THE IMPACT OF PARENT-CHILD FACTORS ON THE PLAY ABILITIES OF CHILDREN DIAGNOSED WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER, AUTISM SPECTRUM DISORDER AND SPEECH LANGUAGE IMPAIRMENT

by

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The impact of parent-child factors on the play of abilities of children diagnosed with Attention-Deficit/Hyperactivity Disorder, Autism Spectrum Disorder and Speech Language Impairment

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Abstract

Play is a key arena for the development of children’s cognitive, problem solving, motor, social, linguistic, and emotional skills. The observation of independent play in children with ADHD, ASD, and SLI provides a window into the developmental and play deficits that these children exhibit. Parents have a unique opportunity to enhance their children’s cognitive development in the nonthreatening arena of play. This study examined differences in independent and parent-child play of children who are typical and developmentally disabled. Comparison was made on five-minute samples of parent-child play and independent child play using APS-P and the PCPS. A difference between independent and parent-child play was obtained. Parent negative temperament differed across diagnostic group, with parents of children in the SLI+ADHD group being more directive than other parents. Parent temperament and ASD group membership predicted play quality during independent play. Findings highlight the impact of parent factors on child play.
Introduction

The Importance of Play

Play is arguably the most prominent waking activity of typically developing preschool children (Sutton-Smith, 1976). Through play, children find an outlet for the expression of creativity and can develop cognitive processes associated with creativity and imagination (Russ, Robins & Christiano, 1999). It provides children a safe arena in which to problem solve, fantasize, and plan strategies. Play is an effective medium to develop fine and gross motor skills, as well as social and behavioral skills. Play may also facilitate the development of emotional skills and the identification of emotions, in that it allows practice through play scripts and the use of toys as actors. Additionally, play provides a way to verbalize and express a child’s unique perspective of the world (Hughes, 1999; Piaget, 1962; Vygotsky, 1986). Cognitively, play provides children with an opportunity to practice and refine language and communication skills.

Developmental theorists argue that play develops sequentially, moving from simplistic, functional, and rigid play activities to activities that are more complex, flexible, generalized, and increasingly symbolic (Bretherton, 1984; McCune-Nicolich, 1977; Piaget, 1962; Watson & Fischer, 1977). These changes typically occur during a developmental window from 12 months to 36 months of age, with pretend play generally appearing by the age of 18 months (McCune-Nicolich, 1977).

Piaget (1962) provided much of the early theoretical work on play, with his presentation centering on a detailed developmental sequence. He theorized that the initial play of young children is sensorimotor in nature. It is restricted to manipulation of an object and allows children to master simplistic action schemas. Sensorimotor or
functional play is followed by symbolic or pretend play, which is characterized by the use of objects as representations of real life or fantastical objects, characters, and events. Piaget further argued that symbolic play requires the ability to understand and differentiate between a symbol and what it symbolizes. Consequently, he postulated that symbolic play can act as a window into the representational abilities of the young child. According to Piaget, the final play stage encompasses a child’s ability to engage in rule-governed play, with this form of play occurring in the concrete operational stage.

McCune-Nicolich (1977, 1981) elaborated on Piaget’s work (1962) and created a model of the developmental sequence of play. In his first stage called Presymbolic Schemes, play is characterized by sensorimotor actions that conform to the true functions of objects. Children then move into an Autosymbolic Schemes stage during which the child first begins to exhibit symbolic behaviors in an attempt to play. Next, Decentered Symbolic Games emerge and enable children to reference other individuals when creating play scripts. The child’s play abilities culminate during the Combinatorial Symbolic Games and Internally Directed Symbolic Games stages. During these stages, children are able to fully engage in symbolic play while playing independently and with others.

In addition to the influence of a child’s developmental stage, play ability can be strongly impacted by the presence of a developmental disorder. In an effort to understand the relationship between developmental disorders and their impact on the development of play skills, numerous investigations have examined individual differences in the play of children diagnosed with a variety of developmental disorders including ADHD, ASD, and SLI.
ADHD and Play

ADHD is one of the most prevalent childhood mental health disorders affecting 3-7% of all school-age children (Barkley, 2005; DSM-IV-TR, [APA], 2000). ADHD has been described as a deficit in the executive function skills, which is presumed to dramatically affect self-control (Swanson, Harris, & Graham, 2003). Lack of self-control may result in the mismanagement of attention skills, greater impulsivity, and hyperactive behavior (Lerner, 2006).

To meet criteria for ADHD diagnostically, children must exhibit six symptoms of inattention, six symptoms of hyperactivity-impulsivity, or a combination of both. Inattention symptoms include inability to pay attention to details or listen closely, propensity to make mistakes, and forgetfulness. Hyperactivity-impulsivity symptoms include fidgeting, excessive talking, and impatience. Symptoms must be present for six months or more and “to a degree that is maladaptive and inconsistent with developmental level” (DSM-IV-TR; [APA], 2000). These characteristics must have been present before the age of 7 and they must affect at least two or more domains of a child’s life, while not existing solely during the episodes of another psychological disorder. The diagnosis of ADHD has been conceptualized to comprise three subtypes: ADHD-IA, for children who are primarily inattentive (5% of the ADHD population); ADHD-HI, for children who are primarily hyperactive (15% of the ADHD population); and ADHD-C, which is a combination of ADHD-IA and ADHD-HI (80% of the ADHD population) (DSM-IV-TR; [APA], 2000).

While the vast majority of studies investigating the play skills of children with ADHD have been intervention studies addressing medication and behavioral
interventions, early research investigated the relationship between ADHD symptoms and play skills. Schleifer, Weiss, Cohen, Elman, Cvejic, and Kruger (1975) compared the nursery behavior of hyperactive children of normal intelligence to matched control children. They found that attentional impairments were correlated with an increased frequency of activity shifting during free play activities (Schleifer et al., 1975). Children with ADHD also exhibited difficulty sustaining attention during structured play activities (Campbell, 1987).

Inspired by these early findings, Alessandri (1992) developed one of the key studies of ADHD and play ability. He hypothesized that young children with ADHD would exhibit 1) less sustained play than typically functioning children; 2) more disruptive behavior when asked to transition between activities than typically functioning children; and 3) less mature play than their non-ADHD peers due to attentional control deficits. Using a matched (gender, race, and IQ) sample of 20 ADHD preschoolers and 20 controls, Alessandri coded a 60-minute free play session. Analyses revealed that the ADHD group demonstrated less play and increased off-task transition behavior during the 60-minute sample than did the control group. The cognitive play of those with ADHD was less developed than that of the control group and consisted of more functional or sensorimotor play than symbolic play. The ADHD group also evidenced a social deficit when compared to the control group such that their social play was less parallel, more independent, and less compliant. The play deficits demonstrated by the children with ADHD in this study appear to be directly related to their attentional and impulsivity problems.
Cordier, Bundy, Hocking, and Einfeld (2009) provided additional support for Alessandri’s hypothesis that social deficits have an impact on the play of children with ADHD. Comparisons were made on the play skills of 112 children diagnosed with ADHD and 112 typically functioning children (5-10 years old) during 20 minutes of free play in a playroom setting. Their results indicated that although children diagnosed with ADHD sought social interactions as much as their typically functioning peers, they were less engaged and skillful during the interactions. In addition, the authors argued that children with ADHD were unable to identify and share affect with their peers during social interactions.

A more detailed examination of these data allowed for an investigation of the impact of subtype on social skills deficits in this sample (Cordier et al., 2010). It was found that children diagnosed with ADHD-IA had more difficulty engaging in play but had less difficulty during social interactions than children diagnosed with the ADHD-C and ADHD-HI subtypes.

**ASD and Play**

ASD is characterized by a deficit in social relatedness (DSM-IV-TR; [APA], 2000). These children have significant and continuous social skills impairments that may include an inability to develop relationships with peers, as well as impairment in the expression and processing of nonverbal behaviors (DSM-IV-TR; [APA], 2000). Although some children with ASD may long for social connectedness, social isolation is a common scenario due to their social and nonverbal deficits. Other children perceive their rigidity and inability to follow the rules of social interaction with annoyance (Fattig, 2008). Children with ASD also present restricted and repetitive patterns of behavior,
interest, and activities. Language or cognitive deficits are a final characteristic of ASD and can range from minimal impairment to mental retardation and lack of speech.

A wide range of research has assessed the play skills of children with ASD (Holmes, & Willoughby, 2005; Rutherford, Young, Hepburn, & Rogers, 2007; Stanley & Konstantareas, 2007). Play skills are so significantly affected by the presence of ASD that a lack of symbolic or imaginative play is one of the diagnostic criteria for Autistic Disorder in the DSM-IV-TR ([APA], 2000).

Findings from the study of play and ASD have indicated that a variety of play deficits are typical in children with autism. In general, children with ASD tend to exhibit play that can be best described as simple, repetitive, and stereotypical (Jarold, Boucher, & Smith, 1993). Children with ASD engage in lower frequency and less novelty of play than typically developing peers (Rutherford et al., 2007). In particular, children with ASD use dolls or stuffed animals as actors in their play less frequently than typically developing children or children with other developmental disorders (DSM-IV-TR, [APA], 2000). An investigation of children with autism who had verbal and nonverbal IQs that fell in the average range found that this symbolic play deficit is independent of IQ level (Wing, Gould, Yeates, & Brierley, 1977). Those with autism also engage in pretend play less regularly than typically functioning or clinical populations (Baron-Cohen, 1987; Bernabei, Camaioni & Levi, 1999; Doherty & Rosenfeld, 1984; Gould, 1986; Ungerer and Sigman, 1981; Wing et al., 1977, Sigman, 1998). Furthermore, the frequency of spontaneous pretend play in children with autism is less than would be expected given the child’s mental age.
Investigators have attempted to determine mediating factors responsible for play differences in children with ASD when compared to typically functioning and developmentally disabled peers (Rutherford et al., 2007). By comparing the independent and scaffolded play of children with autism, children with other developmental disorders, and typically developing children over a two year period, Rutherford and colleagues were able to isolate the causes of changes in play skills that emerged over time. A child’s diagnosis proved to be the strongest predictor of all forms (functional and symbolic) of play ability. In terms of symbolic play, joint attention, as measured by a frequency count of initiating and responding to joint attention, was found to be a significant predictor of spontaneous symbolic play. This indicates that the play deficits observed within the autistic population may be due to difficulties with social reciprocity and shared affect. Hobson (2002) developed a theory that echoes these findings. His theory posits that social reciprocity and shared affect are key components in the development of symbolic play skills.

An alternative hypothesis for the play differences seen in the study by Rutherford et al. (2007) is that language deficits are related to differences in play. This hypothesis was untested, however as the authors did not control for language ability.

**SLI and Play**

SLI is one of the most common developmental disabilities affecting young children (Tallal, 1988). The category of language delay encompasses a variety of specific disorders. Speech Sound Disorder (SSD) is characterized by errors in articulation, phonetic structure, and/or phonology due to a misapplication of linguistic skills (Campbell et al., 2003). It is typically observed during the preschool period and affects
15.6% of children under 3 years. The majority of children with SSD will overcome it through natural development or speech and language interventions such that only 3.8% of children are still diagnosed with SSD at 6 years (Campbell et al., 2003). Speech Language Impairment (SLI) is characterized by deficits in language expression and comprehension. It occurs later than SSD and is diagnosed in 6-8% of kindergarten-aged children (Tomblin, Records, Buckwalter, Zhang, Smith, & O’Brien, 1997). Children with SLI typically have normal nonverbal IQs and do not possess any deficits outside the realm of language (Tallal, 1988). SSD and SLI can occur in concert, with Combined SSD+SLI affecting 7% of all children (the SLI Consoritium, 2003; 2004; Johnson, Beitchman, Escobar et al., 1999).

Language and play appear to be strongly correlated, supporting Piaget’s (1962) proposition that they develop in a parallel fashion. The ability to process signs and symbols allows a child to develop mental imagery and create fantasy situations in pretend play. This same ability allows a child to use words symbolically. The hypothesized link between play and language development has been supported by a number of studies. Researchers found that children tend to say their first words at the time when they are also beginning to produce play and other symbolic gestures (Bates, 1976). Correlations between measures of syntactic development and a 2-year-old child’s ability to produce play schemes have also demonstrated the presence of a link between play and language (Bates, Bretherton, & Snyder, 1988).

