

Parent–child interactions in autism: Characteristics of play

Autism

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Abstract

Although the literature on parent–child interactions in young children with autism has examined dyadic style, synchrony, and sustained engagement, the examination of parental skill in sustaining and developing play skills themselves has not been targeted. **This study examined the extent to which parents of young children with autism match and scaffold their child's play.** Sixteen dyads of parents and their children with autism participated in this study along with 16 matched dyads of typically developing children. Both groups were administered a structured play assessment and were observed during a 10-min free play situation. Strategies of play were examined and results revealed that parents of children with autism initiated more play schemes and suggested and commanded play acts more than parents of typical children. They also responded to their child's play acts more often with a higher level play act, while parents of typical children matched/expanded their responses to their child. Parent imitation was also related to longer sequences of play. The findings can guide further research and play intervention for parents.

Keywords

Autism, parent, play skills, scaffolding

Children with autism have significant difficulties with play (see, for review, Jarrold et al., 1993). They often engage with objects in repetitive ways and fail to develop creative and symbolic engagement with objects. Such limitations in the development of play are cause for concern as play represents an underlying mechanism that manifests itself in other “symbolic” areas such as

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language development, emotional development, and cognitive development (Leslie, 1987; Libby et al., 1998; Saltz et al., 1977; Wulff, 1985). Moreover, play provides a platform for social engagement with others, and indeed, socially connected play and social behavior with others are particularly impaired in children with autism (Jordan, 2003; Kasari et al., 2010b; Nadel and Peze, 1993). Thus, important intervention targets for children with autism include both the development of play skills and social play engagement with others.

In general, complex play in children can be developed through more sophisticated partners such as parents who can imitate, model, and prompt their children's actions (Riguet et al., 1981; Sigman and Ungerer, 1984; Stahmer, 1995). According to theoretical views (e.g. Vygotsky, 1986), a more experienced other (e.g. parent) can provide instruction at and just slightly above the child's level of current performance so as to facilitate the learning of new and emerging skills. The more experienced other supports a child's less sophisticated effort by structuring and guiding the child's developing mental abilities (Rogoff, 1990; Rogoff and Wertsch, 1984). Defining just what these efforts or strategies are has been less explicit in the play of children. Effective play interactions may occur when a more experienced play partner understands a child's current play ability, supports the child's continuing attempts to play, and expands upon that play by modeling more advanced play forms (Frey and Kaiser, 2011; Kasari et al., 2006; Malone and Langone, 1998).

Intervention research has focused on developing play in therapeutic situations with both therapists and parents of children with a variety of disabilities. In therapist-child interactions, although the method of instruction is still under debate (directive vs nondirective), a number of characteristics of effective interactions have been identified, such as establishing joint engagement, imitating the child's actions on objects, using appropriate developmental prompting, and attending to the structure of the environment (Kasari et al., 2006; Kohler et al., 2001; Lifter et al., 2005; Malone and Langone, 1998; Stahmer, 1995, 1999). In parent-child interactions, the relationship between the participants is highlighted with contingent responsiveness, sensitivity, warmth, nurturance, appropriate levels of stimulation, and predictability as being related to more positive outcomes for children with a variety of disabilities (Clarke-Stewart, 1973; Field, 1978; Koegel et al., 1996; Shonkoff and Phillips, 2000). Nonetheless, the constructive aspects of parent-child interaction are similar to those described in therapist-led interactions: parents facilitate greater child engagement when they maintain the child's attention to various play objects, follow the child's attentional focus, engage responsively, scaffold interactions, and use strategies such as imitation (Childress, 2011; Lewy and Dawson, 1992; McCollum and Hemmeter, 1997; Marfo et al., 1998; Seifer et al., 1991). Nonresponsive behaviors of intrusiveness, questions, and directives have been found to be associated with less engagement (Kim and Mahoney, 2004; Landry et al., 1996).

In autism, an added complication is that children have limited or unusual play skills; thus, maintaining attention to the object while coordinating social engagement becomes more difficult and parental strategies become more important. Parents of children with autism may have more difficulty achieving productive, enjoyable, and interactive play experiences because of the child's limitations in person/object engagement. Children with autism tend to engage in object-focused interactions; that is, their attention is wholly focused on the object without involving another person in their play (Kasari et al., 2010a). Greater time in joint engagement (with objects and people) is important for further development of language (Adamson et al., 2004; Kasari et al., 2008). It can be very difficult for parents to engage the child in reciprocal, symbolic, turn-taking play episodes without intervention (Kasari et al., 2010a).

One area that has received relatively little attention concerns the specific parent strategies that sustain play engagement and connected play interactions. A parent-child interaction that includes episodes of sustained play engagement is critical for development in children with autism. This

study examined the following hypotheses. First, both children with and without autism are expected to play at a higher level in a structured assessment with a therapist as compared to an unstructured session with a parent. Second, within a play session with parents, it is expected that typical children will initiate more and engage in longer sustained play scenarios (schemes) than children with autism. Finally, it is expected that certain specific parent strategies such as imitation and appropriate scaffolding will lead to longer and more connected play interactions.

Method

Participants

The participants included 32 children, 16 typically developing and 16 with autism. The typical subjects were recruited from local preschools and day care centers. The children with autism were recruited from a local Autism Evaluation Clinic. Fliers and letters describing the study were sent home with the children, and parents were asked to contact the researchers to participate.

Table 1 describes the demographic information of the two groups. The children with autism and the typical children were matched on receptive language age and expressive language age as measured by the Reynell Developmental Language Scales (Reynell, 1977). Mental age was calculated using the Stanford–Binet Scales of Intelligence (Thorndike et al., 1986) or the Mullen Scales of Early Learning (Mullen, 1995). Both groups of mothers were highly educated, with equal numbers of mothers who had completed college (13 in both groups).

In the autism group, 14 parents reported that they had participated in parent behavioral training through the local regional center or their home behavioral agency. Only four parents reported that their child had participated in a social skills/developmental program in addition to their classroom programs and specialized therapies (e.g. speech, occupational therapy, behavioral therapy). No parent reported that their child’s therapy or behavioral parent training program was specifically targeted toward play skills, although the four parents in the social skills group felt that play was one component of the group. *T*-tests were conducted on chronological age, receptive language age, expressive language age, and mental age. Only chronological age was significantly different between groups (autism vs typical).

Table 1. Demographic characteristics.

Child and parent characteristics	Autism group	Typical group
Age equivalent in months (SD)		
Chronological age	49.5 (11.8)	28.5 (8.8)
Mental age	39.8 (13.6)	36.12 (11.5)
Language age		
Receptive	37.06 (13.1)	38.12 (11.3)
Expressive	37.31 (17.1)	37.94 (13.4)
Gender (males/females)	12/4	9/7
Mother’s education		
Some college	1	1
Special training	2	2
Completed college	12	3
Graduate school	1	10

Procedures

Once initial contact had been made by the parent, the parents were asked to come to the laboratory for an initial interview (*Autism Diagnostic Interview-Revised (ADI-R)*) to confirm research criteria for autism. The *ADI-R* was administered individually to the parent(s).

The *ADI-R* is a standardized semi-structured, investigator-based interview for caregivers of children with autism (Lord et al., 1999). It provides a diagnostic algorithm for the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994) definition of autism. It takes approximately 2 h to administer and gather information on social interaction, communication, repetitive behaviors, and age of onset. The items are scored, and a diagnostic algorithm is used to determine whether the child meets criteria for autism. All 16 children met criteria for autism on all four domains of the *ADI-R*.

Once the *ADI-R* was administered, the procedure for both the children with autism and the typical children was the same. The parents and children were asked to come to the laboratory for the assessments lasting approximately 2 h. The assessment room contained a child-sized table, two chairs, and toy shelves. Parents could observe the procedure through a one-way mirror or remain with their child in the room. During the assessment, the parents completed a demographic questionnaire.

The children were administered a nonstandardized assessment of play abilities to obtain an independent mastered play level (structured play assessment, Ungerer and Sigman, 1984). In addition, the parent and child were asked to play with a standard set of toys with one parent for 10 min (parent-child interaction). Both assessments are described in the following.

Structured play assessment. In this procedure (Ungerer and Sigman, 1984), the child and tester sit facing each other at a table. The tester presents the child with individual toys and toys in groups of related items. The toys consist of three different-sized dolls, doll furniture, baby bottles, tea set, dump truck, garage, blocks, paper, three pieces of sponge, telephone, brush, and mirror. The entire play interaction lasts approximately 15–20 min and is videotaped.

