

The friendships of young children with developmental delays: A longitudinal analysis[☆]

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Abstract

This longitudinal study examined the social interactions of children with mild developmental (cognitive) delays with friends across the early childhood and early elementary years. Results revealed increases in many forms of social exchange with effect sizes in the moderate range, but no changes in sustained interactive play. Social interaction patterns, difficulties in identifying friends to participate in the study, and concerns evident in children's peer and friendship networks suggest the general absence of reciprocal friendships. These findings are consistent with the hypothesis that children's limited peer-related social competence constrains all aspects of their development of friendships. Despite these problems, the potential benefits of interventions designed to support relationships at this stage of friendship development for children with delays were noted.

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1. Introduction

Friendships play a central role in children's relationships, are characterized by high levels of reciprocity, mutuality, and affect, and provide a context that supports numerous aspects of a child's development (Bukowski, Newcomb, & Hartup, 1996; Hartup & Sancilio, 1986; Hartup & Stevens, 1997; Rubin, Coplan, Chen, Buskirk, & Wojslawowicz, 2005). Both the characteristics defining friendships and the functions of friendships are apparent even during the early childhood years (Howes, 1986; 1988). With respect to function, evidence suggests that friendships established during this period create a valuable context affording important opportunities to learn and practice skills essential to children's social, cognitive, communicative, and emotional development. The influence of friendship on young children's emerging socially competent behavior patterns has produced particularly consistent findings. Specifically, friend versus non-friend play comparisons have indicated that social play with friends is characterized by more positive affect, higher levels of social interactions, and more effective forms of conflict management (Hartup, Laursen, Stewart, & Eastenson, 1988; Hinde, Titmus, Easton, & Tamplin, 1985; Ladd, Kochenderfer, & Coleman, 1996; Newcomb & Bagwell, 1995, 1996).

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Both conceptually and empirically, a close association exists between children's social competence and friendships across the life span (Hartup & Stevens, 1997; Howes, 1988). Having at least one reciprocal friend is positively associated with social competence. Children with more reciprocal friends have higher levels of social competence, and friendship dyads are characterized by more socially competent play than non-friend dyads (Lindsey, 2002; Vaughn et al., 2000; Vaughn, Colvin, Azria, Caya, & Krzysik, 2001). It is likely that this association reflects a complex process that evolves over time in which children's competence supports friendship development which, in turn, supports the further development of competence (see Newcomb & Bagwell, 1996; Rubin, Bukowski, & Parker, 2006). Of importance, recent longitudinal research suggests that positive aspects of friendships occurring during the early elementary years, especially the number of friends, are predicted by children's social competence evident during early childhood (NICHD Early Child Care Research Network, 2006).

Studies of the social play interactions of preschool-age children with mild developmental (cognitive) delays have revealed well-documented and unusual problems with respect to their peer-related social competence. Specific difficulties in social information processing and emotional regulation adversely affect numerous aspects of these children's social competence with peers, yielding unusually fragile and low levels of interactive or group forms of social play among other features (see Guralnick, 1999, for a review). The cognitive levels of children with mild developmental delays range from one to three standard deviations below the mean on standardized tests of intellectual development, and children exhibit considerable stability in cognitive functioning over time (Bernheimer & Keogh, 1988; Keogh, Bernheimer, & Guthrie, 1997; Vig, Kaminer, & Jedrysek, 1987). As might be expected, difficulties establishing friendships are especially apparent for these children. Compared to chronologically and developmentally matched groups of typically developing children and to children with communication disorders in playgroup settings, observational studies have revealed that young children with mild developmental delays rarely form reciprocal friendships (Guralnick, Gottman, & Hammond, 1996; Guralnick & Groom, 1988). Of importance, most children with delays do develop preferences to interact with specific children during the early childhood period (i.e., meet criteria for non-reciprocal friendships). However, in contrast to typically developing children (Newcomb & Bagwell, 1995; Vaughn et al., 2001), children with delays who do form either non-reciprocal or reciprocal friendships do not engage in more socially interactive play with those peers in comparison to play with non-friends (Guralnick et al., 1996; Guralnick & Groom, 1988). This includes children's level of involvement in group play, a process requiring sophisticated interactive skills, as no increases during play with friends have been found for this measure. These studies suggest that the unusual difficulties in the peer-related social competence of children with developmental delays not only limit their ability to establish reciprocal friendships during the early childhood period, but may also affect their ability to take advantage of the opportunities occurring even when interacting with playmates they prefer.

Assessments of community-based friendship networks of children with mild developmental delays during early childhood are consistent with laboratory-based observational studies of friendships. Based on parent and teacher reports, the existence of friendships and more in-depth social contact with peers is more limited for children with delays than for typically developing children, although the general peer social networks of children with delays exhibit many similarities to those of their non-delayed peers (Buysse, Goldman, & Skinner, 2002; Geisthardt, Brotherson, & Cook, 2002; Guralnick, 1997). In the vast majority of instances, typically developing children are identified as friends of children with delays (e.g., Freeman & Kasari, 2002; Guralnick, 1997).

General problems related to friendship and social competence extend beyond the early childhood period for these children (Leffert & Siperstein, 2002). School-age children with delays, in particular, frequently report high levels of loneliness and isolation (Howell, Hauser-Cram, & Warfield, 2001; Luftig, 1988; Margalit, 2004; Williams & Asher, 1992). Moreover, recent evidence suggests that young children with delays display only modest increases in peer-related social competence as they transition to the kindergarten and early elementary years, with a substantial proportion of children showing no growth at all (Guralnick, Hammond, Connor, & Neville, 2006). Nevertheless, it may well be that advantages of friendship in any form (reciprocal or unilateral) may become more apparent over time despite continuing problems in children's general social competence. Evidence does indicate that for a specific subgroup of children with delays, those with Down syndrome, older children interacting with friends may benefit from some aspects of a friendship relationship (Freeman & Kasari, 2002).

Specifically, for children with mild developmental delays beyond the early childhood period, it is quite possible that the repeated experience of the structure and perhaps script-like characteristics common to play with familiar playmates, especially those identified as friends, may be able to compensate to some extent for children's ongoing social competence difficulties (Nelson, 1981). Particularly in conjunction with the emergence of more advanced cognitive

and language abilities over time, both the quality and quantity of social interactions with friends may well increase substantially as children move beyond early childhood. If this is the case, such information will be useful from an intervention perspective, particularly if more detailed analyses of the most optimal circumstances supporting friendships, such as the friends' characteristics or the nature of the relationship, are carried out.

Alternatively, in view of the apparent close association between children's social competence and friendships, both the formation of reciprocal friendships and the benefits of friendships occurring in any form may well continue to be limited for these children over time. Even children with delays who do establish friendships as they move beyond the early childhood period may experience only minor improvements in their ability to interact socially during play with friends and, more specifically, engage in complex forms of interactive sequences.

Accordingly, to evaluate these competing hypotheses, we conducted a longitudinal study to examine changes in social play with friends for a group of children with mild developmental delays across the preschool, kindergarten, and early elementary school years. Special emphasis was placed on determining the existence of friendships, the identity of children's friends, and the quality of those friendships within the general context of the peer-related social competence of children with delays (see Hartup & Stevens, 1997). Specifically, mothers of children with delays were asked to identify and bring a "good friend" of their child's to participate in laboratory play sessions at the beginning of the preschool or kindergarten year and then again two years later. Given the expected difficulties these children experience forming reciprocal friendships, we required only that the friends selected by the mother meet criteria emphasizing those children that their child played with and asked about most frequently. Comprehensive assessments of the social play interactions of the children were then obtained from detailed observational measures at both time points. Specifically, information was obtained on various aspects of peer social interactions including positive and negative exchanges, the success of social bids, the responsiveness of the child with a delay to the social bids of the friend, and especially the extent of sustained interactive play.

Relatedly, we examined the characteristics of the friends who did participate in order to determine the most optimal conditions for social play interactions. Variables of interest were the chronological age differences and the sex composition of the dyads, the length of relationships, and the friend's disability status. Available research based on interactions between children with delays and identified friends suggests that same sex, similar chronological age dyads, friends who have more extensive experiences with one another, and children who are typically developing rather than those who also have a developmental delay are associated with higher levels of social interactions (Freeman & Kasari, 2002; Guralnick & Groom, 1987a). Nevertheless, social interactions with identified friends who are typically developing often display asymmetrical rather than balanced interaction patterns with far less mutuality and reciprocity than found in friendship relationships of only typically developing children, suggesting that these friendships may have different meaning for children with delays (Freeman & Kasari, 2002; Siperstein, Leffert, & Wenz-Gross, 1997).

Finally, we examined more general aspects of the peer and friendship networks of children with delays over time. Based on parent report, information was obtained with respect to the extent to which children were involved with peers in their community, including the number of playmates, information about best friends, the frequency with which play occurred, the quality of the relationships, and the amount of time spent with playmates. We also obtained information with respect to the characteristics of children identified as friends in this broader network, including whether they were relatives, their chronological age, sex, disability status, and information about the relationship itself, particularly the length of the relationship. Analyses of the changing pattern of children's friendship networks and the characteristics of the children identified as friends by children with delays over time, including those involving the friends brought to the laboratory play sessions, were designed to provide insight into the nature of the friendships of children with delays from the perspective of the reciprocity and mutuality of the relationship. This information, and related information, is relevant to our understanding of the influence of peer social competence on friendships and in providing direction for the design of intervention strategies.

2. Method

2.1. Participants

Young children with mild developmental delays (focal children) participating in inclusive (mainstreamed) programs were recruited through contact with local school districts in a large metropolitan community. To be included in the sample a child had to meet the following criteria: (1) be between 48 and 78 months of age, (2) have a current Individual Education Program for children with special needs, (3) be experiencing difficulties in peer-related social competence as expressed by parent concerns in a structured phone interview, (4) have a primary female caregiver (minimum of a 6-month relationship, as mothers

were our primary informants), and (5) obtain a Full Scale IQ (*FSIQ*) score between 50 and 80 on the Wechsler Preschool and Primary Scale of Intelligence-Revised (WPPSI-R; Wechsler, 1989). In addition to child demographic information, standard demographic information about the family (marital status, ethnicity, educational and occupational status, and income) was gathered via self-reports from mothers. The *Hollingshead Four Factor Index of Social Status* (Hollingshead, 1975) was used to calculate a measure of family social status (range 8–66; see Table 1 for descriptive characteristics).

A number of exclusionary criteria also were established. Based on the Child Behavior Checklist (CBCL; Achenbach, 1991) completed by the mother (or other female caregiver) for each child (reported in a subsequent section), children who scored in the clinical range were excluded from the study. A *T*-score above 70 was established for children with developmental delays to adjust to items focusing on developmental functioning. Only two children were excluded on this basis as a phone screening interview for mothers had eliminated six children described as exhibiting major behavior problems. Similarly, exclusion occurred if mothers scored at or above the 95th percentile on the Parent Domain of the Parenting Stress Index (Abidin, 1995). Three participants were excluded based on this criterion. Finally, children were excluded if English was not their primary language or if they had significant sensory or motor problems. No children were excluded on this basis.

A final sample of 63 participants (45 boys, 18 girls) initially enrolled in either preschool or kindergarten met our criteria (see Table 1). Following the initial assessments, focal children were randomly assigned to an intervention or control

Table 1
Measures of focal child and family characteristics at friend observations

	Time 1		Time 2	
	<i>M</i> or %	<i>SD</i>	<i>M</i> or %	<i>SD</i>
<i>Child demographics</i>				
Age (months)	63.52	7.65	83.75	7.54
Sex (% male)	71.4%			
Ethnicity (% