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Mothers' Reports of Play Dates and Observation of School Playground Behavior of Children Having High-Functioning Autism Spectrum Disorders

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Abstract

Background—Children with high functioning autism spectrum disorders (ASD) are generally included with typically developing peers at school. They have difficulties interacting with peers on the school play ground. Previous literature suggests that having play dates in the home may be related to better peer acceptance at school.

Methods—This study examines the relationship between mother-reported play date frequency and amount of conflict, and peer interaction observed on the school playground for a sample of 27 boys and 4 girls meeting structured interview and observation criteria for ASD. Measures of intellectual functioning, adaptive behavior, and social skills were included in a stepwise regression analysis to account for their impact on relationships between maternal play date reports, general peer acceptance at school (as rated by the child's teacher) and observations of school playground behavior.

Results—Results revealed that children with autism spectrum disorders who had more play dates in their home tended to spend a greater amount of time engaged in behaviors such as mutual offering of objects, conversing and other turn taking activities with peers on the school playground. They also received more positive responses to their overtures from peers. These relationships remained highly significant even after accounting for other demographic, general social, and cognitive variables.

Conclusions—The present results suggest that play date frequency is strongly related to school playground behavior. Due to the design of this study, future research must assess whether play dates in the home promote better peer relationships on the playground or the reverse. In either case, the assessment of play dates, as well as observation of spontaneous unsupervised social interactions are important outcome measures to consider in social skills interventions for children with high functioning ASD.

Keywords

Social Skills; Autism; Asperger's Disorder; Friendship

Children with Asperger's Disorder or High Functioning Autism (ASD) have been observed to initiate and reciprocate peer interactions much less frequently than language–matched children with developmental disabilities (Hauck, Fein, Waterhouse, & Feinstein, 1995). Hauck et al. reported that the frequency of initiations to peers was unrelated to severity of

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autism, but was related to cognitive skills, including vocabulary and comprehension of affect. However, the observations were made in a special education classroom with few other peers initiating social interactions.

Placement in regular classrooms may provide peers who more reliably initiate social interactions. However, such placement has been a mixed blessing for children with ASD (Burack, Root, & Zigler, 1997). On the one hand, placement in the regular classroom has been associated with increases in the complexity of the play of children with ASD and decreases in nonsocial activity when compared to how they behave in special education settings (Sigman & Ruskin, 1999). On the other hand, perhaps because these children are aware of their social limitations, they report feeling lonelier and having poorer quality friendships (Capps, Sigman, & Yirmiya, 1996) than their typically developing classmates (Bauminger & Kasari, 2000). In the absence of additional treatment, placement together with typically developing children has not been shown to increase the social interaction of children with ASD (cf., McConnell, 2002).

In addition to deficits in social interaction at school, most children with ASD also lack a best friend. Best friendships among typically developing children become stable by about the fourth grade (Frankel, 2010; McGuire & Weisz, 1982). Sigman and Ruskin (1999) noted that only 27% of school-aged children with ASD had a best friend, compared with 41% of children with other developmental disabilities. Among children with ASD who reported having a best friend, the results of Bauminger et al. (2008) suggest that children with ASD may show greater social benefit from best friendships with neurotypical children than with other children with disabilities. These "mixed" friendships were "…found to be more durable and stable and to exhibit higher levels of goal oriented social behaviors and positive affect. Friends in mixed dyads were more responsive to one another; showed higher levels of positive social orientation and cohesion, and demonstrated a more complex level of coordinated play than those in non-mixed dyads." (p.1224)

Having a best friend may provide numerous advantages for the child with ASD. Among neurotypical children, having one or two best friends is of great importance to later adjustment, can buffer the impact of stressful events (Miller & Ingham, 1976), and correlates positively with self-esteem and negatively with anxious and depressive symptoms (Burhmester, 1990).

Best friends may promote the development of social competence: while conflicts with acquaintances can decrease subsequent social interaction, conflicts among best friends and their resolution are associated with subsequent increases on measures of social problem solving (Nelson & Aboud, 1985). In a study looking at conflict resolution between neurotypical children, Nelson and Aboud found that two children who were best friends employed more explanations of their position, sought more information from each other, and were apt to arrive at a more mature solution than two children who were acquaintances. These results on neurotypical children are consistent with the findings of Bauminger et al. (2008) for the best friendships of children with ASD in that best friendship promote more advanced social behavior in both populations.