As a result of the strong relationship between language and play, language impaired children would be expected to exhibit significant deficits in play ability when compared to their typically developing peers. In a study of the play skills of 2-year-olds
with expressive specific language impairment (SLI-E), Rescorla and Goossens (1992) observed less well-developed sequential play, fewer occurrences of symbolic play, less sophisticated simultaneous play, less complex play, and less decentered play (use of play schemes with a doll or another person) when compared to their typically developing peers. Rescorla and Goossens argued, however, that these findings in play may not be representative of a symbolic play deficit. Instead, these deficits were posited to be due to difficulty retrieving lexical and play action scripts critical to the production of pretend play. This difficulty reduces the motivation of a child with expressive language delay to talk and thus results in the perceived play deficits.

Casby (1997) elaborated on the findings of Rescorla and Goossens by reviewing the symbolic play abilities of older children (approximately 4:6 to 5:0). His review suggested that SLI children exhibit an impairment in their play skills that increases with age as compared to typically functioning children (Lombardino, Stein, Kricos, and Wolf 1986). An examination of the free play of children with language impairment found that only the oldest group (precise age ranges were not reported) of children differed from typically functioning children when measuring amount of time spent in symbolic play (Lovell, Hoyle, & Siddal, 1968). It was also found that the elder group of language impaired children demonstrated less complexity in play routines. A separate examination of deficits in terms of age found that the ability to use objects with set functional properties in imaginative ways only differed when comparing language impaired and typically functioning groups at older ages (5 years) (Brown, Redmond, Bass, Liebergott, & Swope, 1975).
Investigations into the play of SLI children have also attempted to investigate their play skills independent of language (Lombardino et al. 1986). Comparing mean-length-of-play sequences (MLPS) to mean-length-of-utterance (MLU), Lombardino et al. (1986) found that MLPS were higher than MLU in children with language impairment while MLU were higher than MLPS in the control group. This finding indicates that language impaired children do not verbalize their play as consistently or thoroughly as typically functioning children. Verbalization of play appears to have a significant impact on play level because, when researchers controlled for MLU, they found that differences in play complexity between groups were eliminated.

Casby’s review of the literature on SLI and play supports the work by Lombardino et al (1986) and contends that the play abilities of children with language impairments are not hindered by a symbolic play deficit. Instead, play skills of children with language impairments are affected by language retrieval difficulties. He argued that further research is needed due to the confounding nature of language impairment and play as well as the heterogeneity of language delay. Language delay can occur in concert with ADHD and play research has yet to investigate the play characteristics of children who have both SLI and ADHD (SLI+ADHD).

In response to the position that play differences are due to language impairment, Lewis, Boucher, Lupton, and Watson (2000) attempted to pinpoint the exact role of language impairment in play. They hypothesized that language plays a stronger role in symbolic play than in functional play and assessed the skills of 2- to 6-year-olds using the Test of Pretend Play (ToPP). After controlling for age, they determined that functional play and nonverbal ability were not significantly correlated with expressive and receptive
language skills while symbolic play was significantly correlated. These results support the retrieval difficulty hypothesis as nonverbal ability and functional play would be unaffected by a retrieval deficit while symbolic play would be affected.

**Parent-Child Task-Directed Interaction**

Since children do not develop in isolation, a number of investigations have attempted to conceptualize and study the impact of external factors on the development of children. Examining parent-child interaction has the potential to better understand the development and expression of play skills in children. Parenting factors have been found to affect children’s cognitive performance in problem-solving tasks, academic achievement, socio-emotional adaptation, and motivation (O'Connor, 2002; Maccoby, 1992). Parental affection and control styles are particularly strong predictors within these areas. More specifically, research from the field of attachment has demonstrated that secure parent-child attachment, characterized by maternal sensitivity, responsiveness, emotional warmth, and appropriate limit setting predicts a child’s academic and cognitive performance, emotional self-regulation, and motivational autonomy (Aunola & Nurmi, 2004; Freund, 1990; Ginsburg & Bronstein, 1993; Hokoda & Fincham, 1995; Isabella & Belsky, 1991; Juntila, Vauras, & Laakkonen, 2006; Low, 2003; Neitzel & Stright, 2003; Spinrad, Stifter, Donelan-McCall, & Turner, 2004; Wakschlag & Hans, 1999; Winsler, 1998). Conversely, insecure attachment, characterized by maternal unresponsiveness, insensitivity, over-directiveness, intrusiveness, and harshness, tends to have a negative impact on cognitive and emotional self-regulation as well as academic outcomes.

The quality of the parent-child relationship has also been examined on the level of interaction characteristics and is particularly important during scaffolding activities such
as play (Salonen, Lepola, & Vaurus, 2007). According to Vygotsky (1986), scaffolding by a parent helps the child into the zone of proximal development thereby allowing the child to reach a higher level of development than he would have been able to reach independently. In this process, the parent and the child impact each other and modify the social context of the task. During scaffolding, the parent and child are involved in a transfer of responsibility for learning. The child is initially dependent upon the parent for knowledge and motivation but with time and experience, the responsibility gradually shifts such that the child learns to self-regulate cognitively and motivationally (Meichenbaum & Biemiller, 1998).

In well-functioning parent-child dyads, scaffolding is typically adjusted by the parent depending on the child’s developmental level and independent functioning. This is termed contingent shifting and involves a parent changing task demands and varying the amount and type of assistance provided (Stone, 1998). More directive assistance and task structuring are appropriate if the child is heavily dependent on the parent while less directive assistance and task structuring should be given if the child is capable of independent functioning. It is critical that parents maximize a child’s independence by providing the least amount of directiveness necessary during the scaffolding relationship (Lepper, 1981). Doing so creates a gap between the child’s independent level and his potential level that the child can then cross with as little parental assistance as necessary. Thus the child is “pulled” to a higher level of independence and ability (Rogoff & Gardner, 1984)

During scaffolder parent-child interactions, the parent must be able to be sensitive to the child’s affective state during the learning enterprise and respond accordingly.
In optimal scaffolded interactions, the parent regulates the child’s emotion by matching positive child affect with positive affect (Dix, 1991). This regulation is in accordance with the “goodness of fit” theory developed by Thomas and Chess (1977). The goodness of fit theory, derived from studies of temperament, posits that parental demands and behaviors that match with a child’s abilities and temperament result in more positive psychological outcomes than parent-child mismatches. Dix (1991) further argued that parents engaging in optimal scaffolding will counteract negative child affect with positive affect and address neutral affect with neutral or positive affect.

Another important aspect of a successful scaffolding relationship is that the parent matches the verbalized expectations and causal attributions of the child (Hokoda & Fincham, 1995). The provision of positive support by the parent has been demonstrated to enhance the motivation of the child. If the child verbalizes negative expectations and attributions, an expression of support from the parent results in increased child motivation. Positive parental support is also beneficial if the child verbalizes a positive self-attribution or expectation, particularly during a challenging task.

Dysfunctional parent-child dyads evidence several differences during scaffolding tasks. One dysfunctional strategy exhibited by parents is to employ misplaced (i.e. redirecting a child’s actions without cause, interrupting a child’s actions) or controlling behavior (i.e. making choices for the child, directing the play), with this style of behavior not designed to withdraw control when the child becomes increasingly independent. The parent may also be under-directive and provide instructions that are too vague. These parents tend to be intrusive (disrupting a child’s activity leading to inhibition or
disorganization of the child’s behavior), ineffective communicators, and use negative control strategies (Beauchaine et al., 2002; Brophy & Dunn, 2002; Pomerantz & Eaton, 2001; Pratt, Kerig, Cowan, & Cowan, 1988; Pratt, Green, MacVicar, & Bountrogian, 1992; Winsler, 1998).

Discrepancies also arise when comparing the emotional and motivational regulation tendencies of optimal scaffolding parents with those who are non-optimal (Salonen et al., 2007). Non-optimal parents are more likely to respond to negative and positive child affect with negative affect. They are also more likely to respond negatively to negative expectations or attributions of the child and are less likely to successfully modulate the child’s negative expectations (Hokoda & Fincham, 1995).

**Parent-Child Play**

Many of the same qualities of parent-child interactions during scaffolding activities can be evidenced in parent-child play. Play between a parent and an infant has been found to provide an arena for the development of affect regulation, as well as social and cognitive skills (Tamis-LeMonda, Uzgiris, & Borstein, 2002). In fact, Levine (1988) theorized that play is the critical contributor within the parent-child relationship to a child’s emotional, social, and cognitive development. Parent-child play, like scaffolding, is bidirectionally structured (McCune, Dipane, Fireoved, & Fleck, 1994). Child and maternal factors work together to form a distinctive parent-child interaction style. Qualities of this parent-child interaction style, such as directiveness, warmth, and affect then impact the play functions of the dyad and a number of aspects of the child’s development.
During infancy and progressing into childhood, parent-child play encourages the development of joint attention (Mundy & Willoughby, 1996). Joint attention in play occurs when a parent and a child are engaged with each other and then extend their attention to a toy. Through joint attention, the child engages with the parent’s play experience while simultaneously conveying his goals and affect with the object. This engagement teaches the child and his parent to identify, change, and respond to each other’s intentions effectively. Joint attention is thus a critical feature of social-emotional development.

Research investigating maternal-child play has identified several key factors that facilitate and inhibit joint attention. A mother who encourages her child to maintain his self-selected attentional focus during play is simultaneously encouraging her child to explore his play environment and be an active agent in his learning process (Smith, Landry, Miller-Loncar, & Swank, 1997). Maintaining behaviors (i.e. supporting comments, orienting gestures that continue the child’s current action), which encourage the child to continue or build upon his current action, have also been found to correlate with language development, increased exploratory play, and increased positive affect (Akhtar, Dunham, & Dunham, 1991). Redirecting behaviors occur when a mother attempts to move the child’s focus from one toy to another. Redirecting behaviors are theorized to be difficult for a child to accommodate because they force disengagement with a current object or action and then require re-engagement with a new object or action (Tomasello & Farrar, 1986). Consequently, redirecting behaviors are thought to be inhibitors of joint attention. These behaviors have been found to inhibit language expression and exploratory play (Tomasello & Farrar, 1986).
Just as emotional factors are critical during scaffolding, they are critical during play tasks. Emotional availability, which refers to the emotional expression and responsiveness of both members of the parent-child dyad, plays a key factor in emotional regulation and in attachment (Biringen & Robinson, 1991; Easterbrooks, Biesecker, & Lyons-Ruth, 2000). Maternal emotional availability is characterized by several factors: sensitivity, non-hostility, non-intrusiveness, and structuring of the task. If a child and a parent can be emotionally available to each other (i.e. warm, encouraging, and engaged), particularly during play tasks, this should create an opportunity for the child to learn positive ways to express and regulate emotional states (Easterbrooks et al., 2000).

Several parent characteristics that emerge during parent-child play have been shown to have an impact on a child’s social development. Verbal engagement of mothers with sons was positively correlated with child social relationships (MacDonald & Parke, 1984). Maternal directiveness was also positively correlated which child peer popularity, although paternal directiveness was negatively correlated. One explanation for these differences centered on degree of directiveness, with only a moderate degree of directiveness found to positively impact behavior. The parent’s ability to foster positive child affect in play was also correlated with peer popularity.

Parent-child play characteristics have also been shown to impact cognitive development, particularly symbolic play. Noll and Harding (2005) investigated parental behavior during play, with an eye for examining differences in options-promoting (encouraging and affirming, verbally or nonverbally, the child to maintain his current behavior) or options-limiting (discouraging and disapproving of a child’s actions) behaviors. Parent-child play that was characterized by options-promoting behaviors was
correlated with an increase in the frequency of symbolic play when compared to play in options-limiting interactions. These results indicate that parental support of a child’s actions during play encourages the child to maintain or extend the symbolic play to other toys. This is a particularly critical finding given the relationship between cognitive functioning and symbolic play.

**Parent-Child Play and Atypical Populations**

Very few studies have investigated the parent-child play interaction differences between children diagnosed with ADHD, ASD, or SLI (Elder, Valcante, Groce, Yarandi, & Carlton, 2002; Cunningham & Barkley, 1979). Of these studies, even fewer have utilized a typically functioning control group. In one of the strongest studies currently available, Cunningham and Barkley (1979) compared 15-minute unstructured mother-child play sessions of 20 hyperactive boys (5 to 12 years) to that of 20 typically functioning dyads. Mothers of hyperactive boys were significantly more controlling and directive of their children’s play than the control group. Mothers of hyperactive boys also spent significantly more time restructuring their son’s play and were less positive in their verbal responses than mothers of typically functioning boys. These mothers also initiated fewer social interactions with their sons and were less responsive to interactions initiated by their child. They tended to ignore or respond negatively to interaction initiations, even when these initiations were viewed to be appropriate by observers in the study.