Two raters blind to the hypotheses were trained to identify the types and frequencies of play behaviors of the children. Using the Developmental Play Assessment (DPA) Instrument Sequence of Categories (Lifter et al., 1988), the undergraduate coders labeled and counted the types and frequencies of play behaviors for the total session. For example, if a child gave a doll a bottle, it was counted as one type and one frequency of a child as agent act. If the child carried out the same act again, another frequency was counted but not another type. Thus, a child received a type and frequency score for each level of play. Reliability was calculated on unprompted types and frequencies of play acts for every level for 12 subjects. Intraclass correlation coefficients were calculated for every level of the Developmental Play Skills, and scores ranged from 0.94 to 1.00. Overall average intraclass correlation coefficient was 0.97.

Using each type and frequency score for each level, we then calculated a single level of play score for this assessment. This score represented the highest, most frequent, and flexible level at which the child played. We applied Lifter et al.'s (1993) requirements to assess the structured situation. This level was determined by identifying the highest spontaneous level attained with at least three different types and eight different frequencies. Lifter et al. required four different types with 10 frequencies in a 30-min play situation. Thus, for a 15- to 20-min structured play situation with four groups of toys being presented, we decreased the requirement by one type and two frequencies. Two different graduate assistants independently judged the scoring and 16 out of 16 levels were identified precisely (100% agreement). Nearly all the children showed greater types

and frequencies at their designated level than the cutoff required. Also, nearly all showed only single instances of higher level skills beyond their identified level. Thus, the level was quite obvious.

Parent-child free play. Parents and children were observed in free play for 10 min. Parents were asked to play with their child using a standard set of toys and the interaction was videotaped. Parents were instructed to “play with their child as they play with them at home.” The toys included a tea set, dinosaurs, human figures, furniture set, a large rubber ball, a shape sorter, a variety of blocks, and a medium-sized blanket.

Two raters were trained to code the 10-min observation using both time sampling techniques to identify the play schemes and event sampling techniques to identify the play acts. *Play schemes* were operationally defined as an event or a play sequence made up of connected play acts with connected toys (e.g. “tea party” scheme or “dinosaur battle” scheme). The DPA Instrument Sequence of Categories (Table 2) (Kasari et al., 2006; Lifter et al., 1988) was used to evaluate the *play acts* (the acts that make up the scheme). This coding took place via computer coding system (Observer; Noldus) to identify the sequences of play acts by both participants (parent and child).

The coding system was done in two passes. Pass 1 examined the *play schemes* and utilized a time sample design in that the start time and the end time of each play scheme were identified. Thus, duration for each play scheme was calculated, and the originator of the scheme (parent’s idea or child’s idea) was identified. Pass 2 involved identifying all the parent and child *play acts* (see Tables 2 and 3). This involved categorizing the *type* of play act using the Developmental Play Skills Levels (e.g. child pretends that a block is a hamburger = substitution level), *who carried out the act* (parent or child), and *how it was presented/the strategy the parent used* (suggested, commanded, or imitated). If an act was suggested, either the parent or the child suggested (verbal, model, or gesture) a new, original play act that did not imitate a previous play act. If an act was commanded, either the parent or child requested (verbally, hand over hand, or gesturally) the partner to engage in an act. If an act was imitated, the parent or the child repeated the previous act. The parent or the child could imitate their own acts or their partner’s act. Table 4 shows an example of a transcription.

Reliability was calculated on scheme duration and frequency using the full 10-min session for eight subjects (25% of the sample). Intraclass correlation coefficients were used and the following coefficients were obtained: child-initiated schemes’ duration = 0.99, parent-initiated schemes’ duration = 0.99, child-initiated schemes’ frequency = 0.97, parent-initiated schemes’ frequency = 0.93, and total time spent in schemes = 0.97.