Growth in social competence with age may be especially difficult for the child with ASD, since the natural development and transmission of necessary peer etiquette requires generally positive and sustained interaction with peers and learning from best friends. Continued isolation makes deficits in the knowledge of peer etiquette more obvious as the child with ASD gets older. Not surprisingly, as adults, many individuals with ASD consequently lack community connections and friendships that are taken for granted by typically developing persons (Baxter, 1997).

Play dates (prearranged play sessions between only two children at the home of one of the children) are ubiquitous in our society among neurotypical elementary school-aged children (Ladd, 1992; Parke & Bhavnagri, 1989) and are thought to make an important contribution to the formation and maintenance of best friendships (Frankel, 2010; Frankel & Myatt, 2003; Gottman, 1983). Reports of play date prevalence are consistent across studies: Newson and Newson (1976) reported that 72% of upper middle class families arranged play dates for their children. Lougee and Kenniston (reported in Gottman, 1983) found the prevalence of arranged play dates among six to eight year-olds to be about 55% of boys and 90% of girls. Ladd and Hart (1992) reported a play date prevalence of 81%.

Parents of neurotypical children who invite their child's peers into their homes have children who are invited to more play dates at peers' homes (Ladd, Hart, Wadsworth, & Golter, 1988), have children with a larger range of playmates and more consistent play partners (Ladd & Golter, 1988) and have children with closer and more stable friendships (Krappman, cited in Ladd & Hart, 1992). In order to be instrumental in promoting friendship between children, the frequency of play dates must be sufficient to maintain dependable contact (Frankel & Mintz, 2010). In addition, the absence of conflict has also been found to be critical (Ladd, 1992; Gottman 1983) in promoting continuing reciprocity of invitations for playdates.

The purpose of the present study was to assess the relationship between play date frequency and amount of conflict, with peer interaction observed on the school playground. It was hypothesized that children with less conflict and more frequent play dates would have more friends at school and this would be reflected in more positive peer interaction on the playground. Measures of general and specific social and intellectual functioning were included in the analysis to account for these factors in relationships obtained between play dates and school playground behavior.

Methods

Participants

Twenty-seven boys and 4 girls who had high functioning ASD were recruited from September 2003 to March 2008 as part of a larger treatment outcome study. Twenty-nine participants were completely mainstreamed and 2 participants had special education services for part of the day. Ethnic distribution for participants was 23 Caucasian, 3 Asian, 2 African American, 1 Hispanic, 1 Pacific Islander and 1 Native American. The university and the NIMH institutional review boards approved all procedures. Informed consent was obtained from parents and assent from children. All parent questionnaires were completed by the child's mother.

Measures

Eligibility Measures

The Autism Diagnostic Interview-Revised: (ADI-R; Lord, Rutter, & Le Couter, 1994) is a structured interview carried out with the parent or caregiver of the participant. It queries behaviors related to the core domains of abnormality as defined in the DSM-IV and ICD-10 diagnostic criteria: social relatedness, communication and language, and restricted interests/ repetitive behaviors. It consists of 111 questions and takes 2–3 hours to administer. Each question was scored on a Likert scale ranging from typical behavior to abnormal behavior. Diagnosis is determined by a well-validated algorithm (Rutter, Lord, & Le Couter, 1995) consisting of a subset of questions combined into scores on the core domains. All participants in the present study met or exceeded the thresholds for each of the core domains as well as age of onset.

The Autism Diagnostic Observation Schedule–Generic: (ADOS-G; Lord et al. 2000) is a companion tool to the ADI-R. It is a semi-structured observation session used to observe the participant directly for deficits and behaviors related to the core domains of autism (see Lord et al. for more information). The items related to restricted interests or repetitive behaviors are included in the scoring but not required for diagnostic categorization, since it is possible that in the short period of observation these would not be elicited.

Predictor Variables

Vineland Adaptive Behavior Scales-Survey Form: (VABS; Sparrow, Balla, & Cicchetti, 1984). The VABS is a measure of adaptive behavior skills needed for everyday living for individuals and provides an assessment of functioning within the domains of communication, daily living skills, and socialization. The VABS took approximately 30 minutes to complete. The Communication and Socialization scores were selected as being most relevant to the present analysis. Parents rated the degree to which their child exhibited each behavior item as either “Never,” “Sometimes/Partially,” or “Usually.” Content validity has been established for each domain of the VABS (Sparrow et al. 1984). Split-half reliability ranged from .80 to .92 for Communication and .78 to .86 for Socialization for the age ranges employed in the present study. Test-retest reliability ranged from .77 to .87 for Communication and .76 to .80 for Socialization.