Additionally, Tamis-LeMonda and Dyssegaard (unpublished, cited in Tamis-LeMonda & Bornstein, 1996) found that the mothers of children who were low in play and language skills were less sensitive, flexible, and responsive than the mothers of
children who were high in play and language skills. Moreover, play levels decreased over time for the low group while they increased over time for the high group.

**Current Study**

Play has been found to be a key arena for the development of cognitive, motor, and social skills. Parents often take a central role in a child’s play and may consequently facilitate or hinder the development of these areas through parent-child interaction patterns. Consequently, it is critical to gain a deeper understanding of how differences in parent-child play may affect the development of children, both typically functioning and developmentally disabled. This knowledge could then have implications for a variety of clinical applications, including parent training, parent-child play therapy, and the assessment of typical and developmentally disabled children.

The parent-child play of children with ADHD, ASD, SLI, and SLI+ADHD has received relatively little attention thus far. The purpose of this study is to examine parent-child interaction factors during play and the impact of these factors on the development of play skills in atypical populations. It is this study’s aim to clarify differences between critical parent-child play and interaction variables between ADHD, ASD, SLI, SLI+ADHD, and typically functioning dyads. In addition, this study will identify factors that facilitate or inhibit successful play behaviors in these populations. To accomplish these aims, the following experimental questions will be addressed:

1) Does the parent-child play of ADHD, ASD, SLI, SLI+ADHD, and typically functioning children differ from their independent play on percentages of no play, functional play, and pretend play, as well as in terms of Likert ratings on imagination, organization, complexity-elaboration, and comfort?
• It is hypothesized that the parent-child play of these groups will score significantly higher on play quality variables when compared to independent play. Parent-child play will produce a higher proportion of symbolic play, increased comfort, increased imagination, more organized, and more elaborative play than independent play.

• It is further hypothesized that differences between ADHD, ASD, SLI, SLI+ADHD, and control groups will emerge when comparing the relationship of parent-child and independent play. In particular, it is hypothesized that ADHD, ASD, SLI, and SLI+ADHD dyads will show greater increases in play quality when comparing independent play to parent-child play than children in the typical group. This hypothesis is based on the premise that developmentally disabled children will perform more poorly in independent play as compared to typically functioning children thus the improvements of the developmentally disabled groups when scaffolded by a parent will be more pronounced.

2) Do parent-child factors (i.e. temperament, emotional availability, and interaction characteristics) differ across diagnostic groups?

• It is hypothesized that the ADHD, ASD, SLI, SLI+ADHD, and control groups will differ when comparing the characteristics of parents and children. It is thought that the parents of children with ADHD and SLI+ADHD will exhibit fewer positive interactions with their children than parents of children without ADHD due to problems of behavioral noncompliance. Parents of children with ADHD and SLI+ADHD will be more directive than parents of
any of the other groups of children as well due to these noncompliance issues. Additionally, parents of children with ASD, SLI, and SLI+ADHD will appear to be less emotionally available because of the communication incompetence of their children as compared to parents of children without communication problems.

3) Do parent characteristics evidenced during parent-child play (i.e. temperament, emotional availability, and interaction characteristics) predict children’s play ability as measured by no play, functional play, pretend play, imagination, organization, complexity-elaboration, and comfort? Do other factors, such as fluid intelligence (Gf) and diagnostic group membership, add to the predictive power of parent characteristics?

- It is hypothesized that temperament, emotional availability, and interaction characteristics will predict play quality during independent and parent-child play. It is further hypothesized that diagnostic group membership will be a significant predictor of play quality with ASD, SLI, and SLI+ADHD group membership predicting lower levels of play given their verbal difficulties. ADHD group membership will be a significant predictor of play quality as well due to issues of noncompliance. In addition, it is hypothesized that the fluid intelligence of participants will not have significant predictive power.

**Methods**

**Data Analysis Strategy**

Data were assessed using a variety of statistical tests. Chi-square analyses and analyses of variance (ANOVA) were used to identify demographical differences between
diagnostic groups. The PCPS and the APS-P were both assessed for inter-rater reliability with intraclass correlation coefficient statistics assessing absolute agreement using two-way mixed models. To address the first experimental question of diagnostic group differences in play, repeated measures analyses of variance (RM-ANOVA) were conducted. The second experimental question of differences in parent-child factors across diagnostic groups was investigated using multivariate (MANOVA) and univariate analyses of variance (ANOVA). In all analyses of variance, the Bonferroni correction was utilized to control for Type I errors. Although the PCPS was crafted to measure theoretical constructs of parent and child temperament (Q=14), emotional availability (Q=10), and parent-child interactions (Q=54) (Table 1), an exploratory factor analysis (FA) was conducted to determine the loadings of PCPS variables onto these factors. While FA was not a primary focus of the study, the large number of variables comprising the PCPS (Q=79) necessitated an investigation of more stable estimates of parent-child factors than could be provided by individual variables. Finally, the third experimental question regarding the influence of parent-child factors on independent play was assessed using linear regressions. Variables of interest included diagnostic group, Gf as measured by the Performance IQ score of the WPPSI-III, and PCPS factors.

**Participants**

The participants in this study were 53 children participating in a larger study of 77 children that investigated the cognitive, linguistic, attentional, and independent play abilities of children with developmental disorders. Developmentally disabled children and their parents were recruited through referrals from assessment and treatment facilities in the Cleveland area including the Cleveland Clinic and the Cleveland Speech &
Hearing Center. The children that formed the typical control group were a sample of convenience. Six children were siblings of developmentally disabled participants while ten were recruited from groups in the Cleveland community (equestrian competitions, elementary schools, and university employees). The siblings of developmentally disabled participants did not differ from their non-sibling counterparts on age, gender, Performance IQ, Processing Speed IQ, receptive language, or expressive language (as measured by the WPPSI-III and the CELF Preschool 2 respectively). As compensation for their participation, children received one inexpensive toy and parents received a short report of their child’s cognitive, linguistic, behavioral, and attentional skills. Children were between the ages of 4 and 7 (mean age= 5.9). Participants included 37 boys and 16 girls. Thirty-seven of the participants had been formally diagnosed by primary care providers using DSM-IV criteria prior to the study, with the remaining 16 children forming the control group. Diagnoses were as follows: 6 children had received a primary diagnosis of SLI, 14 had been diagnosed with ADHD, 9 children had received a primary diagnosis of ADHD and SLI, and 8 children had received a diagnosis of ASD. Forty-six participants (86.8%) were European-American, six (11.3%) were Black, and one (1.9%) was Hispanic-American.

**Demographics. (Table 2)**

Chi square analyses were conducted to examine demographic differences within the sample across diagnostic group. As expected, gender differences were obtained, \( \chi^2(4, N = 53) = 11.59, p = .01 \) with more females in the typical group (.63) than all other diagnostic groups (SLI = .17, ADHD = .14, ASD = .22, SLI+ADHD = .13). No
significant ethnic differences were found across diagnostic group, $\chi^2(8, N = 53) = 11.19$, $p = .157$.

Analysis of maternal education revealed significant differences across diagnostic group, $\chi^2(16, N = 53) = 32.37$, $p = .01$. Maternal education levels in the SLI+ADHD and SLI groups were more skewed towards the lower end (less than a high school diploma; high school diploma, some college) than for the other groups.

Chi-square analyses further revealed significant maternal occupation differences across diagnostic group $\chi^2(12, N = 53) = 28.67$, $p = .01$. The typical group had more mothers in professional occupations than all other diagnostic groups. In contrast, the SLI group had more mothers who were not employed than any other diagnostic group.

A univariate analysis of variance examined differences in age across diagnostic group. Significant differences did not emerge, $F(4, 48) = .524$, $p = .719$.

Measures

**Baseline Measures.**

Parents completed several questionnaires as part of their participation in a larger study. Diagnostic questionnaires given as part of the larger study were as follows: Medical-Social History Questionnaire, Phonology Subject Questionnaire, Adaptive Language Inventory (APL; Feagans & Farran, 1979), Conners Rating Scale-Parent Version (CRS-P; Conners, 1994), Gilliam Autism Rating Scale (GARS, Gilliam, 1995), and the Behavior Rating Inventory of Executive Function-Preschool Version (BRIEF-P; Gioia, Espy, & Isquith, 2003) Parents also completed the following questionnaires related to home and parent functioning: Impact on Family Scale (IFS; Stein & Jones, 1985) and COPE (Carber, Scheier, & Weintraub, 1989). Children’s functioning was
measured using the following assessments: Wechsler Preschool and Primary Scale of Intelligence-Third Edition (WPPSI-III) or the Wechsler Intelligence Scale for Children-Fourth Edition (WISC-IV), Clinical Evaluation of Language Fundamentals, Preschool 2 (CELF Preschool 2), Goldman Fristoe Test of Articulation 2 (GFTA-2), a 5 minute free language sample, and the Shape School (Espy, 1997).

Of these measures, the following were used in the current investigation: the WPPSI-III and the CELF Preschool 2 were used to assess for IQ level and verbal ability; the CRS-P and the GARS were used to clarify diagnosis.

**Independent Play.**

Independent play was assessed using the Affect in Play Scale-Preschool Version (APS-P) developed by Seja and Russ, (1999). The play session took place at a table in a lab setting, although children were allowed a small degree of mobility within the room. All children were presented with a standardized set of toys that included some functionally-defined toys (e.g. lion, car) and some objects that could be used more creatively (e.g. cups, ball). After briefly introducing the child to each of the toys in the set, the examiner demonstrated a standardized play script to the child using the toys: “Now we’re going to make up a story using the toys on the table. See how you can play with the toys. This is the bear. He says, ‘I’m really hungry! Where can I find some food? Oh look, I found some cookies. I love cookies. Yum! Yum! Here’s another cup. Oh yucky! I don’t like what’s inside there! Yuck!’” The child was then given the following standardized instructions: “Now you keep playing. What happens next? I’ll tell you when to stop. I’m going to do my homework now so you play by yourself.” Children were then given five minutes to play. Examiner prompts to child verbalizations
or behaviors during the play session were standardized and only given when necessary to maintain the child’s play or verbalizations or to inhibit inappropriate behavior. Examiners were instructed to participate as little as possible in the child’s session to ensure an accurate representation of independent play.

Play was videotaped, transcribed, and then scored by two independent raters using the APS-P scoring guidelines (see Appendix A for scoring form and manual). Positive, negative, and undifferentiated affect were recorded for each 10 second interval and the frequency of no play, functional play, or pretend (symbolic) play behaviors were recorded for each 20 second interval. Play was also scored using a scale of 1 to 5 on measures of comfort, imagination, organization, and elaboration. The number of themes, number of different themes, and the thematic content of the child’s play, was recorded. The number of redirections provided by the examiner was also noted.

The inter-rater reliability scores of this measure have been found in a previous study to be: imagination = .97, organization = .96, elaboration = .92, comfort = .94, number of no play intervals = .95, number of functional play intervals = .99, and number of pretend play intervals = .95. (Kaugers & Russ, 2009). Reliability in the present study for the two independent raters was assessed and found to be .94 for the entirety of the measure. Validity within non-clinical populations was previously assessed and the APS-P was found to be significantly correlated with teacher ratings of affect and children’s play (emotional expression, range of emotions, comfort in play, originality) (Kaugars & Russ, 2009).

**Parent-Child Play.**
To reduce practice-effects, the child completed executive function and language assessments between the independent and parent-child play sessions. The parent-child play session occurred in the same setting and with the same toys as the independent play session. In place of the independent play instructions and introduction to the toys, parents were provided with a standard prompt that they should play with their child as they would at home. The examiner then left the room and the parent-child play session began. The session lasted 5 minutes. Play was videotaped, transcribed, and then scored by two independent raters using the APS-P scoring guidelines. Inter-rater reliability of the APS-P for parent-child play was assessed and found to be .93 for the entirety of the measure.

Characteristics of the parent-child interaction during the session were also assessed by two independent raters using a 79-item measure designed by the authors (See Appendix B for scoring form and manual). The measure was designed to address the following theory-derived factors: positive and negative temperament, positive and negative emotional availability, and positive and negative interactions (see table 1 for the specific PCPS variables comprising each factor).

