevant skills to parents.

Some therapy modalities already exist for working with parents of children with autism and are either underutilized or lack enough empirical validity. For example, Masse, McNeil, Wagner, and Chorney (2007) have found initial success using Parent Child Interaction Therapy (PCIT) with high functioning children with autism. PCIT is a dyadic intervention, for children ages 2-8 years and their caregiver, designed to improve the quality of the parent-child relationship and teach parents skills necessary to manage their child's problematic behaviors as well as to increase the positive and prosocial behaviors. For children with autism, this may be an especially useful intervention as it can target the child's disruptive/noncompliant behaviors and teach parents skills to help foster skill acquisition (e.g., self-regulation skills, increased vocabulary/communication). In a case study of two children diagnosed with ASD, Hansen and Shillingsburg (2016) reported findings that a modified PCIT for children with autism resulted in greater child vocalizations as well as increased positive parent behaviors.

These parental and dyadic components to early interventions are a valuable, underutilized opportunity that could help optimize both individual and interpersonal gains for children with autism, as well as other groups that need assistance with developing peer social competence. Early intervention programs give parents a head start to really

impact the social development of their child in a positive direction. Even though it may be more challenging to play with a child with autism, it will be important for their language and social skill development. Home visiting programs provide an ideal opportunity to implement these early interventions. Not only can providers help parents and children generalize skills learned to naturalistic environments, but they can help support parents in their efforts over several years to improve their child's peer social competence to better prepare them for success in kindergarten.

Early interventions can also have a significant impact on the parents of children with autism. Previous research has reliably documented that caregivers of children with autism report high levels of parenting stress (Hayes & Watson, 2012; Davis & Carter, 2008). Professional development efforts for early education and intervention professionals should consider how challenging it is for parents to follow protocols around playing with their child with autism. For example, this study found that children with autism are doing more poorly in the play interaction with caregivers, relative to typically developing children. Specifically, children with autism demonstrated less engagement with caregiver (at wave 2), less sustained attention (at wave 2), greater negativity toward caregiver (at wave 3), and less expressive language abilities (at both waves), compared to typically developing children. These results speak to the idea that it is potentially more challenging to play with children with autism. However, results also showed that parental stimulation of cognitive development (at wave 3; preschool) had a stronger positive impact on peer social competence in kindergarten for children with autism, relative to typically developing children. Thus, professional development efforts should also focus

on how to appropriately convey to parents of children with autism, using research evidence, that what they are doing in their play interactions could impact skill development over time. This additional psychoeducation for parents may help alleviate some stress and help parents feel more connected to their child, through validation from professionals as well as having a greater understanding of the role parents can play in supporting children's skill acquisition and a greater understanding of the long-term benefits of their efforts to play with children, especially in cognitively stimulating ways.

Lastly, this study confirmed a pattern, often observed in prior studies (e.g., Mendez, McDermott & Fantuzzo, 2002), that gender (male), age (younger), and income (lower) are all associated with lower peer social competence. Thus, research and practice should additionally devote attention to designing interventions, or prevention programs, that will target the needs of these populations and give them the necessary tools and experiences to facilitate peer social competence.

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APPENDIX A  
TABLES AND FIGURES

Table 1

Exclusion Criteria for Study Sample

	Wave 1	Wave 3	Wave 4	Wave 5	ASD + Significant Disability
“Blindness”	X				X
“Down Syndrome”	X				X
“Turner’s Syndrome”	X				X
“Spina Bifida”	X				X
“Any other types of special needs or limitations”	X				
“A problem with mobility such as cerebral palsy”		X	X	X	
“Another developmental delay”		X	X	X	
“Epilepsy or seizures”		X	X	X	X
“A heart defect”		X	X	X	
“Mental retardation”		X	X	X	X
“Oppositional Defiant Disorder”		X	X	X	
“ADHD”		X	X	X	
“Diabetes”		X	X	X	
“A blood disease”			X	X	
“Another chronic medical problem”			X	X	X

*Note:* The same conditions/problems were not always asked about in each wave. ASD = Autism Spectrum Disorder.