Reliability was calculated on play acts using the first 3 min of all 32 children (30% of the total time) and intraclass correlation coefficients. This reliability sampling was chosen to ensure agreement across a wide variety of play acts, and since multiple play acts could occur in a short period of time, a rich sample was achieved. Play acts were collapsed into four levels—simple object manipulation (indiscriminate acts, discriminate acts, takes apart combinations), combinations (general, presentation, conventional), child as the agent (pretend self, child as agent, single-scheme sequences) and imaginative (substitutions, doll as agent, multischeme sequences, thematic and sociodramatic play)—and examined for both the parent and the child. The following were the intraclass correlation coefficients for child: simple object manipulation = 0.60, combinations = 0.87, human as the agent = 0.65, and imaginative = 0.87. The following were the intraclass correlation coefficients for parent: simple object manipulation = 0.80, combinations = 0.82, child as the agent = 0.85, and imaginative = 0.85.

Table 2. Type of play act (Developmental Play Skills Levels).

Level number	Categories	Definition
1	Indiscriminate actions	All objects are treated alike (e.g. all objects are mouthed)
2	Discriminative actions	Differentiates among objects, preserving their physical or conventional characteristics (e.g. rolls round beads, squeezes stuffed animal)
3	Takes apart combinations	Separates configurations of objects (e.g. takes pieces out)
4	Presentation combinations	Re-creates combinations of objects according to their presentation configuration (e.g. puts puzzle pieces into puzzle; nests the nesting cups)
5	General combinations	Creates combinations of objects that result in simple, nonspecific configurations such as container/contained relations (e.g. puts beads and puzzle pieces in the cup)
6	Pretend self	Relates objects to self, indicating a pretend quality to the action (e.g. brings empty cup to mouth to drink)
7	Physical and conventional combinations	Preserves unique physical characteristics of objects in the configuration (e.g. stacks cups, strings beads as necklace) and unique conventional characteristics of object in the configuration (e.g. places cup on saucer)
8	Child as agent	Extends familiar actions to doll figures, with child as agent of the activity (e.g. extends cup to doll's mouth)
9	Single-scheme sequences	Extends same familiar action to two or more figures (e.g. extends cup to baby doll, to stuffed lamb, to interactant)
10	Substitutions	Uses one object to stand in place for another (e.g. bowl as hat)
11	Substitutions without object	Pretends to use something that is not there (e.g. shakes an imaginary salt shaker)
12	Doll as agent	Moves doll figures as if they are capable of action (e.g. moves figure to load blocks in a truck; puts mirror into doll's hand as if to see itself)
13	Multischeme sequences	Extends different actions to same figure (e.g. feeds doll with spoon, gives doll a bath, then puts to bed)
14	Thematic/fantasy play	Adopts various familiar roles in play theme (e.g. plays house, assigning the various roles) or of fantasy characters (e.g. plays "Superman" or "Wonderwoman," assigning the various roles)

Source: Kasari et al. (2006) and Lifter et al. (1988).

A *single level of play* was also determined in the free play situation for both the parent and the child. An overall weighted play level score was calculated for the parent and the child by counting all possible presentations of play acts (suggestions, commands, imitates) at each level (e.g. child as agent), multiplying by the level number, summing across all levels, and dividing by the total number of play acts. This is a commonly used equation to determine weighted averages that account for the number of times the participant plays at each level.

Further analyses required an examination of events that were in *response to a previous event*. Thus, given a play act by either the parent or the child, the immediately following response was

Table 3. Categorizing play acts.

<i>Who carried out the act</i>	<i>Definition</i>
Parent	The parent in the interaction is engaging with the objects
Child	The child in the interaction is engaging with the objects
<i>How it was presented/strategies</i>	<i>Definition</i>
Commanded	Participant (parent or child) requests a motor action, verbal response, or motor action and verbal response from the other using a verbalization, a hand-over-hand prompt, or a gesture. The verbalization is a direct imperative (Atwater and Morris, 1988; Bertsch et al., 2009)
Suggested	Participant (parent or child) verbally models, or gestures to suggest a new/original play act that does not imitate the act before using a nondemanding, indirect statement or physical motor movement (Atwater and Morris, 1988; Bertsch et al., 2009)
Imitated	The participant imitates an act by himself or herself or other. The participant can imitate their own act or the act of the other

Table 4. Sample transcription.