To address these factors, a number of characteristics and interaction styles were measured. Parent and child temperament (mood, approach, activity, intensity, distractibility, directiveness Q=14) and emotional availability (intrusiveness, engagement, encouragement, warmth, hostility; Q=10) were each measured using a 4-point scale. The following verbal and nonverbal interactions were investigated using frequency counts: total number of questions, total number of statements, total number of behaviors, praise, organizing, labeling, thought formation, elaboration, redirection (defined as
encouragement to return to play), and misdirection (defined as interrupting play or encouragement to discontinue play) (Q=48). Physical and eye contact were assessed using frequency counts as well (Q=4). Finally, verbal reciprocity in play was measured using frequency counts (Q=3).

The majority of items on the PCPS were derived from theoretical constructs in the literature. The authors sought to measure scaffolding behaviors such as directiveness, warmth, and affect as they were defined in previous studies of parent-child interactions (McCune et al., 1994). Drawing upon research by Smith and colleagues (1997), factors that inhibited and facilitated joint attention such as maintaining and redirecting behaviors were an additional focus when developing the measure. Assessing the emotional availability of mother and child was an aim of the measure and development of appropriate items was rooted in research by Easterbrooks and colleagues (2000). The PCPS was designed to address verbal engagement and directiveness as well due to their relationships to child social relationships (MacDonald & Parke, 1984). Items assessing options-promoting and options-limiting behaviors were created from Noll and Harding’s investigation of parental behavior during play (2005). Items assessing temperament were adapted from the mood, approach, activity, intensity, and distractibility scales used in a study of infant temperament by Seifer, Sameroff, Barrett, and Krafchuk (1994).

Inter-rater reliability was found to be .89 for the entirety of the measure.

Results

Data Cleaning

Given the small sample, and the increased likelihood of heterogeneity in samples of children with developmental delays, the data were examined for outliers. Outliers
were defined for the purposes of this study as participants who had scores on two or more variables of the APS-P that were further than 3 interquartile ranges from the middle 50 percent of the distribution. This definition resulted in the identification of one outlier. The outlier was a member of the typical control group. The removal of this participant from the sample altered the means of the pretend play and functional play percentages for the control group by 4.85%.

**IQ and Language Development Descriptives (Table 3)**

A multivariate analysis of cognitive ability, as measured by the WPPSI-III, revealed a significant diagnostic group difference, $F(8, 86) = 4.15, p = .001$, with univariate follow-up analyses revealing group effects for both Performance IQ, $F(4, 48) = 4.05, p = .01$, and Processing Speed IQ, $F(4, 48) = 7.40, p = .001$. Planned comparisons revealed that the SLI+ADHD group was significantly lower on Performance IQ when compared to the typical group. The SLI, ADHD, and ASD groups did not differ significantly from the other groups. Comparisons further revealed that, with the exception of the ADHD group, all other diagnostic groups had significantly lower processing speed scores than the typical group. In addition, the SLI and ASD groups had significantly lower processing speed scores than the ADHD group.

A MANOVA conducted on language ability, as measured by the CELF Preschool 2, revealed a significant difference across diagnostic group, $F(8, 78) = 3.54, p = .01$. Follow-up univariate analysis revealed that the significant difference persists on both Receptive Language, $F(4, 44) = 4.76, p = .01$, and Expressive Language, $F(4, 44) = 6.79, p = .001$. The typical group performed significantly higher than the ASD and SLI+ADHD groups on both receptive and expressive language scores. The ADHD and
SLI groups did not significantly differ from the other three groups.

**Analyses of Independent and Parent-Child Play Differences**

In order to address the first experimental question of differences between independent and parent-child play across diagnosis, RM-ANOVAs were conducted for APS-P variables with diagnostic group as a between subject variable and condition (independent versus parent-child play) as a within subject variable. Analyses were conducted on play percentages (no play, functional play, and pretend play percentages) and subsequently on the four APS-P play scales (imagination, organization, complexity-elaboration, comfort).

**APS-P Play Percentages. (Table 4)**

The RM-ANOVA on the percentage of no play revealed a significant diagnostic group effect, $F(4, 48) = 4.18, p = .01$, but no condition effect. Planned comparison analyses further revealed that the ASD group had a significantly higher percentage of no play across conditions than the SLI, ADHD, SLI+ADHD, and typical groups. No interaction effect was found.

The analysis involving the percentage of functional play revealed only a significant condition effect, $F(1, 48) = 9.18, p = .01$, with functional play reduced during the parent-child condition. No diagnostic group or interaction effect was obtained.

As predicted, the RM-ANOVA on the percentage of pretend play yielded both a significant diagnostic group effect and a condition effect, $(F(4, 48) = 2.93, p = .05$ and $F(1, 48) = 13.09, p = .001$ respectively). The ASD group had a significantly lower percentage of pretend play than the typical group, with the other groups not significantly
differing from each other. Additionally, pretend play increased during the parent-child condition as compared to the independent condition. No interaction effect was obtained.

In summary, as hypothesized, parents were found to be effective at decreasing the percentage of functional play while increasing the percentage of pretend play regardless of diagnosis. Furthermore, children diagnosed with ASD consistently demonstrated less developed play than their typical peers.

**APS-P Categorical Variables. (Table 5)**

The imagination RM-ANOVA revealed a significant diagnostic effect, $F(4, 48) = 2.74, p = .05$. Despite the fact that none of the pairwise comparisons of diagnostic group reached a conventional level of significance, the typical group had higher imagination scores when compared to the ASD group across conditions ($p = .08$). Significant differences were not found between any other groups. Additionally, as hypothesized, a significant condition effect was obtained, $F(1, 48) = 8.67, p = .01$, with imagination increased during parent-child play as compared to independent play. These main effects were complicated by a marginally significant interaction, $F(4, 48) = 2.35, p = .07$. In partial support of hypothesis one, the ASD group, followed by the SLI and typical groups, showed a greater increase in imagination when aided by a parent than the ADHD and SLI+ADHD groups (Figure 1).

RM-ANOVA conducted on the organization variable yielded a significant diagnostic group effect, $F(4, 48) = 2.833, p = .05$. While none of the pairwise comparison analyses of diagnostic group reached a conventional level of significance, the ASD group had lower organization scores across conditions when compared to the typical ($p = .06$) and the ADHD groups ($p = .068$). The other groups did not differ significantly from each
other. A significant condition effect was also revealed, $F(1, 48) = 6.67, p = .01$, with organization increased during the parent-child condition as compared to the independent condition. An interaction effect was not obtained.

Analysis of complexity-elaboration revealed a significant diagnostic group effect, $F(4, 48) = 2.93, p = .05$, with pairwise comparisons showing that the ASD group had significantly lower complexity-elaboration scores across conditions than the typical group while the other groups did not significantly differ from each other. In addition, a significant condition effect was revealed, $F(1, 48) = 7.866, p = .01$ with improvements in complexity-elaboration emerging during the parent-child condition when compared to the independent condition. RM-ANOVA further revealed that the main effects were complicated by a significant interaction, $F(4, 48) = 2.83, p = .05$, such that the scores for the ADHD group decreased when aided by a parent while the ASD group, followed by the SLI and typical groups, improved the most (Figure 2).

The comfort RM-ANOVA revealed a significant diagnostic group effect, $F(4, 48) = 4.20, p = .01$. Pairwise comparison analysis showed that the ASD group had significantly lower comfort scores than the typical and the ADHD groups across conditions. The other groups did not differ significantly from each other. A significant condition effect was also present $F(1, 48) = 16.59, p = .001$, with increased comfort scores found during parent-child play as compared to independent play. No interaction effect was obtained.

These findings as a whole suggest that parents were effective in facilitating the key play skills of imagination, organization, complexity-elaboration, and comfort. Additionally, children in the ASD group consistently evidenced the lowest levels of play
skills across both independent and parent-child play conditions while simultaneously showing the highest levels of improvement in imagination and complexity when assisted by a parent.

**Detailed Analyses of PCPS Variables (Table 6)**

**Analysis of Theory-Driven Composite Variables.**

To address the second experimental question of differences in parent-child factors across diagnostic groups, MANOVAs were conducted on the theory-derived composite PCPS variables (parent and child positive temperament, negative temperament, positive emotional availability, negative emotional availability, positive interactions, and negative interactions). ANOVAs were then conducted on the variables that comprised each composite PCPS variable (table 1) to further identify specific differences in parent-child characteristics across diagnostic groups.

**Parent Diagnostic Group Differences.**

Two MANOVAs (one for positive valence and one for negative valence) were performed on each of the three parental factors: temperament, emotional availability, and interactions. Only the analysis of negative temperament revealed significant diagnostic group differences, $F(12, 121) = 1.92, p = .05$. Univariate follow-up analyses of the variables comprising the negative temperament factor showed a significant diagnostic group difference in parent directiveness, $F(4, 48) = 3.97, p = .01$ with pairwise comparisons revealing that the parents of SLI+ADHD children were significantly more directive than the parents of typical children and children in the ADHD group.

**Child Diagnostic Group Differences.**
In terms of child PCPS factors, two MANOVAs (one each for negative and positive valence) were conducted on each child factor: temperament, emotional availability, and interactions. Analyses only revealed significant diagnostic group differences for child positive temperament, $F(16, 138) = 2.28, p = .01$, and child negative temperament, $F(12, 122) = 2.10, p = .05$. Follow-up ANOVAs of the variables comprising the child positive temperament factor showed a significant diagnostic group difference for approach, $F(4, 48) = 2.14, p = .05$. Pairwise comparisons further identified that children in the ADHD group were significantly more exploring in their approach to play than children in the ASD group. Univariate analyses of the variables within the child negative temperament factor revealed a significant diagnostic group difference for the child directiveness variable, $F(4, 48) = 5.04, p = .01$ with pairwise comparisons revealing that the children in the SLI+ADHD group were significantly less directive than the children in the ADHD, ASD, and typical groups. Although not significant, MANOVAs further revealed that diagnostic group differences for the positive emotional availability factor approached significance, $F(12, 122) = 1.76, p = .06$. Univariate follow-up analyses of the individual variables comprising positive emotional availability showed a significant difference in child emotional engagement, $F(4, 48) = 2.86, p = .05$ and a difference that approached significance in child warmth $F(4, 48) = 2.49, p = .06$. Pairwise comparison revealed that the typical group had significantly higher levels of child emotional engagement when compared to the SLI+ADHD group.

In sum, the negative temperament factor differed across diagnostic group for both parents and children, with the parents of children in the SLI+ADHD group being more directive than the parents of children in other groups. Additionally, the child positive
temperament factor proved important in understanding diagnostic group differences for the ADHD group.

**Predictive Power of PCPS Factors, Gf, and Diagnostic Group**

**Exploratory Factor Analysis.**

To address the third experimental question regarding the predictive utility of PCPS factors, fluid intelligence, and diagnostic group in understanding play differences, exploratory factor analyses and linear regressions were conducted. Although the number of participants in this study did not support the use of a factor analysis, exploratory factor analyses were conducted for parent and child variables separately to provide tentative conclusions regarding the legitimacy of the proposed theory-driven composite factors. An unrotated principal component analysis method was used. While a rotation method is typically used in exploratory factor analyses, an examination of the data revealed that an unrotated factor analysis was more supportive of theoretical constructs.

**Parent Factors. (Table 7)**

The analysis of the parent categorical variables of the PCPS, revealed three factors according to the Kaiser-Guttman criterion (eigenvalues greater than 1) that accounted for 68% of the variance. The factors were found to be somewhat similar to the theoretically-driven factors of the PCPS in that positive and negative characteristics were identified as underlying factors of the measure. While temperament was theorized as distinct from emotional availability, factors one and two represent a temperament variable that differs only in terms of valence (positive and negative). The factor analysis also revealed a third factor, which appeared to be tied to off-task behavior and distractibility.
**Child Factors. (Table 8)**

Findings were strikingly similar when analyzing the child categorical variables of the PCPS. Three factors were identified and found to account for 70% of the variance. The child PCPS variables loaded on the same factors as the parent PCPS variables, namely, positive characteristics, negative characteristics, and distractibility.

To summarize, exploratory factor analyses yielded three factors for both child and parent variables: positive temperament, negative temperament, and distractibility.

**Regression Models and Findings.**

A series of linear regressions were conducted to assess the predictive power of PCPS factors, fluid intelligence, and diagnostic group as predictors of independent and parent-child play characteristics. Performance IQ, as measured by the WPPSI-III was used as a measure of fluid intelligence and entered as the first block. The second block included diagnostic group dummy coded variables. The third block included the parent PCPS factors, as determined by exploratory factor analysis, with the regression scores obtained from the factor analysis utilized as the predictors.