Wechsler Intelligence Scale for Children—3rd revision: (WISC-III; Wechsler, 1991) All children were administered all verbal subtests, which were used to derive their Verbal IQ scores.

The high functioning Autism Spectrum Screening Questionnaire: (ASSQ; Ehlers, Gillberg, & Wing, 1999) is a 27 item checklist completed by the mother. Items are rated on a 3-point scale (0= normality; 1= some abnormality and 2=definite abnormality). The ASSQ was used as an index of severity of ASD. In order to establish discriminative validity, Ehlers et al. compared 21 children with autism spectrum disorders, 34 children with Asperger syndrome, 31 with learning disabilities, and 58 with Attention Deficit/Hyperactivity Disorders. Test-retest reliability over a two week period was $r = .96$ for parents, correlation between parent and teacher ratings was $r = .66$ (Ehlers et al. 1999). The ASSQ was used as a measure of severity of autism.

Social Skills Rating Scale - Parent: (SSRS; Gresham & Elliott, 1990). The SSRS took approximately 10 minutes to complete. The items were rated as either “Never,” “Sometimes,” or “Very Often.” The Social Skills and Problem Behaviors scales were derived from factor analysis. The Social Skills scale (38 items) assessed interactions with age mates (19 items, e.g., “Responds appropriately when hit or pushed by other children”), adults (13 items, e.g., “Ends disagreements with you calmly”), performance of household tasks (4 items, e.g., “Keeps room clean and neat without being reminded”), and use of free time (2 items, e.g., “Uses free time at home in an acceptable way”). The Problem Behaviors scale has three major domains: externalizing (6 items, e.g., “Fights with others”), internalizing (5 items, e.g., “Is easily embarrassed”), and hyperactive behaviors (6 items, e.g., “Acts impulsively”). The SSRS was employed as an index of general social skill.

According to Gresham and Elliott (1990), coefficient alpha for the Social Skills scale was . 90 and for the Problem Behaviors scale was .81. Both scales correlated significantly with other established measures of child social and problem behaviors. Test-retest reliability was .65. Raw scores were retained for the Social Skills scale and standard scores were used for the Problem Behavior scale.

The Pupil Evaluation Inventory - Teacher: (PEI; Pekarik et al. 1976) is composed of Withdrawal, Likability and Aggression scales. Correlations between peer and teacher ratings exceeded .54 on all scales (Ledingham, Younger, Schwartzman, & Bergeron, 1982). These scales have predictive validity. PEI assessments in first grade have been shown to predict of antisocial behavior 7 years later (Tremblay, LeBlanc, & Schwartzman, 1988) and to accurately classify peer acceptance (La Greca, 1981; Ledingham & Younger, 1985). The PEI was completed by the child's teacher and was used as an index of overall peer acceptance.

Quality of Play Questionnaire - Parent: (QPQ; Frankel & Mintz, 2010) is a measure of the quality of the last play date and the frequency of play dates. The QPQ consists of 26 items administered to parents to assess the frequency of play dates with peers over the previous month, the types of activities in which the children engaged and the level of conflict during these get-togethers. The 10 items which make up the Conflict scale ask for parent ratings of peer conflict (e.g., "criticized or teased each other") during play dates in their home. The last two items ask parents to report the number of invited (at another child's home) and hosted (at the participant's home) play dates the child had over the previous month.

The Conflict scale was developed through factor analysis of 175 boys and girls who were either clinic-referred or from a community sample. The coefficient alpha was .87. This scale also demonstrated convergent validity with the SSRS Problem Behaviors scale ($\rho = .35$, $p < .05$) and significantly discriminated a general community sample ($n = 112$) from children referred to social skills training ($n = 48$; $t = 2.55$; $p < .05$). Reported frequency of hosted and invited play dates also significantly discriminated community-referred from clinic samples (p's < .005). Conflict scale scores above 3.5 correctly classified 66.7% of clinic-referred children, while Conflict scale scores below 3.5 correctly identified 72.3% of the community sample. Less than 2.5 either invited or hosted play dates correctly classified 66.7% of the clinic sample. Greater than 2.5 invited or hosted play dates correctly classified 60.7% or 59.8% of the community sample.

Laugeson, Frankel, Mogil, and Dillon (2009) reported Spearman correlations between teen and parent ratings were .55 for the Conflict scale, .99 for the frequency of hosted get-togethers, and .99 for the frequency of invited get-togethers (deleting reports of "0" get-togethers resulted in correlations of .97 and .94, respectively, all p's < .001).

Playground Observation Measures

The Playground Observation of Peer Engagement: (POPE; Kasari, Rotheram-Fuller, & Locke, 2010), is a behavior coding system that was adapted from Sigman and Ruskin (1999). Observers were undergraduate laboratory assistants or graduate students in education. Observers arrived before the beginning of the recess period and began observations as soon as the participant was located on the playground. Observations continued until the end of the recess period. Data collected were based upon at least 15 minutes of observation for each participant.

Peer interactions on the playground were coded using one minute intervals. Interactive states were noted along with the presence or absence of discrete interactive behaviors during each coding interval (see below for definitions). The first 40 seconds of each minute were designated for observation and coding of number of discrete behaviors. The last 20 seconds of the interval were designated for coding interactive state. A stopwatch beep indicated the end of this observation period.

Coded Interactive States: The coded state is defined as the interaction level the participant displayed for at least 20 seconds. The definition of each interactive state is as follows:

Solitary: Participant plays alone, with no peers within 3 feet, and no mutual eye gaze with other children.

Proximity: Participant plays alone within 3-foot range of peer that is not engaged in a similar activity.

Onlooker: Participant has one-way awareness of another child engaged in an activity who is farther away than 3 feet and participant is not engaged in a similar activity.

Parallel: Participant and a peer are engaged in a similar activity but there is no social behavior.

Parallel aware: Participant and a peer are engaged in similar activity and mutually aware of each other during the activity.

Joint engagement: Participant and a peer engage in direct social behavior, e.g., offering objects, conversing, toy-taking, and other activities with a turn-taking structure.

Games with rules: Participant participates in organized games/sports with rules such as 4-square, and basketball.

Discrete behaviors: An instance of a discrete behavior was coded if it was observed any time during the first 40 seconds of the 1 minute interval. The definition of each discrete behavior is as follows:

Child Initiates: Participant directs communication to a peer—e.g., offers a toy, greets, asks to play a game.

Positive Response to Social Initiation (PRES): Peer responds to an overture of the participant with a gesture, or language.

Shared positive affect: Participant and peer smile/laugh while looking at each other or sharing the same activity.

To correct for varying intervals per observation, a total percentage of time was calculated for each measure. Coders were trained to reliability criteria of 90% for each category, using live training sessions. Twenty percent of all observations were coded by two observers to maintain reliability. Weekly discussions were held to minimize observer drift. The average ICC between for these coding sessions was .88.

Procedures

Potential participants were derived from two sources: (1) Parents who called the outpatient clinic inquiring about the social skills program for their child were sent a packet of questionnaires to complete which included the ASSQ, SSRS and QPQ. After packets were returned and the child met preliminary screening criteria, parents were contacted to enquire about their interest in participating in the study. If interested, parent consent and child assent were obtained and the child was given a diagnostic evaluation by the UCLA Center for Autism Research & Treatment, Assessment and Evaluation Core (CART). This evaluation was composed of the ADOS-G, ADI-R, VABS and the WISC-III.

(2) Parents of children evaluated by the CART who met diagnostic criteria for ASD after the above evaluation were referred to the study. On calling study personnel, the study was explained to the parent. Parents who were interested in participation were scheduled for an initial visit in order to administer consent to the parent and assent to their child. The remaining measures (ASSQ, SSRS and QPQ) were then completed.

Children were eligible for the study if they met all of the following inclusion criteria:

1. The child satisfied ADOS-G and ADI-R criteria for autism spectrum disorder.
2. The child was currently attending a 2nd through 5th grade regular classroom for most of the school day without an aide or other closely supervising adult.
3. The child was not currently prescribed any psychotropic medication.
4. The child's Verbal IQ was greater than 80.
5. The child was able to switch topics in a conversation when the other person was interested in talking about something else.
6. The child had adequate knowledge of rules in playing at least 2 common age-appropriate board games (e.g., checkers, chess, etc).
7. The child had knowledge of rules to play common school yard games (e.g., handball, kickball, four square, tetherball, jump rope, etc).
8. The child did not have a thought disorder
9. The child was free of clinical seizure disorder, gross neurologic disease, or other medical disorder (e.g., moderately impaired hearing, or severe uncorrectable visual impairment).