<i>Time/code</i>
0:00 Scheme start—parent (tea party)
0:01 Parent initiates—conventional combination (puts fork next to bowl)
0:05 Parent initiates—conventional combination (puts spoon next to bowl)
0:10 Child imitates—conventional combination (puts spoon next to bowl)
0:31 Child initiates—pretend self (child brings cup to mouth)
0:35 Parent imitates—pretend self (parent brings cup to mouth)
0:52 Parent prompts—conventional combination (verbal—"here, put this cup with your setting.")
1:20 Child imitates—conventional combination (child puts cup with plate)
1:25 Child initiates—discriminate act (makes the mixer turn)
1:32 Parent prompts—conventional combination/substitution (verbal—"here's a bowl with cake mix, mix the cake mix")
1:46 Child imitates—conventional combination/substitution (child mixes in the bowl)
2:10 Scheme ends
2:12 Scheme starts—Child—(shape sorter)
2:13 Child initiates—takes apart combination (child dumps shapes out of sorter)

examined. Using the DPA Instrument Sequence of Categories (Lifter et al., 1988), the responding act was counted as either higher, lower or matched/expansive to that previous act at the same level or one level higher (not imitated, but another act at the same level). The sequential analysis program GSEQ (Bakeman and Quera, 1995) was used to generate matrices to summarize an act and the act immediately following (the response to the act). Finally, the participant who ended a scheme was noted. The act immediately preceding a scheme end was summarized as either a parent-initiated high, parent-initiated low, parent-initiated matched/expansive act (as defined by the DPA) or parent imitated. Children's acts were summarized as "child end" but not defined more specifically in the analyses.

Table 5. Level of play: parent and child.

	Autism	Typical
Structured play measure		
Mean level of play of child	8.1	9.1
Parent–Child interaction		
Mean level of play of child	6.7	6.3
Mean level of play of parent	7.7	6.6

Score is based upon Developmental Play Skills Levels (Kasari et al., 2006; Lifter et al., 1988) range 1 through 14 levels of play.

Results

Establishing play level

Children's play levels were examined within both the structured play measure and the parent–child interaction to establish a baseline (Table 5). The *Structured Play* measure was used to establish the children's most frequent spontaneous level of play in a structured situation. The mean level of play for children with autism was 8.1 (standard deviation (SD) = 1.9), which represents the "child as agent" level of play. The mean level of play for typical children was 9.1 (SD = 1.6), which represents the "single-scheme sequence" level of play. Thus, the typical children showed slightly higher play (by one level) than the children with autism although the difference was not significant. Using Pearson's correlations, the level of play was related to developmental characteristics in the typical group only: chronological age ($r(16) = 0.50$, $p < 0.05$) and mental age ($r(16) = 0.51$, $p < 0.05$).

Fourteen of 16 children with autism showed a few types and frequencies of higher level play than their classification. Thus, they could carry out play that was developmentally higher than "child as agent" (e.g. single-scheme sequences, substitutions, and multischeme sequences) but did not show these acts consistently. All the typical children showed at least one example of higher level play beyond their identified level of play.

In the *parent–child interaction*, the typical children and the children with autism played with the standard set of toys at approximately the same level ("pretend self") as did the parents of the typical children. The parents of children with autism, however, were playing about one level higher overall, although this was not significant. Compared to their performance on the structured play measure, all the children played at a lower level in the parent–child interaction than they did in the structured play situation.

In the typical group only, the play level of the parent and the play level of the child were correlated ($r(16) = 0.54$, $p < 0.05$). Thus, as a typical child was playing at higher levels of play, the parent also was scored at playing at higher levels of play. In the autism group, there was no correlation between parents' level of play and the children's level of play.

Establishing qualities of play in parent–child interaction (autism vs typical)

Initiations. The parent–child free play was examined to determine which member of the dyad was initiating the play schemes. Parents of children with autism began significantly more schemes (mean = 5.20, SD = 2.30) than parents of typical children (mean = 3.00, SD = 2.10), $t(30) = 2.80$, $p < 0.01$. Both children with autism and typical children initiated about the same number of