**Parent Effects on Independent Play.**

Three linear regressions addressed what effect the independent variables (Gf, diagnostic group, and parent PCPS factors) had on independent play percentage scores (no play, functional play, and pretend play). A significant portion of the variance in the percentage of no play during the independent play condition was explained by the model, \( R^2 = .34, F(8,43) = 2.77, p = .02 \), with ASD group \( (B = 27.03, SE=6.8, p=.000) \) and parent positive temperament \( (B = -4.91, SE=2.2, p=.03) \) being significant predictors. The regression model for the percentage of functional play revealed no significant predictors.
A significant amount of the variance in pretend play was also explained by the regression model, $R^2 = .36$, $F(8,43) = 2.96$, $p = .01$, with ASD group being a significant predictor ($B = -.47.13$, SE=12.44 $p = .00$).

Four linear regressions addressed the effect of the independent variables (Gf, diagnostic group, and parent PCPS factors) on independent play categorical scores (imagination, organization, complexity-elaboration, and comfort). A significant proportion of the variance in imagination was accounted for by the model, $R^2 = .4$, $F(8,43) = 3.56$, $p = .003$, with ASD group ($B = -1.92$, SE=.5 $p = .000$) and parent negative temperament ($B = -.59$, SE=.19 $p = .003$) being significant predictors. A significant amount of the variance in organization scores was explained by the model as well, $R^2 = .39$, $F(8,43) = 3.42$, $p = .004$, with only ASD group being a significant predictor ($B = -1.8$, SE=.57 $p = .003$). In addition, a significant proportion of the variance in complexity-elaboration was accounted for by the regression model, $R^2 = .41$, $F(8,43) = 3.68$, $p = .002$, with ASD group ($B = -1.73$, SE=.51 $p = .001$) and parent negative temperament ($B = -.40$, SE=.19 $p = .04$) being significant predictors. Finally, a significant amount of the variance in comfort was explained by the regression model, $R^2 = .39$, $F(8,43) = 3.44$, $p = .004$, with ASD group ($B = -2.03$, SE=.48 $p = .000$) and parent negative temperament ($B = -.56$, SE=.18 $p = .003$) once again being significant predictors.

**Parent Effects on Parent-Child Play.**

The second series of linear regressions addressed what effect the independent variables (Gf, diagnostic group, and parent PCPS factors) had on parent-child play percentage (no play, functional play, and pretend play) and categorical (imagination, organization, complexity-elaboration, comfort) scores. The independent variables in the
regression model were not found to account for a significant portion of the variance in the percentage of no play, the percentage of functional play, the percentage of pretend play, imagination, organization, complexity-elaboration, or comfort.

In conclusion, ASD group membership and negative parent temperament were found to be consistent predictors of children’s play scores during independent play. In contrast, neither fluid intelligence, diagnostic group, nor parent factors were found to be significant predictors of children’s play scores during parent-child play. As a result of these findings, it appears as though, despite the absence of parents during independent play, the impact of parent style on child play is carried over into independent play settings.

Discussion
Support for Hypotheses
The current study investigated the differences between independent and parent-child play across a number of diagnostic groups (SLI, ADHD, SLI+ADHD, ASD, and typical control). In addition, differences in parent and child play characteristics across diagnostic group were examined, as well as the utility of parent factors as predictors of child play.

Differences Between Independent and Parent-Child Play.
The first hypothesis that the parent-child play of typically functioning and developmentally disabled children would result in significantly greater play quality when compared to independent play was supported. Parents of children in all diagnostic groups were effective in decreasing the time spent engaged in immature types of play (no play and functional play) while increasing symbolic pretend play, as compared to independent
play. Furthermore, the parents of children in the SLI, ASD, SLI+ADHD, and typical groups were effective in facilitating imagination, organization, complexity-elaboration, and comfort as compared to independent play. This is consistent with previous investigations of parent-child interactions and supports Vygotsky’s (1986) theory of scaffolding which postulate that parents can help children reach higher levels of development than they are able to reach independently (Salonen et al., 2007). Typically functioning children as well as children with ASD, SLI, SLI+ADHD were clearly able to reach a higher developmental level when assisted by a parent.

The additional hypothesis that developmentally disabled children would show greater increases in play quality than typically functioning children when comparing independent play to parent-child play was only partially supported, however. Instead, it was found that children in the ASD group improved the most when aided by a parent followed by the SLI and typical groups. Despite greater improvements in play by children in the ASD group, it should be noted that these children also evidenced the lowest levels of play skills across both independent and parent-child play conditions. These lower levels of play are consistent with previous studies, which identified a symbolic play deficit, difficulty with affect expression, poor social relatedness, and rigidity as characteristics of the play of the ASD population (Wing et al., 1977; Jarold et al., 1993).

The improvements seen in the play abilities of the children in the ASD group when playing with a parent may indicate that their parents provide scaffolding during play that encourages social reciprocity and affective expression. Simultaneously, given the strong relationship between play and language (Bates et al., 1988; Lewis et al., 2000),
it is likely that parents of children in the ASD group provide an integral verbal structure that children lack when they play independently. This explanation is supported by the fact that the SLI group evidenced similarly high levels of improvement when aided by a parent. Thus for children with SLI, parent-scaffolding of language may account for increases in play quality when playing with a parent, as compared to independent play. For the ASD group, parent scaffolding of language, social reciprocity, and affect may account for increases in play quality during the parent-child play condition.

While it was hypothesized that children in all developmentally disabled groups would surpass the typical group in the degree of improvement between the independent and parent-child conditions, children in the ADHD group evidenced lower levels of organization and complexity-elaboration when aided by a parent. Although it is unclear why the ADHD group was the only group that did not improve when aided by a parent, several explanations are plausible. First, Cordier et al. (2009; 2010) posited that children with ADHD evidence difficulty with social interactions when engaged in play as compared to typically functioning peers. This social deficit may consequently interfere with their ability to effectively utilize the scaffolding provided by a parent. Secondly, ADHD is characterized by a limited ability to attend to a specific stimulus for an extended period of time. It is possible that these children found their already limited ability to attend to the play activity even more taxed when they had to extend their attention to a parent. Even a parent who was providing effective scaffolding for his or her child may have inadvertently distracted the child from the task at hand. Finally, Cunningham and Barkley (1979) found that mothers of hyperactive boys were significantly more controlling of play than parents of typical children, in part because
parents were responding to current and long-term patterns of child noncompliance. Although the PCPS was not designed to directly assess oppositionality, it is possible that parents of children with ADHD were responding to child noncompliance during parent-child play sessions with more controlling and rigid demands resulting in a lower quality of play. This explanation may similarly account for the relatively modest increases in play quality for the SLI+ADHD group when comparing independent to parent-child play, as the attentional and hyperactive symptoms of the population may have similarly led to noncompliant behaviors. Thus, behavioral problems in these diagnostic groups may be integrally responsible for the failure to improve when provided with parent-scaffolding during play, as opposed to this failure being the result of a symbolic play deficit.

**Diagnostic Group Differences in Parent and Child Characteristics.**

The second hypothesis that parent and child characteristics evidenced during parent-child play would differ across diagnostic groups was partially supported. Parent and child emotional availability and interaction characteristics were found to be similar regardless of group. In contrast, parents of children diagnosed with ADHD were previously found to exhibit more negative-reactive interaction statements and fewer positive characteristics (i.e. warmth, positive mood) than parents of typically functioning children (Johnston, 1996). Results are also in contrast to a study by Lasky and Klopp (1982) where it was found that the verbal and nonverbal communication patterns between children with language disorders and their parents significantly differed from those of normally developing children. The lack of differences in interaction characteristics and emotional availability in this study may be due to limited sample size. Alternatively,
similarities across groups may indicate that parent-child play is not an ideal arena for the observation of diagnostic differences in parent-child interactions.

Negative temperament was found to differ across groups, however, with parents of children in the SLI+ADHD groups being more directive than parents of children in other groups. This finding is similar to that of Cunningham and Barkley (1979), who found higher levels of directiveness during play for the parents of hyperactive boys. Furthermore, child positive temperament differed across groups with children in the ADHD group being more exploratory in their play approach than children in other groups. This is not unexpected given the hyperactivity diagnostic criteria of ADHD (DSM-IV-TR; [APA], 2000).

**Predictors of Independent and Parent-Child Play.**

Results were in partial support of the final hypothesis that parent characteristics and diagnostic group would predict children’s play abilities. In terms of independent play, parent positive temperament predicted a decrease in the percentage of no play while parent negative temperament predicted lower imagination, complexity-elaboration, and comfort scores. These positive temperament findings are somewhat consistent with Noll and Harding’s (2005) research, which identified a correlation between increased levels of symbolic play and options-promotion behaviors. At the same time, findings regarding negative temperament expand upon Noll and Harding’s correlation between options-limiting behaviors and a reduced frequency of symbolic play.

Additionally, ASD group membership predicted a higher percentage of no play and lower pretend play, imagination, organization, complexity/elaboration, and comfort
scores. These results were consistent with hypothesis one findings that the ASD group had the least developed play skills.

In line with our hypotheses, Gf had no effect on play abilities. This is consistent with previous research by Russ and Grossman-McKee (1990), which revealed that IQ is not significantly related to affect, comfort, quality, or imagination in play.

The pattern of results for the predictors of parent-child play was quite different from that of independent play. In terms of parent-child play, neither parent factors, diagnostic group, or Gf were found to be significant predictors of children’s play skills. Consequently, parent-child factors in this study were found to be stronger predictors of independent play than they were of parent-child play. A possible explanation for this finding is that parents can provide scaffolding during parent-child play that allows all children to reach a play level consistent with their peers, thus minimizing differences in play between diagnostic groups. When the parent is not present during a child’s play, however, the characteristics exhibited by the parent during parent-child play appear to carry over and impact the child’s play skills. This preliminary finding has important clinical implication, in that parents should be cautioned about their key role in the development of children’s play skills. One explanation for why parents appeared to have less of an impact on parent-child play may in part be the artificial nature of the task. It is feasible that parents did not display their natural patterns of play interaction during the parent-child play session because they knew they were being observed.

**Conclusions.**

In sum, this study found that the ASD followed by the SLI and typical groups improved the most in play quality when comparing independent to parent-child play. The
SLI+ADHD group demonstrated only a modest increase in play quality while the ADHD group was found to decrease in play quality in the presence of their parent. Furthermore, it was found that parent and child characteristics such as temperament, emotional availability, and interactions did not differ across diagnostic groups with the exception of positive and negative temperament. Finally, findings revealed ASD group membership and parent positive and negative temperament were significant predictors of independent child play quality.

Clinical Implications

This investigation sheds light on the critical role of parents in their children’s play skills. Parents of children with SLI, ASD, and SLI+ADHD diagnoses as well as the parents of typically functioning children were able to help their children reach a significantly higher level of play than could be achieved independently. Findings also highlight the enhancing effects of positive parent characteristics (i.e. warmth, engagement, encouragement) on the independent play of young children. Conversely, parents need to be particularly conscious of the detrimental effects that negative parent characteristics (i.e. hostility, intrusiveness, directiveness) have on children’s play abilities. Because play skills are integrally tied to a variety of developmental arenas, including cognition, social skills, imagination, problem solving, and fine and gross motor skills, it can be tentatively concluded that the parents of children with and without developmental disabilities are able to significantly enhance their children’s development through positive and supportive play. This conclusion supports the encouragement of positive parent characteristics in a number of therapy modalities such as parent-child play therapy and parent training.
One significant puzzle identified from the results of this study was that children with ADHD did not improve in play quality when aided by a parent. While the cause of this finding is unknown, attentional deficits, hyperactivity, and noncompliance may have interfered with the scaffolding relationship between parent and child. Attentional, hyperactive, and compliance difficulties may have similarly resulted in the relatively modest increases in play quality within the SLI+ADHD group when in the parent-child condition as compared to the independent condition. The possibility that behavioral noncompliance in these populations caused parents to be more controlling and engage in more options-limiting behaviors, resulting in a lower quality of play, supports previous research and has implications for parent training and parent-child play therapy in these populations.

Findings also add to the understanding of the play deficit seen in children with ASD. Although children with ASD evidenced difficulties with play across both independent and parent-child play conditions, effective parent scaffolding improved play performance significantly. This finding may indicate that social reciprocity and shared affect are more serious issues when playing with peers or when playing independently as children with ASD are then only provided with subtle social and affective cues. When playing with a skilled parent, however, social and affective cues may be more clear-cut and obvious. Similarly, parents can provide verbal scaffolding that allows a child with a verbal deficit to reach a higher level of play than they may have been able to reach independently. Data from our SLI group lends credence to this argument, with parents providing the verbal scaffolding that these children could not provide on their own. In sum, play deficits in the SLI population obtained in this study and in previous research
appears to be integrally tied to a language deficit while the deficit seen in the ASD population may be a function of multiple deficits including social reciprocity, affect, language, and symbolic play.