Table 2

Demographics of Children by Sub-Sample

Variable	ASD	TD
Gender (Wave 3)		
Male	82%	50%
Female	18%	50%
Race/ethnicity (Wave 1)		
White	83%	72%
Black/African American	20%	17%
Hispanic	21%	26%
Asian	2%	4%
Pacific Islander	0%	<1%
American Indian	< 1%	3%
Income (Wave 1)	\$35,001-50,000	\$30,000-40,000
Age at Kindergarten Entry	69.15 months	68.66 months

*Note:* ASD = Autism Spectrum Disorder. TD = Typically Developing

Table 3

Scales of the Two Bags Task at Waves 2 and 3

<b>Scales at 2-year wave</b>	<b>Scales at preschool wave</b>
Parental sensitivity	Parental emotional supportiveness
Parental positive regard	
Parental stimulation of cognitive development	Parental stimulation of cognitive development
Parental intrusiveness	Parental intrusiveness
Parental negative regard	Parental negative regard
Parental detachment	Parental detachment
Child engagement	Child engagement
Child sustained attention	Child quality of play
Child negativity	Child negativity

Table 4

Items, and Corresponding Cronbach's Alphas at Waves 4 and 5, Comprising the Peer Social Competence Outcome in Kindergarten

Item	Alpha – Wave 4	Alpha – Wave 5
“Child accepted by other children”	0.82	0.82
“Child makes friends easily”	0.80	0.81
“Child shares belongings with others”	0.83	0.83
“Child comforts others”	0.79	0.80
“Child tried to understand others”	0.80	0.81
Test Scale	0.84	0.85

*Note.* Sample weight applied = WK45T0.

Table 5

Correlations of Covariates with Peer Social Competence in Kindergarten

	1.	2.	3.	4.
1. Sex	-			
2. Income	.01	-		
3. Age at Kindergarten Entry	.02	-.01	-	
4. Peer Social Competence	-.20**	.14**	.07**	-

*Note.* \*p < .05, \*\*p < .01. N = 5150. Sample weight applied = WK45T0.

Table 6

Correlations of Wave 2 Constructs of the Two Bags Task with Peer Social Competence in Kindergarten

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Parental Sensitivity	-									
2. Parental Positive Regard	.61**	-								
3. Parental Stimulation of Cog Devt	.61**	.56**	-							
4. Parental Intrusiveness	-.35**	-.19**	-.18**	-						
5. Parental Negative Regard	-.36**	-.20**	-.18**	.43**	-					
6. Parental Detachment	-.36**	-.26**	-.25**	.03	.10**	-				
7. Child Engagement of Parent	.59**	.52**	.56**	-.24**	-.23**	-.21**	-			
8. Child Sustained Attention	.47**	.47**	.53**	-.18**	-.17**	-.13**	.74**	-		
9. Child Negativity toward Parent	-.29**	-.23**	-.21**	.43**	.33**	.06*	-.38**	-.39**	-	
10. Peer Social Competence	.11**	.10**	.13**	-.08**	-.05**	-.02	.17**	.17**	-.08**	-

Note. \*p < .05, \*\*p < .01. N = 4100. Sample weight applied = WK45T0.



Table 7

Correlation of Wave 3 Constructs of the Two Bags Task with Peer Social Competence in Kindergarten

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Parental Emotional Supportiveness	-								
2. Parental Stimulation of Cog Devt	.59**	-							
3. Parental Intrusiveness	-.15**	-.10**	-						
4. Parental Negative Regard	-.24**	-.15**	.41**	-					
5. Parental Detachment	-.33**	-.31**	.17**	.25**	-				
6. Child Engagement of Parent	.44**	.40**	-.20**	-.16**	-.17**	-			
7. Child Quality of Play	.40**	.48**	-.06**	-.10**	-.11**	.48**	-		
8. Child Negativity toward Parent	-.13**	-.12*	.55**	.35**	.15**	-.28**	-.10**	-	
9. Peer Social Competence	.07**	.10**	-.07**	-.06**	-.07**	.13**	.15**	-.09**	-

Note. \*p < .05, \*\*p < .01. N = 4400. Sample weight applied = WK45T0.

Table 8

Correlations of Children's Expressive Language Ability, at Waves 2 and 3, with Peer Social Competence in Kindergarten

	1.	2.	3.
1. Expressive Language <sub>mean</sub> – Wave 2	-		
2. Expressive Language <sub>mean</sub> – Wave 3	.40**	-	
3. Peer Social Competence	.22**	.20**	-

*Note.* \*p < .05, \*\*p < .01. N = 4850. Sample weight applied = WK45T0.

Table 9

Means of the Two Bags Task Constructs and Child Expressive Language Ability by Waves and Sub-Samples

Wave 2 Predictor Variable	Wave 2 (2-year)				Wave 3 Predictor Variable	Wave 3 (preschool)			
	ASD		TD			ASD		TD	
	(n = 50)		(n = 4450)			(n = 50)		(n = 4650)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Parent Scales – Two Bags Task					Parent Scales – Two Bags Task				
Sensitivity	4.81	1.05	4.79	0.95	Emotional supportiveness	4.71	0.99	4.43	0.91
Positive regard	4.12	1.36	4.29	1.01	Stimulation of cog dev't	4.31	1.10	4.18	0.95
Stimulation of cog dev't	3.72	0.96	4.14	1.07	Intrusiveness	1.82	1.19	1.50	0.84
Intrusiveness	1.29	0.63	1.18	0.53	Negative regard	1.35	0.64	1.17	0.48
Negative regard	1.21	0.49	1.11	0.42	Detachment	1.41	0.66	1.30	0.67
Detachment	1.01	0.11	1.06	0.32	Child Scales – Two Bags Task				
Child Scales – Two Bags Task					Engagement	4.04	1.27	4.49	0.87
Engagement	3.75	1.16	4.59	1.12	Quality of play	3.79	1.32	4.05	0.87
Sustained attention	3.60	0.96	4.51	1.12	Negativity	2.08	1.73	1.31	0.68
Negativity	1.42	0.65	1.35	0.75	Child Language Ability				
Child Language Ability					Expressive Language <sub>mean</sub>	0.70	0.21	0.83	0.13
Expressive Language <sub>mean</sub>	0.26	0.24	0.60	0.23					

Note. ASD = Autism Sample, TD = Typical Developing Sample. Sample weight applied = WK1C0.

Table 10

Mean Differences in the Two Bags Task Constructs and Child Expressive Language Ability, at Wave 2, by Sub-Sample

<b>Children with ASD vs. TD in Wave 2</b>	<b>Coef.</b>	<b>SE</b>
<b>Parent Scales – Two Bags Task</b>		
Sensitivity	-0.02	0.20
Positive Regard	0.17	0.28
Stimulation of cog dev't	0.41*	0.18
Intrusiveness	-0.12	0.13
Neg Regard	-0.10	0.09
Detachment	0.05**	0.01
<b>Child Scales – Two Bags Task</b>		
Engagement	0.84**	0.23
Sustained attention	0.91**	0.19
Negativity	-0.07	0.11
<b>Child Language Ability</b>		
Expressive Language <sub>mean</sub>	0.38**	0.04

Note: \* $p < .05$ , \*\* $p < .01$ .  $N = 4500$  for the Constructs of the Two Bags Task.  $N = 5550$  for Expressive Language Ability. Sample weight applied = WK1C0. A positive coefficient signifies that the mean of the typically developing group was higher than the mean of the autism group.

Table 11

Mean Differences in the Two Bags Task Constructs and Child Expressive Language Ability, at Wave 3, by Sub-Sample

<b>Children with ASD vs. TD in Wave 3</b>	<b>Coef.</b>	<b>SE</b>
<b>Parent Scales – Two Bags Task</b>		
Emotional supportiveness	-0.25	0.20
Stimulation of cog dev't	-0.12	0.27
Intrusiveness	-0.29	0.27
Neg Regard	-0.18	0.14
Detachment	-0.13	0.13
<b>Child Scales – Two Bags Task</b>		
Engagement	0.55	0.29
Quality of play	0.33	0.35
Negativity	-0.73*	0.37
<b>Child Language Ability</b>		
Expressive Language <sub>mean</sub>	0.17**	0.05

Note: \* $p < .05$ , \*\* $p < .01$ .  $N = 4800$  for the Constructs of the Two Bags Task.  $N = 5300$  for Expressive Language Ability. Sample weight applied = WK1C0. A positive coefficient signifies that the mean of the typically developing group was higher than the mean of the autism group.

Table 12

Mean Differences in the Two Bags Task Constructs for Children with Autism at Wave 2 and Wave 3

<b>Wave 2 vs Wave 3 in Children with ASD</b>	<b>Coef.</b>	<b>SE</b>
<b>Parent Scales – Two Bags Task</b>		
Stimulation of Cognitive Development	-0.57	0.31
Intrusiveness	-0.50*	0.22
Neg Regard	-0.13	0.31
Detachment	-0.42**	0.13
<b>Child Scales – Two Bags Task</b>		
Engagement	-0.19	0.30
Negativity	-0.62	0.35

Note: \*p < .05, \*\*p < .01. N = 100. Sample weight applied = WK1C0. A negative coefficient signifies that the mean of wave 3 is higher than the mean of wave 2. Constructs that changed from wave 2 to wave 3 were not included in within-group analyses.