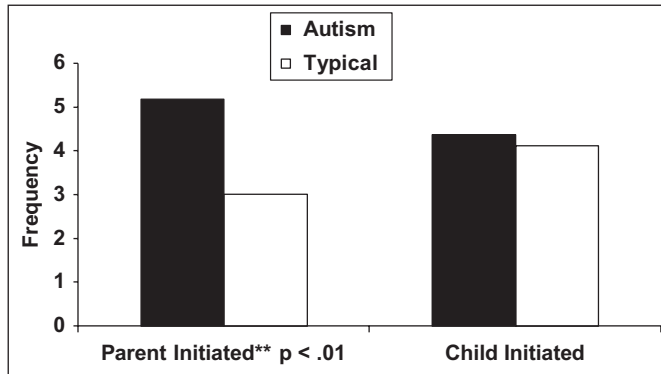


Figure 1. Mean number of schemes per 10-min parent-child interaction.

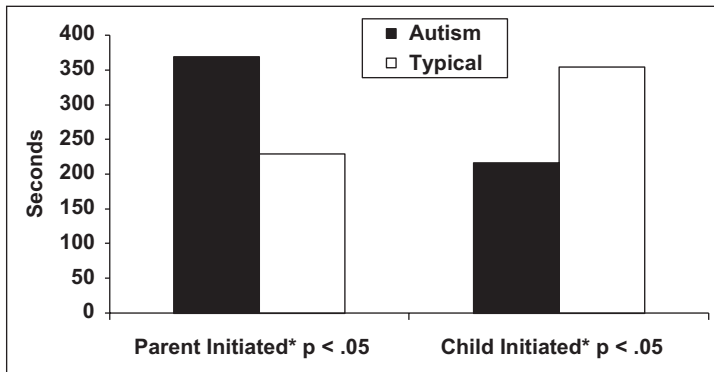


Figure 2. Mean duration (in seconds) of child-initiated and parent-initiated schemes.

schemes, mean = 4.37 (SD = 2.75) and 4.12 (SD = 2.70), respectively (Figure 1). Furthermore, parents of children with autism had longer lasting parent-initiated schemes ($t(30) = 2.12, p < 0.05$) than parents of typical children (Figure 2). The opposite was found in schemes initiated by the children. Schemes initiated by the typical children lasted longer ($t(30) = 2.3, p < 0.05$) than the schemes of the children with autism.

Parent strategies. The parent-child free play was also examined to determine what strategies parents were using. All parent strategies could be categorized into three types of acts. As mentioned, parents could suggest a play act (an act that is different than the previous act or the first act in a scheme), command their child to act, or imitate a previous act (an act that exactly imitates the previous act). A one-way analysis of variance (ANOVA) (autism vs typical parents) was conducted on the parent strategies within the dyad (suggestions, commands, and imitates). Overall, parents of children with autism engaged in more of these three types of play strategies than parents of typical children, and two of three were significantly different. Suggestions (autism mean = 25.8, SD = 13.2 vs typical mean = 13.2, SD = 8.9), $F(1, 30) = 9.89, p < 0.01$, and commands (autism mean = 12.56, SD = 8.1 vs typical mean = 7.8, SD = 4.6), $F(1, 30) = 4.05, p = 0.05$, were

significant. Repetitive acts were not different between groups (autism mean = 9.75, SD = 7.5 vs typical mean = 7.3, SD = 5.1, NS).

In contrast, the children's strategies were not significantly different between groups. One-way ANOVA (autism vs typical children) was conducted on the child strategies within the dyad (suggestions, commands, imitates). Both the children with autism and the typical children suggested actions on toys, imitated previous acts, and commanded their parents equally when compared between groups.

Matching play levels between parents and children

Given the importance of matching and appropriately expanding play level, a second question addressed the extent to which children and parents match and appropriately expand in their *level of play responses* to one another. A response to the other member could be either lower (acts that followed were one level lower in play level than the play level of the previous act), matching/expansive (acts that matched the level of the previous play act—not imitated but an act at the same play level or one level higher) or higher (acts that were at one level or above higher level than the previous play act). These scores were then divided by the total number of possible acts to get proportion scores. The proportion scores do not equal 100% however, as lower, matching, and higher acts did not encompass all acts—exceptions might be a parent who could begin a scheme or a parent who could repeat an act more than once (follow themselves). These exceptions were not included in the proportion of responses.