**Limitations**

One important limitation of this study was the small sample size. This is a common limitation in studies that investigate characteristics of a clinical population. The small sample size limited the utility of our factor analyses and reduced the overall power of all analyses. Additionally, the sample was composed of primarily Caucasian and middle-class participants, as recruitment was generally limited to a managed care sample. Future researchers should examine individual differences in play using a larger sample with a more diverse population to more fully address the play differences of individual diagnostic groups.

Secondly, play was improved under conditions of parent-child scaffolding and, while we would like to attribute this to the effectiveness of parent support, practice effects may have been operating as well. Independent play always preceded parent-child play in this study. Although we attempted to control for practice effects by inserting other assessment tasks between conditions, a counterbalanced experimental design was not used. This may be a particular concern given previous research by Christie, Johnson, and Peckover (1988) found a higher percentage of mature play in 30 minute play session when compared to 15 minute play sessions. While the design of Christie et al.’s (1988) study was largely different in terms of methodology, their results may indicate that the increases in play quality that we found when comparing the parent-child play condition to the independent play condition may not be due to parent scaffolding as we postulate.
Increases may instead be simply due to increased time at play. Future studies should address the impact of practice effects on play by utilizing a counterbalanced experimental design.

A final limitation of the present study concerns the use of a newly developed measure, the Parent-Child Play Scale. Although the PCPS was created based on a theoretical understanding of parent-child interactions, scaffolding, and play, it has yet to be validated empirically and its reliability has only been assessed in the current study. Had a gold standard measure of parent-child play characteristics been available for comparison purposes, we would have included both in an effort to validate the PCPS. No such gold standard measures were available thus validation was not possible. Use of the PCPS with a larger sample in future studies would be helpful in evaluating validity and further assessing reliability of this instrument.

**Future Directions**

In addition to addressing the limitations of the present study, an important future direction for play research is a study of the impact of language on the independent and parent-child play of children with developmental disabilities. Findings and hypotheses regarding the improvement of the ASD and SLI groups when aided by a parent already indicate that language may be a key deficit in the play of these children as well as a critical component of parent scaffolding. Future research may cement this relationship and provide a better understanding of the play deficits in the ASD, SLI, and SLI+ADHD populations.
Later researchers may also wish to further investigate the finding that the play skills of children with ADHD decreased when aided by a parent. While the PCPS may not have captured the social deficit, inattention, or noncompliant behaviors that resulted in this relationship, other measures may be more adept at identifying these factors in both the parent and the child and may consequently provide more insight into the interaction.

Finally, an intervention study based on the findings of the current investigation is recommended. A parent-child play intervention that fosters positive parent temperament while decreasing negative parent temperament may clarify the relationship between parent characteristics and independent play. Furthermore, this type of intervention would likely have implications for the field of parent-child therapy and parent training in general.
Table 1

*Theory-Driven PCPS Factors*

<table>
<thead>
<tr>
<th>Temperament</th>
<th>Emotional Availability</th>
<th>Interactions</th>
</tr>
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<tbody>
<tr>
<td>Positive (Q=8):</td>
<td>Positive (Q=6):</td>
<td>Positive (Q=48):</td>
</tr>
<tr>
<td>• Mood</td>
<td>• Engagement</td>
<td>• Praise</td>
</tr>
<tr>
<td>• Approach</td>
<td>• Encouragement</td>
<td>• Organizing</td>
</tr>
<tr>
<td>• Intensity</td>
<td>• Warmth</td>
<td>• Thought Formation</td>
</tr>
<tr>
<td>Negative (Q=6):</td>
<td>Negative (Q=4):</td>
<td>Elaboration</td>
</tr>
<tr>
<td>• Activity level</td>
<td>• Intrusiveness</td>
<td>Redirection</td>
</tr>
<tr>
<td>• Distractibility</td>
<td>• Hostility</td>
<td>Eye Contact</td>
</tr>
<tr>
<td>• Directiveness</td>
<td></td>
<td>Physical Contact</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reciprocity</td>
</tr>
<tr>
<td>Negative (Q=6):</td>
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<td>Misdirection</td>
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Table 2
Demographic Characteristics

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<th></th>
<th>SLI</th>
<th>ADHD</th>
<th>ASD</th>
<th>D</th>
<th>Typical</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n</strong></td>
<td>6</td>
<td>14</td>
<td>9</td>
<td>8</td>
<td>16</td>
<td>53</td>
</tr>
<tr>
<td><strong>Age (mean, SD)</strong></td>
<td>5.9 (.9)</td>
<td>6.2 (.8)</td>
<td>6.1 (1.1)</td>
<td>6.0 (1.1)</td>
<td>5.7 (1.2)</td>
<td>5.9 (1.0)</td>
</tr>
<tr>
<td><strong>Males * (n, %)</strong></td>
<td>5 (83.3)</td>
<td>12 (85.7)</td>
<td>7 (77.8)</td>
<td>7 (87.5)</td>
<td>6 (37.5)</td>
<td>37 (69.8)</td>
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<tr>
<td><strong>Ethnicity (n, %)</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Caucasian</td>
<td>5 (83.3)</td>
<td>11 (78.6)</td>
<td>9 (100.0)</td>
<td>5 (62.5)</td>
<td>16 (100.0)</td>
<td>46 (86.8)</td>
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<tr>
<td>Black</td>
<td>1 (16.7)</td>
<td>2 (14.3)</td>
<td>0 (0)</td>
<td>3 (37.5)</td>
<td>0 (0)</td>
<td>6 (11.3)</td>
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<tr>
<td>Hispanic-American</td>
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<td>1 (7.1)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1 (1.9)</td>
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<tr>
<td><strong>Maternal Education ** (n, %)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School Education &amp; Less</td>
<td>1 (16.7%)</td>
<td>2 (14.3%)</td>
<td>0 (0%)</td>
<td>3 (37.5%)</td>
<td>0 (0%)</td>
<td>6 (11.3%)</td>
</tr>
<tr>
<td>Some College</td>
<td>3 (50%)</td>
<td>4 (28.6%)</td>
<td>1 (11.1%)</td>
<td>4 (50.0%)</td>
<td>1 (6.2%)</td>
<td>13 (24.5%)</td>
</tr>
<tr>
<td>College Education &amp; Above</td>
<td>2 (33.3%)</td>
<td>8 (57.1%)</td>
<td>8 (88.9%)</td>
<td>1 (12.5%)</td>
<td>15 (93.8%)</td>
<td>34 (64.2%)</td>
</tr>
<tr>
<td><strong>Maternal Occupation ** (n, %)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Employed</td>
<td>3 (50.0%)</td>
<td>5 (35.7%)</td>
<td>3 (33.3%)</td>
<td>2 (25.0%)</td>
<td>2 (12.5%)</td>
<td>15 (28.3%)</td>
</tr>
<tr>
<td>Semi-Professional</td>
<td>2 (33.3%)</td>
<td>2 (14.3%)</td>
<td>1 (11.1%)</td>
<td>5 (62.5%)</td>
<td>1 (6.2%)</td>
<td>11 (20.8%)</td>
</tr>
<tr>
<td>Professional</td>
<td>1 (16.7%)</td>
<td>7 (50.0%)</td>
<td>5 (55.6%)</td>
<td>1 (12.5%)</td>
<td>13 (81.2%)</td>
<td>27 (50.9%)</td>
</tr>
</tbody>
</table>

*Note. *p < .05; **p < .01
Table 3

Diagnostic Group Differences in IQ and Language Development

<table>
<thead>
<tr>
<th></th>
<th>SLI</th>
<th>ADHD</th>
<th>ASD</th>
<th>SLI+ADHD</th>
<th>Typical</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance IQ (mean, SD)</td>
<td>105.4 (14.0)</td>
<td>108.9 (15.8)</td>
<td>100.2 (16.8)</td>
<td>95.5 (14.1)</td>
<td>117.75 (11.0)</td>
<td>4.05**</td>
</tr>
<tr>
<td>Processing Speed IQ (mean, SD)</td>
<td>83.8 (33.9)</td>
<td>108.1 (11.0)</td>
<td>83.7 (15.2)</td>
<td>90.3 (18.0)</td>
<td>114.6 (11.7)</td>
<td>7.40***</td>
</tr>
<tr>
<td>Receptive Language (mean, SD)</td>
<td>106.0 (16.6)</td>
<td>98.9 (9.4)</td>
<td>87.4 (13.5)</td>
<td>89.2 (18.7)</td>
<td>111.8 (16.1)</td>
<td>4.76**</td>
</tr>
<tr>
<td>Expressive Language (mean, SD)</td>
<td>98.0 (13.2)</td>
<td>102.7 (10.9)</td>
<td>87.3 (14.7)</td>
<td>88.8 (19.7)</td>
<td>112.6 (9.8)</td>
<td>6.79***</td>
</tr>
</tbody>
</table>

*Note. *p < .05;  **p < .01; ***p < .001
Table 4

Independent and Parent-Child Play Percentage Means

<table>
<thead>
<tr>
<th></th>
<th>SLI</th>
<th>ADHD</th>
<th>ASD</th>
<th>SLI+ADHD</th>
<th>Typical</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent Play</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Play</td>
<td>1.1 (2.7)</td>
<td>1.9 (3.1)</td>
<td>20.0 (34.2)</td>
<td>4.2 (11.8)</td>
<td>0.0 (0)</td>
</tr>
<tr>
<td>Functional Play</td>
<td>12.2 (21.7)</td>
<td>20.48 (29.3)</td>
<td>29.6 (34.7)</td>
<td>27.5 (26.3)</td>
<td>10.8 (13.7)</td>
</tr>
<tr>
<td>Pretend Play</td>
<td>86.7 (24.2)</td>
<td>77.6 (29.3)</td>
<td>50.4 (41.4)</td>
<td>67.5 (25.6)</td>
<td>89.2 (29.5)</td>
</tr>
<tr>
<td><strong>Parent-Child Play</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Play</td>
<td>1.1 (2.7)</td>
<td>1.4 (2.8)</td>
<td>3.7 (6.8)</td>
<td>0.0 (0)</td>
<td>0.4 (1.7)</td>
</tr>
<tr>
<td>Functional Play</td>
<td>7.8 (19.1)</td>
<td>7.1 (24.9)</td>
<td>9.6 (16.0)</td>
<td>7.5 (9.0)</td>
<td>6.7 (12.2)</td>
</tr>
<tr>
<td>Pretend Play</td>
<td>91.1 (21.8)</td>
<td>91.4 (26.6)</td>
<td>83.0 (18.9)</td>
<td>92.5 (9.0)</td>
<td>92.9 (12.0)</td>
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Table 5

*Independent and Parent-Child Play Categorical Variable Means*

<table>
<thead>
<tr>
<th></th>
<th>SLI</th>
<th>ADHD</th>
<th>ASD</th>
<th>SLI+ADHD</th>
<th>Typical</th>
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<tbody>
<tr>
<td><strong>Independent Play</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Imagination</td>
<td>3.8 (.8)</td>
<td>3.9 (1.1)</td>
<td>2.3 (1.2)</td>
<td>3.3 (1.0)</td>
<td>3.9 (1.1)</td>
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<tr>
<td>Organization</td>
<td>3.7 (1.2)</td>
<td>4.2 (.8)</td>
<td>2.1 (1.4)</td>
<td>3.0 (1.4)</td>
<td>3.9 (1.3)</td>
</tr>
<tr>
<td>Complexity-Elaboration</td>
<td>2.7 (.5)</td>
<td>3.7 (1.0)</td>
<td>1.8 (1.0)</td>
<td>2.8 (1.3)</td>
<td>3.6 (1.2)</td>
</tr>
<tr>
<td>Comfort</td>
<td>3.5 (.5)</td>
<td>3.6 (1.2)</td>
<td>2.2 (1.1)</td>
<td>3.8 (1.0)</td>
<td>3.4 (1.2)</td>
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<tr>
<td><strong>Parent-Child Play</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Imagination</td>
<td>4.5 (.5)</td>
<td>3.9 (1.5)</td>
<td>4.0 (.7)</td>
<td>3.5 (1.3)</td>
<td>4.4 (.8)</td>
</tr>
<tr>
<td>Organization</td>
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<td>4.0 (1.4)</td>
<td>3.9 (1.0)</td>
<td>3.9 (1.6)</td>
<td>4.3 (1.2)</td>
</tr>
<tr>
<td>Complexity-Elaboration</td>
<td>3.5 (1.4)</td>
<td>3.3 (1.6)</td>
<td>3.2 (1.2)</td>
<td>3.1 (1.5)</td>
<td>4.1 (1.1)</td>
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<tr>
<td>Comfort</td>
<td>4.5 (1.2)</td>
<td>4.4 (.9)</td>
<td>3.4 (1.2)</td>
<td>3.8 (1.2)</td>
<td>4.3 (.9)</td>
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Table 6