Criteria 5–8 were established during a child mental status exam performed by the first author (cf., Frankel & Myatt, 2003). Upon meeting inclusion criteria, the PEI was obtained and POPE observations were conducted.

Results

Below we present basic sample characteristics, univariate correlations of social and play date measures with playground behaviors and finally joint predictive models of playground behaviors. Since this was an exploratory study with a relatively small sample size and we wanted to present all potentially important relationships, all tests are reported with uncorrected p-values. However we note that the primary finding concerning the play date measures survives correction for multiple comparisons.

Sample Characteristics and Preliminary Analyses

Table 1 presents the mean demographic, social, play date and playground variables for the study sample. Parent socioeconomic status (SES) was calculated using the procedure described by Hollingshead (1975). The present sample had substantial social deficits, as indicated by the mean Social Skill scale score on the SSRS (> 1 *SD* below average) and the mean VABS Socialization scale score (almost 2 *SD*s below average). The sample also had substantial conflict on play dates (the mean QPQ Conflict scale score was above cutting scores for the problematic range) and fewer invited and hosted play dates than a community sample (Means were within the problematic range for both hosted and invited play dates). Mean ASSQ scores indicated that parents reported symptoms at a level that would have misclassified less than 10% of the children without ASD (cf., Ehlers et al. 1999, Figure 3b). Mean PEI scores indicated substantial withdrawal and low likability.

Preliminary analyses revealed that the following play behavior categories were not observed to occur for more than 63% of participants: Proximity, Parallel, Parallel aware, Games with rules and Onlooker. These were eliminated from the subsequent analyses. The remaining four categories were observed to occur in more than 64.5% of participants.

First Order Correlations

Statistically significant first order correlations for each parent and teacher measure with playground behaviors are presented in Table 2. Inspection of the table reveals that both parent and teacher measures were related to playground behavior. Parent reports of hosted play dates showed the highest correlations to mutual interaction on the playground. The correlations in the table suggest that increases in mutual interactions on the play ground were related to greater frequencies of hosted and invited play dates (number of Hosted play dates with Joint Engagement, $r = .65$, $p < .001$; number of Hosted play dates with PRES, $r = .48$, $p < .01$; and number of Invited play dates with Joint Engagement, $r = .38$, $p < .05$). Higher teacher ratings of Withdrawal were related to increases in isolate behavior and decreases in mutual interactions on the playground (Withdrawal ratings with Solitary, $r = .36$, $p < .05$; with Joint engagement, $r = -.37$, $p < .05$) and marginally related to decreases in child initiations (Withdrawal ratings with Child Initiates, $r = -.32$, $p < .07$). Increases in teacher ratings of Likability were marginally related to decreases in isolate behavior on the playground (Likability ratings with Solitary, $r = -.35$, $p < .07$).

Stepwise Regression Analyses

Stepwise regression analyses were performed on each play behavior measure to understand the joint predictive power of impact of the demographic, social skills and play date variables. Specifically, we used “mixed” stepwise procedure in which variables were added working forwards from a null model but were allowed to exit the model if they subsequently became nonsignificant. There were no significant predictors of child-initiated behaviors. The final models for the other outcome measures are presented in Table 3. Frequency of hosted play dates was overall the best predictor of playground behavior. Participants who had more play dates in their home tended to engage for greater time in behaviors such as mutual offering of objects, conversing and other turn taking activities with peers (partial $R^2 = .43$, $p < .001$ in the model for Joint Engagement). They also received more positive responses to their overtures from peers (only Hosted play dates entered into the model predicting PRES, partial $R^2 = .23$, $p < .01$). Demographic measures, including verbal IQ did not significantly contribute to the joint predictive models for any of the playground observation measures. General social and general peer acceptance variables, when they did appear, contributed to a lesser degree (for Joint engagement, SSRS Social Skill $R^2 = .11$, $p < .01$ and PEI Withdrawal $R^2 = .07$, $p < .05$). Solitary behavior was predicted only by general level of socialization (VABS Socialization $R^2 = .21$, $p < .001$). In the models for Joint Engagement and PRES, number of hosted play dates was the first variable to enter, thereby potentially masking contributions of demographic and social skills variables that may themselves have been related to both play dates and playground behaviors. Therefore, to see whether play date information explained significant variability beyond the children’s more general characteristics we fit block stepwise models for these two outcomes in which demographic variables were entered first, followed by general social skills measures, and finally play date measures. Number of hosted play dates remained the most significant variable in each of these models. Since the results of the block stepwise regression analysis were consistent in qualitative interpretation and since overall these models were not as good as the ones presented in Table 3, these models are not presented.

Discussion

It was hypothesized that children with less conflict and more frequent play dates would have more positive peer interaction on the playground. This hypothesis was partially confirmed. Frequency of hosted play dates, but not conflict on play dates was related to rates of peer interaction on the school playground. First order correlations indicated that children with ASD who had more play dates in their home tended to engage for greater time in mutual in behaviors such as offering of objects, conversing and other turn taking activities with peers (joint engagement). They also received more positive responses to their overtures from peers. Frequency of hosted play dates showed the highest correlations with rates of peer interaction of any of the measures examined.

Teacher ratings were related to playground behavior but the correlations were lower than for the parent measures. Higher teacher ratings of withdrawal correlated with lower amounts of interaction with peers and more isolation from peers. Higher teacher ratings of likability correlated with less solitary behavior. Teacher ratings did not correlate significantly with either joint engagement or positive responses to overtures from peers.

Stepwise regression analyses revealed that the contribution of hosted play dates was most important in predicting joint engagement and positive responses to overtures from peers. These relationships remained highly significant even after accounting for other demographic, general social, and cognitive variables, including verbal IQ. None of the teacher measures contributed to the model for positive responses to overtures from peers and was the smallest contributor to the model for joint engagement (behind hosted play dates and SSRS social skill).

Mean demographic indices suggested that participants in this study were typical of children with high-functioning ASD who were integrated into mainstream classrooms. They had substantial symptoms of ASD on the ASSQ and social deficits on the SSRS. They also showed greater play date conflict, fewer hosted and invited play dates than a community sample. Teachers reported substantial withdrawal and low likability.

Although Frankel & Mintz (2010) reported conflict on play dates to be greater for neurotypical children referred for social skill straining than for those in a general community sample, this scale did not significantly correlate with interaction on the playground. It seems that the most important contribution of play dates to the development of friendship was their persistence rather than their quality. It is possible, for instance, that the participants who played regularly with other children on play dates would rate the quality of these relationships across a wider range, with some characterized as lower quality and more conflict, but nevertheless fostering more interaction on the playground. Future research must explore this inconsistency.

The present study had several limitations. First, observers did not note how many or which peers interacted with study participants on the playground. Greater degrees of mutual social interaction on the playground could have been due to positive interactions with one or two peers and not indicative of more widespread acceptance by the peer group. This could account for the weaker relationships found between teacher ratings and playground measures as teachers may have been more attuned to general levels peer acceptance in the classroom than positive interactions on the play ground.

Another limitation was the correlational nature of this study. The present results may have been obtained either because: (a) acceptance by peers at school encouraged parents of children with ASD to invite more children to their homes for play dates, (b) more hosted play dates improved peer acceptance at school, or (c) children who were at higher social or

cognitive levels had more play dates and better acceptance at school. Since significant contributions of either cognitive or social measures were not found, alternative (c) is not supported by the present results.

Other limitations of the present study were that the sample was composed of high functioning children with ASD and results may not apply to children with ASD in lower ranges of functioning, children younger or older than study participants, and non-Caucasian populations. The observations were based upon relatively brief time periods, so that the stability of these observations also needs to be investigated.

Conclusions

Improving the quality and increasing the frequency of play dates are outcomes that have largely been overlooked in social skills studies. Having more play dates may be an important outcome of social skill training as frequent play dates are normative for neurotypical children (Ladd & Golter, 1988; Ladd & Hart, 1992; Newson & Newson, 1976) and may result in the formation and maintenance of best friendships (Frankel, 2010; Frankel & Myatt, 2003; Gottman, 1983). The results of the present study suggest that assessment of play dates as well as observation of spontaneous unsupervised social interactions are important outcome measures to consider in social skills interventions for children with high functioning ASD.

The treatment implications of this study differ with the directionality of the relationships between play dates at home and peer interaction on the school playground. If acceptance by peers at school may encourage parents of children with ASD to invite more children to their homes for play dates, then a focus upon building social skills at school might be the preferred method of improving peer relationships in children with ASD. A comprehensive school-based social skills training program such as Baker (2003) may therefore result in more play dates outside of school. On the other hand, if more hosted play dates improves peer acceptance at school, programs which encourage parents to get children together for these play dates would be important in improving peer relationships on the playground. In order to establish that improvements in hosted play dates impact peer interaction in the playground, interventions should target increases in play date frequency and quality and assess subsequent generalized impact on peer relationships.

Some researchers have included play dates as a target of intervention (e.g., Koegel, Werner, Vismara, & Koegel, 2005; Wood et al. 2009). Children's Friendship Training (CFT; Frankel & Myatt, 2003) also targets expanding friendship networks and improving good host behavior during play dates. Recently, a randomized controlled trial was reported on 68 children with ASD who were given either CFT or a delayed treatment control group (DTC; Frankel et al. 2010). At post-testing, the CFT group was superior to the DTC group on parent measures of social skill and play date behavior, and child measures of popularity and loneliness. At 3-month follow-up, parent measures maintained significant improvement from baseline. However, Frankel et al. did not find significant changes in teacher reports for the intervention and did not report observations on the school playground. Future research is currently being designed to include more detailed play observations to establish if this intervention generalizes to the playground and which, how many and the diagnostic status of peers who are involved in such generalization.

- Children with high functioning autism spectrum disorders have difficulties interacting with peers on the school play ground.
- Having play dates in the home has been noted to improve peer relationships of neurotypical children at school.

- This study found that children with autism spectrum disorders who had more play dates in their home tended to spend a greater amount of time engaged in behaviors such as mutual offering of objects, conversing and other turn taking activities with peers on the school playground. They also received more positive responses to their overtures from peers.
- Future research must assess whether play dates in the home promote better peer relationships on the playground or the reverse.
- In either case, the assessment of play dates, as well as observation of spontaneous unsupervised social interactions are important outcome measures to consider in social skills interventions for children with high functioning ASD.

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Table 1

Means and Standard Deviations for Demographic, Social, and Playground Measures for the Study Sample.

Measure	Mean	S.D.
Age (months)	98.9	13.4
Grade	3.1	0.9
SES	44.1	11.4
Percent Male	87.1	--
Percent Caucasian	74.2	--
WISC-III Verbal IQ	108.3	17.2
ASSQ	20.5	7.9
VABS		
Communication	84.2	19.5
Socialization	65.7	10.5
QPQ		
Host[1]	2.2	2.4
Guest[1]	1.7	1.9
Conflict	4.5	4.4
SSRS		
Social Skills	37.8	10.0
Problem Behaviors	111.5	13.4
PEI		
Withdrawal	4.1	2.1
Likability	1.4	1.6
Aggression	1.0	1.4
Playground behaviors		
Solitary	.33	.37
Joint Engagement	.27	.32
Child Initiates	12.5	11.4
PRES	.23	.19

[1] n = 30

Table 2

Statistically Significant First Order Correlations of Observed Playground Behavior Frequencies with Predictor Variables.

	Behavior Code			
Predictor Variable	**Solitary**	**Joint Engage**	**Child Initiates**	**PRES**
Parent measure				
Invited play dates	--	.38**	--	--
Hosted play dates	−.34*	.65****	--	.48***
Teacher measure				
Withdrawal	.36**	−.37**	−.32*	--
Likability	−.35*	--	--	--

* >05 < p < .07;

** p < .05;

*** p < .01;

**** p < .001

Table 3

Final Models for Prediction of School Playground Behaviors

	Overall F	Parameter estimate	Standard error	R^2 (partial R^2)
Solitary	7.56^{**}			.21
VABS Socialization[1]		$-.016^{**}$	.006	(.21)
Joint Engagement[2]	13.57^{***}			.61
QPQ[1] Hosted play dates		$.08^{***}$	.015	(.42)
SSRS[1] Social Skill		$.01^{**}$	.004	(.11)
PEI[1] Withdrawal		$-.34^{*}$	.157	(.07)
PRES[1]	8.22^{**}			.23
QPQ[1] Hosted play dates		$.038^{**}$	.013	(.23)

$^{***}p < .001$

$^{**}p < .01$;

$^{*}p < .05$.

Notes:

[1]VABS= Vineland Adaptive Behavior Scale; QPQ = Quality of Play Questionnaire; SSRS= Social Skills Rating Scale; PEI= Pupil Evaluation Inventory; PRES= Peer response to social initiation.

[2]For Joint Engagement, variables are shown in order of entry into the stepwise regression and the partial R^2 values represent the additional proportion of variability explained when that variable was added to the model.