Overall, both groups had significantly more matched/expansive responses than higher or lower responses but this finding was qualified by the interaction effect. Parents of children with autism responded to their children's acts with a higher level of play, while parents of typical children had more matched-level responses (Figure 3). For the parents' response to a child suggestion, repeated measures 2 group (autism vs typical) \times 3 response type (lower, matched, higher) was conducted. A main effect for parent's response ($F(2, 56) = 14.67, p < 0.001$) and an interaction effect were found ($F(2, 56) = 9.44, p < 0.001$).

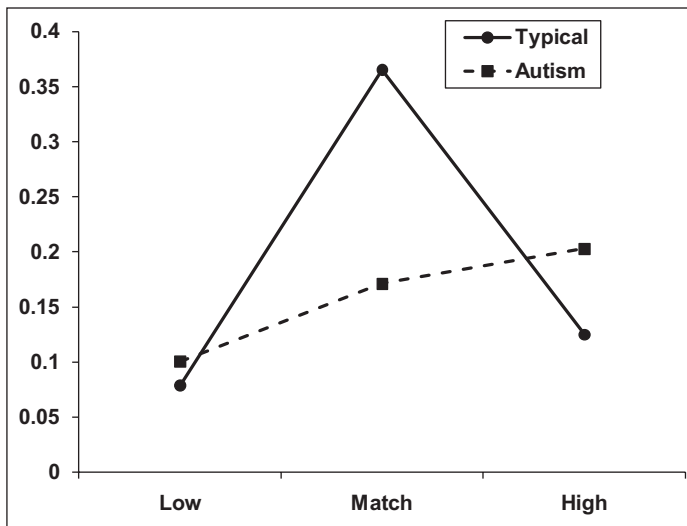


Figure 3. Parents of children with autism and parents of typical children: proportion of high, low, and matched responses to child initiations.

For the child's response following a parent suggestion, a repeated measures 2 group (autism vs typical) \times 3 response type (lower, matched/expansive, higher) was conducted. Only a main effect of response type was found ($F(2, 56) = 40.41, p < 0.001$). There was no main effect of group or interaction effect. Thus, overall, children in both groups responded to their parents' acts with an act at the same level (matched/expansive mean = 0.239, SD = 0.02) rather than at a higher level (mean = 0.035, SD = 0.01) or at a lower level (mean = 0.10, SD = 0.02). Therefore, if a parent played at a higher or a lower level of play, the child matched this level of play with their next play act.

Characteristics of longer play interactions

Mismatch in responses by parents was examined as they relate to play scheme frequency and duration. Across the whole sample, parents who had more matching/expansive responses also had longer child-initiated schemes ($r(32) = 0.427, p < 0.05$) and shorter parent-initiated schemes ($r(32) = -0.372, p < 0.05$).

Other parent behaviors between groups were examined to determine how play sequences were maintained. The longest sequence of play in each dyad was used to identify the defining characteristics of the best interaction. Parents of typical children imitated their children significantly more than parents of children with autism, $F(1, 30) = 4.12, p < 0.05$, in the longest sequence. Parent imitative acts made up 11% of the longest sequence in the dyads with typical children, whereas only 4% of the parent acts in the longest sequence are imitative acts in the dyads with the children with autism (Table 6). When examining the correlations by group, in the autism group only, imitation remained the distinguishing factor for both the parent and the child. Parents of children with autism who were able to achieve longer sequences of play had more parent imitative acts, $r(16) = .560, p < 0.05$, and child imitative acts, $r(16) = 0.632, p < 0.01$, overall. Furthermore, it seemed that if parents of children with autism can achieve longer play sequences, these sequences were nearly equal in duration to the sequences of typical children (average 219 s or 3½ min vs 251 s or about 4 min, respectively).

To understand the factors that end an interaction, the person responsible and the acts at the end of each play scheme were examined. Table 7 shows that typical children were ending a play scheme significantly more often than children with autism. For children with autism, 32% of all ending schemes were the result of a parent or a child with autism acting either too high or too low, whereas this only occurred in 10% of the endings for typical dyads.

Discussion

The aim of this study was to examine the similarities and differences in play interactions between dyads with and without a child with autism. As hypothesized, children with autism differed from

Table 6. Parent and child strategies that make up the longest sequences.