*Parent and Child PCPS Means*

<table>
<thead>
<tr>
<th></th>
<th>SLI (mean, SD)</th>
<th>ADHD (mean, SD)</th>
<th>ASD (mean, SD)</th>
<th>SLI+ADHD (mean, SD)</th>
<th>Typical (mean, SD)</th>
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</thead>
<tbody>
<tr>
<td><strong>Parent (mean, SD)</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Temperament</td>
<td>3.8 (.8)</td>
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<tr>
<td>Negative Temperament</td>
<td>3.7 (1.2)</td>
<td>4.2 (.8)</td>
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<tr>
<td>Positive Emotional</td>
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<td>1.8 (1.0)</td>
<td>2.8 (1.3)</td>
<td>3.6 (1.2)</td>
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<tr>
<td>Availability</td>
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<tr>
<td>Negative Emotional</td>
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<td>3.8 (1.0)</td>
<td>3.4 (1.2)</td>
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<tr>
<td><strong>Child (mean, SD)</strong></td>
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<td>Imagination</td>
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<td>4.0 (.7)</td>
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<td>Complexity-Elaboration</td>
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<td>4.1 (1.1)</td>
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<tr>
<td>Comfort</td>
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<td>4.4 (.9)</td>
<td>3.4 (1.2)</td>
<td>3.8 (1.2)</td>
<td>4.3 (.9)</td>
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Table 7

*Factor Loadings of Parent PCPS Variables*

<table>
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<tr>
<th></th>
<th>Positive Temperament</th>
<th>Negative Temperament</th>
<th>Distractibility</th>
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<tr>
<td>Mood</td>
<td>.712</td>
<td>-.484</td>
<td>-.015</td>
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<tr>
<td>Approach</td>
<td>.732</td>
<td>.141</td>
<td>-.030</td>
</tr>
<tr>
<td>Activity</td>
<td>.871</td>
<td>.197</td>
<td>.328</td>
</tr>
<tr>
<td>Intensity with toys</td>
<td>.767</td>
<td>.291</td>
<td>.175</td>
</tr>
<tr>
<td>Intensity with parent</td>
<td>.516</td>
<td>-.029</td>
<td>-.108</td>
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<tr>
<td>Distractibility</td>
<td>-.036</td>
<td>-.369</td>
<td>.571</td>
</tr>
<tr>
<td>Intrusiveness</td>
<td>.159</td>
<td>.798</td>
<td>.059</td>
</tr>
<tr>
<td>Engagement</td>
<td>.718</td>
<td>.132</td>
<td>.093</td>
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<tr>
<td>Encouragement</td>
<td>.612</td>
<td>-.312</td>
<td>-.235</td>
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<tr>
<td>Warmth</td>
<td>.719</td>
<td>-.166</td>
<td>-.315</td>
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<td>Hostility</td>
<td>-.267</td>
<td>.619</td>
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<tr>
<td>Directiveness</td>
<td>.150</td>
<td>.677</td>
<td>-.131</td>
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Table 8

*Factor Loadings of Child PCPS Variables*

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<td>Mood</td>
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<td>.068</td>
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<td>Activity</td>
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<td>.283</td>
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<td>.189</td>
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<td>Intensity with parent</td>
<td>.666</td>
<td>-.119</td>
<td>-.176</td>
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<td>-.239</td>
<td>.865</td>
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<td>.246</td>
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<td>-.097</td>
</tr>
<tr>
<td>Encouragement</td>
<td>.547</td>
<td>-.337</td>
<td>.016</td>
</tr>
<tr>
<td>Warmth</td>
<td>.404</td>
<td>-.504</td>
<td>-.105</td>
</tr>
<tr>
<td>Hostility</td>
<td>-.273</td>
<td>.481</td>
<td>.231</td>
</tr>
<tr>
<td>Directiveness</td>
<td>.351</td>
<td>.556</td>
<td>-.338</td>
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</table>
Figure 1. Independent and Parent-Child Play Imagination Scores Across Diagnosis. This figure illustrates a marginally significant interaction wherein the ASD group, followed by the SLI and typical groups, showed a greater increase in imagination when aided by a parent than the ADHD and SLI+ADHD groups.
Figure 2. Independent and Parent-Child Play Complexity-Elaboration Scores Across Diagnosis. This figure illustrates an interaction wherein the complexity-elaboration scores of the ASD, SLI, and typical groups improved the most when aided by a parent while the scores for the ADHD group decreased.
Appendix A

Play Content

<table>
<thead>
<tr>
<th>Time</th>
<th>No Play</th>
<th>Functional Play</th>
<th>Pretend Play</th>
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</thead>
<tbody>
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<td></td>
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</tr>
<tr>
<td>0:21-0:40</td>
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<td>0:41-1:00</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1:40-2:00</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2:01-2:20</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2:21-2:40</td>
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<tr>
<td>2:41-3:00</td>
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<td></td>
</tr>
<tr>
<td>3:01-3:20</td>
<td></td>
<td></td>
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</tr>
<tr>
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<tr>
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<td>4:21-4:40</td>
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<td></td>
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<tr>
<td>TOTAL/15 (%)</td>
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</tr>
</tbody>
</table>

IMAGINATION-PRETENSE:

1  2  3  4  5

ORGANIZATION:

1  2  3  4  5

COMPLEXITY-ELABORATION:

1  2  3  4  5

COMFORT:

1  2  3  4  5

# OF THEMES ____________

# OF DIFFERENT THEMES ____________

# OF REDIRECTIONS ____________
Appendix B

PARENT-CHILD PLAY SCALE

Child Variables

CHILD TEMPERAMENT

Mood:
Happy-----------------------------------Unhappy
1 2 3 4

Approach:
Exploring---------------------------------Reserved
1 2 3 4

Activity:
High Activity Level--------------------Low Activity Level
1 2 3 4

Intensity:
Intense with toys--------------------Lack of Intensity with toys
1 2 3 4

Intense with parent--------------------Lack of Intensity with parent
1 2 3 4

Distractibility:
Distractible---------------------------------Persistent
1 2 3 4

Child Role in Play:
Directive---------------------------------Following
1 2 3 4

CHILD EMOTIONAL AVAILABILITY

Intrusiveness:
Not intrusive---------------------------------Intrusive
1 2 3 4

Engagement:
Not engaged---------------------------------Engaged
1 2 3 4

Encouragement:
Not encouraging--------------------------Encouraging
1 2 3 4
Warmth:

Not warm------------------------Warm

1  2  3  4

Hostility:

Not hostile-------------------------Hostile

1  2  3  4
Parent Variables

PARENTAL TEMPERAMENT

Mood:
Happy------------------------------------------Unhappy

1 2 3 4

Approach:
Exploring-------------------------------------Reserved

1 2 3 4

Activity:
High Activity Level--------------------------Low Activity Level

1 2 3 4

Intensity:
Intense with toys--------------------------Lack of Intensity with toys

1 2 3 4

Intense with child--------------------------Lack of Intensity with child

1 2 3 4

Distractibility:
Distractable---------------------------------Persistent

1 2 3 4

Parent Role in Play:
Directive--------------------------------------Following

1 2 3 4

PARENTAL EMOTIONAL AVAILABILITY

Intrusiveness:
Not intrusive-----------------------------------Intrusive

1 2 3 4

Engagement:
Not engaged-----------------------------------Engaged

1 2 3 4

Encouragement:
Not encouraging-----------------------------Encouraging

1 2 3 4
Warmth:
Not warm-------------------------------------------Warm
1 2 3 4

Hostility:
Not hostile----------------------------------------Hostile
1 2 3 4
**Parent-Child Interaction Variables**

**VERBAL AND NONVERBAL BEHAVIORS**
*Record all of the following using a tally system on graph paper then transfer totals to table.*

<table>
<thead>
<tr>
<th># of Questions</th>
<th>Parent</th>
<th>Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>Praise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labeling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thought Formation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elaboration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Redirection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Misdirection</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th># of Statements</th>
<th>Parent</th>
<th>Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>Praise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labeling</td>
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<tr>
<td>Thought Formation</td>
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<tr>
<td>Elaboration</td>
<td></td>
<td></td>
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<tr>
<td>Redirection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Misdirection</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th># of Behaviors</th>
<th>Parent</th>
<th>Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>Praise</td>
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<tr>
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</tr>
<tr>
<td>Redirection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Misdirection</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CONTACT**

*Record all of the following using total values.*

- # of 10s intervals with physical contact
  - Parent: 
  - Child: 

- # of 10s intervals with eye contact
  - Parent: 
  - Child: 

RECI PROCITY OF PLAY

Total # of chains

Average Length of Turn-Taking (count each parent-child turn as 1)

Longest Chain of Turn-Taking (count each parent-child turn as 1)
GUIDELINES FOR SCORING CHILD TEMPERAMENT:

Child Variables

Mood

Measures affect observed during the session.

1. **Mostly happy.** Exhibits positive affect for the majority (over 75%) of the session including smiling and/or laughter.
2. **Somewhat happy.** Positive affect is predominant (over 50%) but inconsistent during the session. Some smiling and/or laughter is exhibited.
3. **Somewhat unhappy.** Negative affect is predominant (over 50%) but inconsistent during the session. Child occasionally frowns, sighs, and/or has a negative facial expression/body posture (slouching, turning away, etc.).
4. **Mostly unhappy.** Exhibits negative affect for the majority (over 75%) of the session including frowning, sighing, and/or negative facial expression/body posture (slouching, turning away, etc.).

Approach

Measures the degree to which the child is exploring the play environment.

1. **Mostly explorative.** The child explores and investigates the various toys and play area around him or her for the majority of the session. The child does not appear to have any difficulty using the materials provided.
2. **Somewhat explorative.** Exploration and investigation of toys and play area is predominant during session. Child may have a small number of instances where he or she appears hesitant within the play environment.
3. **Somewhat reserved.** Hesitation and a lack of investigation of the toys is predominant during the session. The child frequently “hangs back” from the table and the toys.
4. **Mostly reserved.** Child is reluctant to investigate or explore the toys and play area during the majority of the session. Child consistently “hangs back” from the table and toys.

Activity

Measures the degree to which the child exhibits hyperactivity to inactivity.

1. **Mostly active.** Child is very energetic and in constant motion for the majority of the play session.
2. **Somewhat active.** Child is predominantly energetic and in motion during the session. Child rarely exhibits lethargy or exhaustion.
3. **Somewhat inactive.** Child is predominantly inactive and slow-moving. He or she has periods of exhaustion or lethargy.
4. **Mostly inactive.** Child is inactive and slow-moving for the majority of the play session. He or she appears consistently tired or lethargic

Intensity of interaction with toys

Measures the intensity of the interaction that the child has with the toys.

1. **Mostly intense with toys.** Child interaction with toys is enthusiastic, engaged, and vigorous for the majority of the session. Child is very involved in the toys and aware of them.
(2) **Somewhat intense with toys.** Child is predominantly enthusiastic, engaged and vigorous with the toys. Child is involved in the toys and aware of them but has rare instances of disengagement.

(3) **Somewhat lacks intensity with toys.** Child exhibits some detachment from the toys. Child has several periods of disengagement from and disinterest in the toys.

(4) **Mostly lacks intensity with toys.** Child appears detached from the toys for the majority of the session. Child is disengaged and disinterested in the toys. He or she appears uninvolved and unreactive to the toys.

**Intensity of interaction with parent**

Measures the intensity of the interaction that the child has with the parent.

(1) **Mostly intense with parent.** Child interaction with parent is enthusiastic, engaged, and vigorous for the majority of the session. Child is very involved in the parent and aware of him or her.

(2) **Somewhat intense with parent.** Child is predominantly enthusiastic and engaged with the parent. Child is involved in the parent and aware of him or her but has rare instances of disengagement.

(3) **Somewhat lacks intensity with parent.** Child exhibits some detachment from the parent. Child has several periods of disengagement from and disinterest in the parent.