Table 13

Mean Differences in the Two Bags Task Constructs for Typically Developing Children at Wave 2 and Wave 3

<b>Wave 2 vs Wave 3 in TD Children</b>	<b>Coef.</b>	<b>SE</b>
<b>Parent Scales – Two Bags Task</b>		
Stimulation of Cognitive Development	-0.04	0.03
Intrusiveness	-0.33**	0.02
Neg Regard	-0.06**	0.01
Detachment	-0.24**	0.01
<b>Child Scales – Two Bags Task</b>		
Engagement	0.10**	0.02
Negativity	0.04	0.02

Note: \*p < .05, \*\*p < .01. N = 9200. Sample weight applied = WK1C0. A positive coefficient signifies that the mean of wave 2 is higher than the mean of wave 3. Constructs that changed from wave 2 to wave 3 were not included in within-group analyses.

Table 14

Hierarchical Linear Regression of Parental Sensitivity (Wave 2) and Autism on Peer Social Competence in Kindergarten

Wave 2	Peer Social Competence in Kindergarten	
	B	R <sup>2</sup>
Step 1		.063
Gender	-.249***	
Income	.026***	
Age (K)	.016***	
Step 2		.084
Gender	-.237***	
Income	.026***	
Age (K)	.016***	
ASD	-.861***	
Step 3		.085
Gender	-.234***	
Income	.024***	
Age (K)	.016***	
ASD	-.861***	
SEN2	.019	
Step 4		.085
Gender	-.235***	
Income	.024***	
Age (K)	.016***	
ASD	-1.027	
SEN2	.018	
ASD x SEN2	.035	

Note: \*p < .05, \*\*p < .01, \*\*\*p < .001. N = 3400. Sample weight applied = WK45T0. Age (K) = age of child at kindergarten entry. ASD = Autism variable (0 = typically developing; 1 = autism). SEN2 = Parental Sensitivity at Wave 2.



Table 15

Hierarchical Linear Regression of Parental Emotional Supportiveness (Wave 3) and Autism on Peer Social Competence in Kindergarten

Wave 3	Peer Social Competence in Kindergarten	
	B	R <sup>2</sup>
Step 1		.055
Gender	-.232***	
Income	.024***	
Age (K)	.015***	
Step 2		.072
Gender	-.223***	
Income	.025***	
Age (K)	.016***	
ASD	-.850**	
Step 3		.072
Gender	-.223***	
Income	.025***	
Age (K)	.016***	
ASD	-.850**	
EMSPT3	.002	
Step 4		.073
Gender	-.223***	
Income	.024***	
Age (K)	.016***	
ASD	-1.491*	
EMSPT3	-.001	
ASD x EMSPT3	.139	

Note: \*p < .05, \*\*p < .01, \*\*\*p < .001. N = 3400. Sample weight applied = WK45T0. Age (K) = age of child at kindergarten entry. ASD = Autism variable (0 = typically developing; 1 = autism). EMSPT3 = Parental Emotional Supportiveness at Wave 3.

Table 16

Hierarchical Linear Regression of Parental Stimulation of Cognitive Development (Wave 2) and Autism on Peer Social Competence in Kindergarten

Wave 2	Peer Social Competence in Kindergarten	
	B	R <sup>2</sup>
Step 1		.063
Gender	-.249***	
Income	.026***	
Age (K)	.016***	
Step 2		.084
Gender	-.237***	
Income	.026***	
Age (K)	.016***	
ASD	-.861***	
Step 3		.085
Gender	-.232***	
Income	.024***	
Age (K)	.016***	
ASD	-.853***	
COG2	.021	
Step 4		.086
Gender	-.232***	
Income	.024***	
Age (K)	.016***	
ASD	-1.657**	
COG2	.019	
ASD x COG2	.218	

Note: \*p < .05, \*\*p < .01, \*\*\*p < .001. N = 3400. Sample weight applied = WK45T0. Age (K) = age of child at kindergarten entry. ASD = Autism variable (0 = typically developing; 1 = autism). COG2 = Parental Stimulation of Cognitive Development at Wave 2.

Table 17

Hierarchical Linear Regression of Parental Stimulation of Cognitive Development (Wave 3) and Autism on Peer Social Competence in Kindergarten

Wave 3	Peer Social Competence in Kindergarten	
	B	R <sup>2</sup>
Step 1		.055
Gender	-.232***	
Income	.024***	
Age (K)	.015***	
Step 2		.072
Gender	-.223***	
Income	.025***	
Age (K)	.016***	
ASD	-.850**	
Step 3		.075
Gender	-.224***	
Income	.021***	
Age (K)	.015***	
ASD	-.851**	
COG3	.036*	
Step 4		.077
Gender	-.225***	
Income	.021***	
Age (K)	.015***	
ASD	-2.026***	
COG3	.032	
ASD x COG3	.272*	

Note: \*p < .05, \*\*p < .01, \*\*\*p < .001. N = 3400. Sample weight applied = WK45T0. Age (K) = age of child at kindergarten entry. ASD = Autism variable (0 = typically developing; 1 = autism). COG3 = Parental Stimulation of Cognitive Development at Wave 3.

Table 18

Hierarchical Linear Regression of Parental Intrusiveness (Wave 2) and Autism on Peer Social Competence in Kindergarten

Wave 2	Peer Social Competence in Kindergarten	
	B	R <sup>2</sup>
Step 1		.063
Gender	-.249***	
Income	.026***	
Age (K)	.016***	
Step 2		.084
Gender	-.237***	
Income	.026***	
Age (K)	.016***	
ASD	-.861***	
Step 3		.086
Gender	-.234***	
Income	.024***	
Age (K)	.016***	
ASD	-.846***	
INT2	-.062**	
Step 4		.086
Gender	-.234***	
Income	.024***	
Age (K)	.016***	
ASD	-.852	
INT2	-.062**	
ASD x INT2	.004	

Note: \*p < .05, \*\*p < .01, \*\*\*p < .001. N = 3400. Sample weight applied = WK45T0. Age (K) = age of child at kindergarten entry. ASD = Autism variable (0 = typically developing; 1 = autism). INT2 = Parental Intrusiveness at Wave 2.

Table 19

## Hierarchical Linear Regression of Parental Intrusiveness (Wave 3) and Autism on Peer Social Competence in Kindergarten

Wave 3	Peer Social Competence in Kindergarten	
	B	R <sup>2</sup>
Step 1		.054
Gender	-.231***	
Income	.024***	
Age (K)	.015***	
Step 2		.072
Gender	-.222***	
Income	.025***	
Age (K)	.016***	
ASD	-.850**	
Step 3		.074
Gender	-.219***	
Income	.024***	
Age (K)	.016***	
ASD	-.837**	
INT3	-.038*	
Step 4		.074
Gender	-.219***	
Income	.024***	
Age (K)	.016***	
ASD	-.774	
INT3	-.037*	
ASD x INT3	-.035	

Note: \*p < .05, \*\*p < .01, \*\*\*p < .001. N = 3400. Sample weight applied = WK45T0. Age (K) = age of child at kindergarten entry. ASD = Autism variable (0 = typically developing; 1 = autism). INT3 = Parental Intrusiveness at Wave 3.

Table 20

Hierarchical Linear Regression of Child Expressive Language Ability (Wave 2) and Autism on Peer Social Competence in Kindergarten

Wave 2	Peer Social Competence in Kindergarten	
	B	R <sup>2</sup>
Step 1		.089
Gender	-.227***	
Income	.026***	
Age (K)	.016***	
ASD	-.975***	
Step 2		.101
Gender	-.196***	
Income	.022***	
Age (K)	.016***	
ASD	-.845***	
LANG2	.341***	
Step 3		.103
Gender	-.197***	
Income	.023***	
Age (K)	.016***	
ASD	-1.045***	
LANG2	.325***	
ASD x LANG2	.941**	

Note: \*p < .05, \*\*p < .01, \*\*\*p < .001. N = 4250. Sample weight applied = WK45T0. Age (K) = age of child at kindergarten entry. ASD = Autism variable (0 = typically developing; 1 = autism). LANG2 = Child Expressive Language Ability at Wave 2.

Table 21

Hierarchical Linear Regression of Child Expressive Language Ability (Wave 3) and Autism on Peer Social Competence in Kindergarten

Wave 3	Peer Social Competence in Kindergarten	
	B	R <sup>2</sup>
Step 1		.083
Gender	-.220***	
Income	.026***	
Age (K)	.016***	
ASD	-.909***	
Step 2		.090
Gender	-.217***	
Income	.023***	
Age (K)	.016***	
ASD	-.815***	
LANG3	.419***	
Step 3		.093
Gender	-.216***	
Income	.023***	
Age (K)	.016***	
ASD	-1.474***	
LANG3	.355**	
ASD x LANG3	1.054*	

Note: \*p < .05, \*\*p < .01, \*\*\*p < .001. N = 4050. Sample weight applied = WK45T0. Age (K) = age of child at kindergarten entry. ASD = Autism variable (0 = typically developing; 1 = autism). LANG3 = Child Expressive Language Ability at Wave 3.

Table 22

Hierarchical Linear Regression of Parental Sensitivity (Wave 2), Child Expressive Language Ability (Wave 2), and Autism on Peer Social Competence in Kindergarten

Wave 2	Peer Social Competence in Kindergarten	
	B	R <sup>2</sup>
Step 1		.084
Gender	-.237***	
Income	.026***	
Age (K)	.016***	
ASD	-.861***	
Step 2		.099
Gender	-.202***	
Income	.021***	
Age (K)	.017***	
ASD	-.735**	
SEN2	.005	
LANG2	.363***	
Step 3		.100
Gender	-.203***	
Income	.021***	
Age (K)	.017***	
ASD	-.738**	
SEN2	-.046	
LANG2	-.051	
SEN2 x LANG2	.087	
Step 4		.101
Gender	-.204***	
Income	.021***	
Age (K)	.017***	
ASD	-.784	
SEN2	-.046	
LANG2	-.054	
SEN2 x LANG2	.086	
ASD x SEN2	-.015	
ASD x LANG2	-.922	
ASD x SEN2 x LANG2	.273	

Note: \*p < .05, \*\*p < .01, \*\*\*p < .001. N = 3400. Sample weight applied = WK45T0. Age (K) = age of child at kindergarten entry. ASD = Autism variable (0 = typically developing; 1 = autism). SEN2 = Parental Sensitivity at wave 2. LANG2 = Expressive Language (mean) score at wave 2.



Table 23

Hierarchical Linear Regression of Parental Emotional Supportiveness (Wave 3), Child Expressive Language Ability (Wave 3), and Autism on Peer Social Competence in Kindergarten

Wave 3	Peer Social Competence in Kindergarten	
	B	R <sup>2</sup>
Step 1		.067
Gender	-.218***	
Income	.025***	
Age (K)	.016***	
ASD	-.742**	
Step 2		.074
Gender	-.215***	
Income	.022***	
Age (K)	.016***	
ASD	-.686*	
EMSPT3	-.006	
LANG3	.400**	
Step 3		.074
Gender	-.215***	
Income	.022***	
Age (K)	.016***	
ASD	-.686*	
EMSPT3	-.002	
LANG3	.419	
EMSPT3 x LANG3	-.005	
Step 4		.076
Gender	-.215***	
Income	.022***	
Age (K)	.016***	
ASD	-.833	
EMSPT3	.018	
LANG3	.484	
EMSPT3 x LANG3	-.029	
ASD x EMSPT3	-.155	
ASD x LANG3	-.167	
ASD x EMSPT3 x LANG3	.297	

Note: \*p < .05, \*\*p < .01, \*\*\*p < .001. N = 3400. Sample weight applied = WK45T0. Age (K) = age of child at kindergarten entry. ASD = Autism variable (0 = typically developing; 1 = autism). EMSPT3 = Parental Emotional Supportiveness at wave 3. LANG3 = Expressive Language (mean) score at wave 3.

Table 24

Hierarchical Linear Regression of Parental Stimulation of Cognitive Development (Wave 2), Child Expressive Language Ability (Wave 2), and Autism on Peer Social Competence in Kindergarten

Wave 2	Peer Social Competence in Kindergarten	
	B	R <sup>2</sup>
Step 1		.084
Gender	-.237***	
Income	.026***	
Age (K)	.016***	
ASD	-.861***	
Step 2		.099
Gender	-.201***	
Income	.021***	
Age (K)	.017***	
ASD	-.733**	
COG2	.005	
LANG2	.362***	
Step 3		.100
Gender	-.201***	
Income	.021***	
Age (K)	.016***	
ASD	-.725**	
COG2	.038	
LANG2	.582*	
COG2 x LANG2	-.054	
Step 4		.101
Gender	-.202***	
Income	.021***	
Age (K)	.016***	
ASD	-1.233	
COG 2	.030	
LANG2	.530*	
COG2 x LANG2	-.043	
ASD x COG2	.110	
ASD x LANG2	-.430	
ASD x COG2 x LANG2	.210	

Note: \*p < .05, \*\*p < .01, \*\*\*p < .001. N = 3400. Sample weight applied = WK45T0. Age (K) = age of child at kindergarten entry. ASD = Autism variable (0 = typically developing; 1 = autism). COG2 = Parental Stimulation of Cognitive Development at wave 2. LANG2 = Expressive Language (mean) score at wave 2.

Table 25

Hierarchical Linear Regression of Parental Stimulation of Cognitive Development (Wave 3), Child Expressive Language Ability (Wave 3), and Autism on Peer Social Competence in Kindergarten

Wave 3	Peer Social Competence in Kindergarten	
	B	R <sup>2</sup>
Step 1		.067
Gender	-.218***	
Income	.025***	
Age (K)	.016***	
ASD	-.742**	
Step 2		.075
Gender	-.216***	
Income	.018***	
Age (K)	.016***	
ASD	-.691**	
COG3	.031	
LANG3	.376**	
Step 3		.076
Gender	-.216***	
Income	.018***	
Age (K)	.016***	
ASD	-.692**	
COG3	.164	
LANG3	1.012	
COG3 x LANG3	-.159	
Step 4		.080
Gender	-.216***	
Income	.019***	
Age (K)	.016***	
ASD	-1.272	
COG3	.175	
LANG3	1.038	
COG3 x LANG3	-.176	
ASD x COG3	-.052	
ASD x LANG3	-.222	
ASD x COG3 x LANG3	.306	

Note: \*p < .05, \*\*p < .01, \*\*\*p < .001. N = 3400. Sample weight applied = WK45T0. Age (K) = age of child at kindergarten entry. ASD = Autism variable (0 = typically developing; 1 = autism). COG3 = Parental Stimulation of Cognitive Development at wave 3. LANG3 = Expressive Language (mean) score at wave 3.

Table 26

Hierarchical Linear Regression of Parental Intrusiveness (Wave 2), Child Expressive Language Ability (Wave 2), and Autism on Peer Social Competence in Kindergarten

Wave 2	Peer Social Competence in Kindergarten	
	B	R <sup>2</sup>
Step 1		.084
Gender	-.237***	
Income	.026***	
Age (K)	.016***	
ASD	-.861***	
Step 2		.100
Gender	-.200***	
Income	.020***	
Age (K)	.017***	
ASD	-.724**	
INT2	-.052*	
LANG2	.358***	
Step 3		.101
Gender	-.201***	
Income	.020***	
Age (K)	.017***	
ASD	-.739**	
INT2	.005	
LANG2	.485***	
INT2 x LANG2	-.107	
Step 4		.102
Gender	-.202***	
Income	.020***	
Age (K)	.017***	
ASD	-1.221	
INT2	.001	
LANG2	.465***	
INT2 x LANG2	-.099	
ASD x INT2	.259	
ASD x LANG2	4.119	
ASD x INT2 x LANG2	-3.311	

Note: \*p < .05, \*\*p < .01, \*\*\*p < .001. N = 3400. Sample weight applied = WK45T0. Age (K) = age of child at kindergarten entry. ASD = Autism variable (0 = typically developing; 1 = autism). INT2 = Parental Intrusiveness at wave 2. LANG2 = Expressive Language (mean) score at wave 2.

Table 27

Hierarchical Linear Regression of Parental Intrusiveness (Wave 3), Child Expressive Language Ability (Wave 3), and Autism on Peer Social Competence in Kindergarten

Wave 3	Peer Social Competence in Kindergarten	
	B	R <sup>2</sup>
Step 1		.067
Gender	-.217***	
Income	.025***	
Age (K)	.016***	
ASD	-.741**	
Step 2		.076
Gender	-.212***	
Income	.020***	
Age (K)	.017***	
ASD	-.673*	
INT3	-.040*	
LANG3	.387**	
Step 3		.076
Gender	-.212***	
Income	.020***	
Age (K)	.017***	
ASD	-.677*	
INT3	-.001	
LANG3	.459*	
INT3 x LANG3	-.047	
Step 4		.078
Gender	-.212***	
Income	.020***	
Age (K)	.017***	
ASD	-2.570	
INT3	.005	
LANG3	.425*	
INT3 x LANG3	-.051	
ASD x INT3	.683	
ASD x LANG3	2.840	
ASD x INT3 x LANG3	-1.108	

Note: \*p < .05, \*\*p < .01, \*\*\*p < .001. N = 3400. Sample weight applied = WK45T0. Age (K) = age of child at kindergarten entry. ASD = Autism variable (0 = typically developing; 1 = autism). INT3 = Parental Intrusiveness at wave 3. LANG3 = Expressive Language (mean) score at wave 3.

Figure 1

Interaction of Parental Stimulation of Cognitive Development (Wave 3) and Autism Diagnosis on Peer Social Competence in Kindergarten

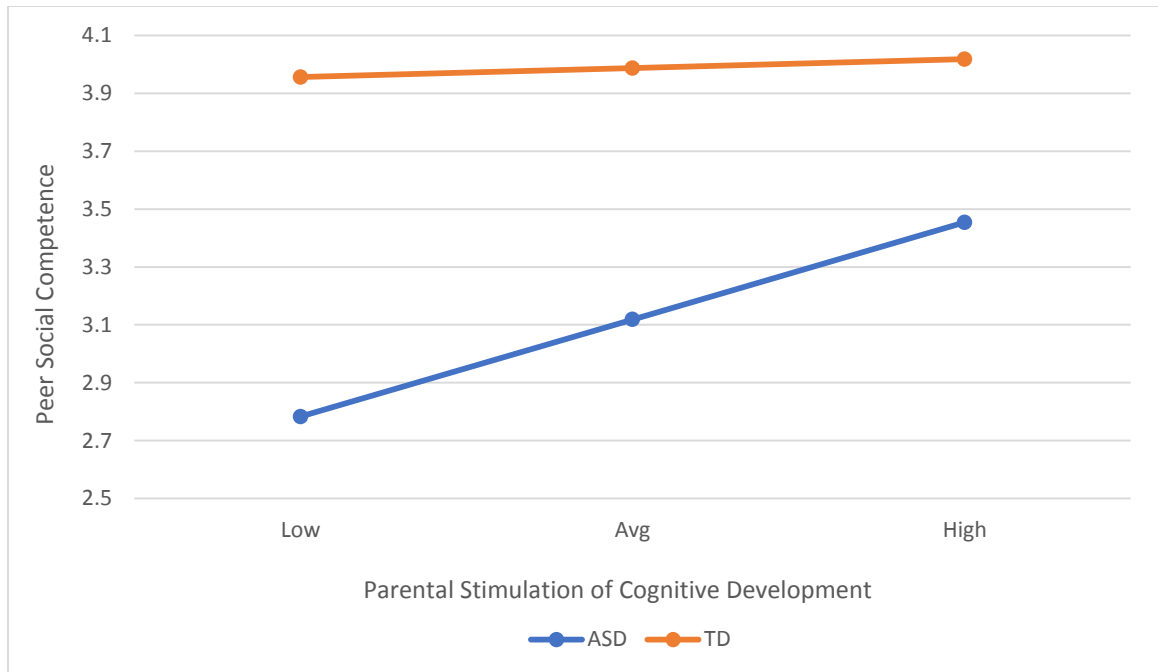


Figure 2

Interaction of Child Expressive Language Ability (Wave 2) and Autism Diagnosis on Peer Social Competence in Kindergarten

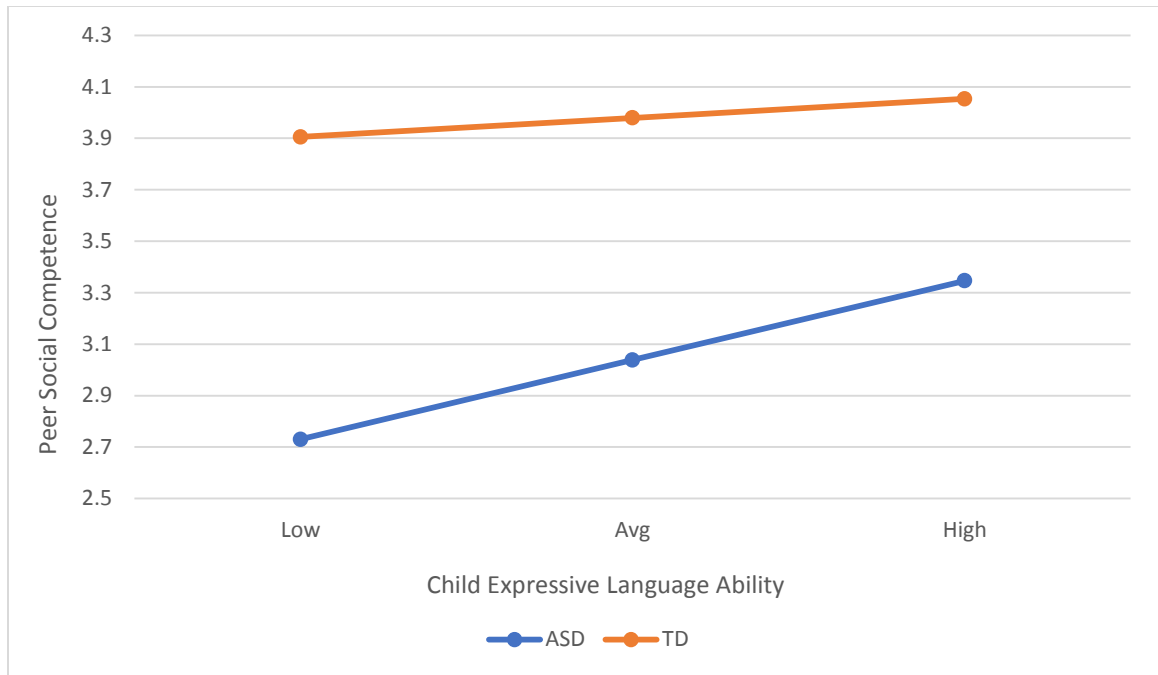


Figure 3

Interaction of Child Expressive Language Ability (Wave 3) and Autism Diagnosis on Peer Social Competence in Kindergarten