	Autism (%)	Typical (%)
Parent initiate acts	23	17
Child initiate acts	38	38
Parent prompts	13	8
Child imitates	21	26
Parent imitates	4	11*

* $p < 0.05$.

Table 7. Summary of the proportion of play acts that end schemes.

	Autism	Typical
Child ends	0.45*	0.69
Parent ends		
High/low/other	0.32**	0.10
Imitation	0.02	0.05

In children with autism, 0.20 of the schemes were made up of 1 child act and 0.17 of the typical children's schemes were made up of 1 child act.

* $F(1, 30) = 11.37, p < 0.01$.

** $F(1, 30) = 25.39, p < 0.001$.

cognitively matched typical children in their level of play, and child engagement was affected by specific parent interaction strategies. First, while children with autism demonstrated a mastered play level that was lower than typical children on the structured play assessment, nearly all the children demonstrated instances of higher levels of play. They also generally showed higher levels of play on the structured assessment than they did in interactions with their parents. These developmental findings are important because they help to set the context for why engagement with parents may be more or less successful.

Second, there are a number of noteworthy findings regarding parent strategies used in interaction with their children. First, joint engagement was maintained longer between dyads when parents engaged their child at or slightly above the child's current level of play and expanded their play within this level. Consistent with a Vygotskian theoretical view of the role of the more sophisticated partner, parents of children who maintained interactions within a zone of proximal development (at or just slightly above a child's ability) were more successful in keeping their children engaged (Rogoff, 1990). As predicted, parents of children with autism had much greater difficulty than parents of typical children in playing at or just above their child's play level. This difficulty relates to a host of potential issues. One may be the mismatch between children with autism's mental, chronological, and play levels. Thus, children with autism demonstrate play levels below their cognitive level (which is also below their chronological age), making it difficult for parents to judge what level to play at in order to keep their children engaged. Unlike parents of typical children who matched their level of play to their children, there was no association of parent and child play in the parent-child with autism dyads. Parents of children with autism tended to play at too high a level of play (thus perhaps more closely matching their child's mental age or chronological age) with the result being shorter periods of engagement. While other studies also note that periods of engagement between parents and children with autism tend to be shorter than with parents and typical children, this study suggests that this difficulty for parents may relate to their understanding of their child's current play level.

Parents who commanded their children to act or who controlled the play activity rather than the child also had play routines that were shorter. Parents of children with autism commanded and suggested more than parents of typically developing children. When children do not easily respond to parent engagement attempts, it is natural to command, to attempt to recruit the child's attention, and to "teach" the child. In terms of interactions, however, resorting to didactic-oriented teaching or interactions that are not balanced between adult and child may reduce mutually sustained interactions.

Third, in examining the longest play sequence for each dyad, a parent strategy that resulted in longer engagement was imitating the child's play acts. As previous studies have shown, adult contingent imitation can increase attention, social responsiveness, and complexity of play (Dawson and Adams, 1984; Dawson and Galpert, 1990; Dawson and Lewy, 1989). In this study, parents of children with autism who imitated their children more, and whose children in turn imitated the parent, had as long a play sequence as dyads with typical children.

In general, then, the results of this study suggest that less parent commanding and suggesting and playing at or just above the child's mastered play level results in longer periods of joint engagement. To be successful, parents must be aware of the level at which their children are playing, which may be below what they expect given the child's chronological age and mental age. Within a play episode, imitating the child's actions can extend the length of interaction. Thus, these particular strategies are important to implement in early interventions with parents and their children with autism. Indeed, some validation of these strategies is evident in a targeted intervention on play skills that resulted in higher play levels and greater diversity of play in preschoolers with autism (Kasari et al., 2006, 2010a). The key in this study was that playing within the child's zone of development (at or just above their mastered play level) resulted in greater engagement and increased children's play level and diversity of play through strategic parent interaction strategies.

It should be noted that the participants with autism in this study were already receiving intensive early interventions and were well-resourced families. Thus, a potential limitation is that participating parents in this study may interact with their children in different ways from parents who have fewer resources. Future research should examine the ways in which parents with different intervention histories may interact with their children. Nonetheless, this study adds to a growing literature on the importance of specific parental strategies to facilitate play and engagement for young children with autism. These data should also be useful in designing effective targeted interventions for parent-mediated interventions for children with autism.

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