(4) **Mostly lacks intensity with parent.** Child appears detached from the parent for the majority of the session. Child is disengaged and disinterested in the child. He or she appears uninvolved and nonreactive to the parent.

**Distractibility**

Measures the degree of focus, persistence, and distractibility during the play session.

(1) **Mostly distractible.** Child cannot stay focused for the majority of the session. He or she generally lacks persistence.

(2) **Somewhat distractible.** Child is predominantly unfocused. He or she frequently evidences a lack of persistence but has rare instance of persistence and focus.

(3) **Somewhat persistent.** Child is predominantly focused. He or she frequently evidences persistence and a lack of distractibility but has rare instances of distractibility.

(4) **Mostly persistent.** Child is focused for the majority of the session. He or she is very persistent in general and not distractible.

**Child Role in Play**

Measures the child’s role in play

(1) **Mostly Directive** The child consistently directs the play.

(2) **Somewhat Directive** The child tends to direct the play.

(3) **Somewhat Following** The child tends to follow the parent’s play.

(4) **Mostly Following** The child consistently follows the parent’s play.

**GUIDELINES FOR SCORING CHILD EMOTIONAL AVAILABILITY**

**Intrusiveness**

Measures the amount of involvement of the child in the parent’s play

(1) **Mostly unintrusive.** Child never interrupts or redirects the parent’s play.

(2) **Somewhat unintrusive.** Child tends to let the parent play independently
(3) **Somewhat intrusive.** Child tends to interrupt or redirect the parent’s play
(4) **Mostly intrusive.** Child consistently interrupts or redirects the parent’s play

**Engagement**

Measures the degree of parent-child engagement
(1) **Mostly unengaged.** Child does not respond to the parent or interact with the parent.
(2) **Somewhat unengaged.** Child tends to ignore the parent’s requests for interaction and does not tend to initiate interaction.
(3) **Somewhat engaged.** Child tends to respond to the parent and interact with the parent.
(4) **Mostly engaged.** Child consistently responds to the parent and interacts with the parent.

**Encouragement**

Measures the amount of encouragement that the child exhibits towards the parent
(1) **Mostly not encouraging.** Child does not encourage the parent’s attempts to play.
(2) **Somewhat not encouraging.** Child rarely encourages the parent while playing.
(3) **Somewhat encouraging.** Child frequently encourages the parent to play.
(4) **Mostly encouraging.** Child consistently encourages the parent to play.

**Warmth**

Measures the amount of warmth that the child exhibits towards the parent.
(1) **Mostly lacking warmth.** Child displays predominantly flat (or negative) affect when engaging with the parent.
(2) **Somewhat lacking warmth.** Child tends to display flat (or negative) affect when engaging with the parent.
(3) **Somewhat warm.** Child tends to display positive affect when engaging with the parent.
(4) **Mostly warm.** Child displays predominantly positive affect when engaging with the parent.

**Hostility**

Measures the amount of hostility that the child exhibits towards the parent.
(1) **Mostly lacking hostility.** Child displays predominantly flat (or positive) affect when engaging with the parent.
(2) **Somewhat lacking hostility.** Child tends to display flat (or positive) affect when engaging with the parent.
(3) **Somewhat hostile.** Child tends to display negative affect when engaging with the parent.
(4) **Mostly hostile.** Child displays predominantly negative affect when engaging with the parent.
Parent Variables

GUIDELINES FOR SCORING PARENTAL TEMPERAMENT:

Mood
Measures affect observed during the session.
(1) Mostly happy. Exhibits positive affect for the majority (over 75%) of the session including smiling and/or laughter.
(2) Somewhat happy. Positive affect is predominant (over 50%) but inconsistent during the session. Some smiling and/or laughter is exhibited.
(3) Somewhat unhappy. Negative affect is predominant (over 50%) but inconsistent during the session. Parent occasionally frowns, sighs, and/or has a negative facial expression/body posture (slouching, turning away, etc.).
(4) Mostly unhappy. Exhibits negative affect for the majority (over 75%) of the session including frowning, sighing, and/or negative facial expression/body posture (slouching, turning away, etc.).

Approach
Measures the degree to which the parent is exploring the play environment.
(1) Mostly explorative. The parent explores and investigates the various toys and play area around him or her for the majority of the session. The parent does not appear to have any difficulty using the materials provided.
(2) Somewhat explorative. Exploration and investigation of toys and play area is predominant during session. Parent may have a small number of instances where he or she appears hesitant within the play environment.
(3) Somewhat reserved. Hesitation and a lack of investigation of the toys is predominant during the session. The parent frequently “hangs back” from the table and the toys.
(4) Mostly reserved. Parent is reluctant to investigate or explore the toys and play area during the majority of the session. Parent consistently “hangs back” from the table and toys.

Activity
Measures the degree to which the parent exhibits hyperactivity to inactivity.
(1) Mostly active. Parent is very energetic and in constant motion for the majority of the play session.
(2) Somewhat active. Parent is predominantly energetic and in motion during the session. Parent rarely exhibits lethargy or exhaustion.
(3) Somewhat inactive. Parent is predominantly inactive and slow-moving. He or she has periods of exhaustion or lethargy.
(4) Mostly inactive. Parent is inactive and slow-moving for the majority of the play session. He or she appears consistently tired or lethargic.

Intensity of interaction with toys
Measures the intensity of the interaction that the parent has with the toys.
(1) Mostly intense with toys. Parent interaction with toys is enthusiastic, engaged, and vigorous for the majority of the session. Parent is very involved in the toys and aware of them.
(2) **Somewhat intense with toys.** Parent is predominantly enthusiastic, engaged and vigorous with the toys. Parent is involved in the toys and aware of them but has rare instances of disengagement.

(3) **Somewhat lacks intensity with toys.** Parent exhibits some detachment from the toys. Parent has several periods of disengagement from and disinterest in the toys.

(4) **Mostly lacks intensity with toys.** Parent appears detached from the toys for the majority of the session. Parent is disengaged and disinterested in the toys. He or she appears uninvolved and unreactive to the toys.

**Intensity of interaction with child**

Measures the intensity of the interaction that the parent has with the child.

(1) **Mostly intense with child.** Parent interaction with child is enthusiastic, engaged, and vigorous for the majority of the session. Parent is very involved in the child and aware of him or her.

(2) **Somewhat intense with child.** Parent is predominantly enthusiastic and engaged with the child. Parent is involved in the child and aware of him or her but has rare instances of disengagement.

(3) **Somewhat lacks intensity with child.** Parent exhibits some detachment from the child. Parent has several periods of disengagement from and disinterest in the child.

(4) **Mostly lacks intensity with child.** Parent appears detached from the child for the majority of the session. Parent is disengaged and disinterested in the child. He or she appears uninvolved and unreactive to the child.

**Distractibility**

Measures the degree of focus, persistence, and distractibility during the play session.

(1) **Mostly distractible.** Parent cannot stay focused for the majority of the session. He or she generally lacks persistence.

(2) **Somewhat distractible.** Parent is predominantly unfocused. He or she frequently evidences a lack of persistence but has rare instance of persistence and focus.

(3) **Somewhat persistent.** Parent is predominantly focused. He or she frequently evidences persistence and a lack of distractibility but has rare instances of distractibility.

(4) **Mostly persistent.** Parent is focused for the majority of the session. He or she is very persistent in general and not distractible.

**Parent Role in Play**

Measures the parent’s role in the play

(1) **Mostly Directive** The parent consistently directs the play.

(2) **Somewhat Directive** The parent tends to direct the play.

(3) **Somewhat Following** The parent tends to follow the child’s play.

(4) **Mostly Following** The parent consistently follows the child’s play.

GUIDELINES FOR SCORING PARENTAL EMOTIONAL AVAILABILITY:

**Intrusiveness**

Measures the amount of involvement of the parent in the child’s play
(1) **Mostly unintrusive.** Parent never interrupts or redirects the child’s play.
(2) **Somewhat unintrusive.** Parent tends to let the child play independently
(3) **Somewhat intrusive.** Parent tends to interrupt or redirect the child’s play
(4) **Mostly intrusive.** Parent consistently interrupts or redirects the child’s play

**Engagement**
Measures the degree of parent-child engagement
(1) **Mostly unengaged.** Parent does not respond to the child or interact with the child.
(2) **Somewhat unengaged.** Parent tends to ignore the child’s requests for interaction and does not tend to initiate interaction.
(3) **Somewhat engaged.** Parent tends to respond to the child and interact with the child.
(4) **Mostly engaged.** Parent consistently responds to the child and interacts with the child.

**Encouragement**
Measures the amount of encouragement that the parent exhibits towards the child
(1) **Mostly not encouraging.** Parent does not encourage the child’s attempts to play.
(2) **Somewhat not encouraging.** Parent rarely encourages the child while playing.
(3) **Somewhat encouraging.** Parent frequently encourages the child to play.
(4) **Mostly encouraging.** Parent consistently encourages the child to play.

**Warmth**
Measures the amount of warmth that the parent exhibits towards the child.
(1) **Mostly lacking warmth.** Parent displays predominantly flat (or negative) affect when engaging with the child.
(2) **Somewhat lacking warmth.** Parent tends to display flat (or negative) affect when engaging with the child.
(3) **Somewhat warm.** Parent tends to display positive affect when engaging with the child.
(4) **Mostly warm.** Parent displays predominantly positive affect when engaging with the child.

**Hostility**
Measures the amount of hostility that the parent exhibits towards the child.
(1) **Mostly lacking hostility.** Parent displays predominantly flat (or positive) affect when engaging with the child.
(2) **Somewhat lacking hostility.** Parent tends to display flat (or positive) affect when engaging with the child.
(3) **Somewhat hostile.** Parent tends to display negative affect when engaging with the child.
(4) **Mostly hostile.** Parent displays predominantly negative affect when engaging with the child.
**Parent-Child Interaction Variables**

GUIDELINES FOR SCORING VERBAL AND NONVERBAL BEHAVIORS

Record each of the following for both parent and child questions and statements using a tally system.

**Praise**
A positive remark or behavior that encourages and/or supports an action or statement made by the other person.

**Organizing**
A verbalization or behavior that is designed to organize the play session.

Example: Let’s put these animals over here and just play with the water animals.

**Labeling**
The parent or child presents a question or a statement that is an attempt to test knowledge that the other is known to possess.

Example: What animal is this? What does this animal eat?

**Thought Formation**
These statements introduce new knowledge. These statements may also present novel connections between what is happening in the play session to other aspects of the world or his/her life. They are attempts to advance knowledge and understanding.

Examples: All of these animals are mammals like us.

Last month we went to the zoo and we saw animals just like these.

**Elaboration**
An elaboration is made when a behavior or statement adds complexity to the current play activity.

Examples: (Child pushes animals together) Mom asks: Are you making them fight?

Keep the baby with the mom because they want to play in the water.

**Redirection**
A redirection occurs when the parent/child is redirected in such a way that play is facilitated.

**Misdirection**
A misdirection occurs when the parent or child impedes the play.

Example: I want to go look out the window now.

**NOTE REGARDING THE SCORING OF BEHAVIORS:**

Code a behavior as a relevant category if it provides support/is involved in a statement/question.

Example: (mother picks up tiger and asks:) What is this guy called?

This example would be scored as 1 labeling question and 1 labeling behavior.

Example: (child moves car with noise) He’s getting ready for the race!

This example would be scored as 1 elaboration statement and 1 elaboration behavior.
GUIDELINES FOR SCORING CONTACT

Physical Contact
*Record 10s intervals with physical contact using a tally system.*
*Record 10s intervals with eye contact using a tally system.*

GUIDELINES FOR SCORING RECIPROCITY OF PLAY

*Record using a count system.*

**Total # of chains**
The number of chains is calculated by counting up the number of thematic conversations present in the play sample. The turn-taking chain ends when another theme begins.

Example: A dyad organizes play, tells a story about a bear at the pool, and labels all the animals. This play would include 3 chains.

**Average length of turn-taking**
This is a calculated average of the number of turns taken divided by the total number of chains. A turn is taken when one member of the dyad speaks and the other member responds appropriately. Record 1 tally for each reciprocated statement (i.e. parent speaks, child responds is counted as 1).

**Longest chain of turn-taking**
A turn is taken when one member of the dyad speaks and the other member responds appropriately. Record 1 tally for each reciprocated conversation (i.e. parent speaks, child responds is counted as 1).
References


Johnston, C. (1996). Parent characteristics and parent-child interactions in families of nonproblem children and ADHD children with higher and lower levels of


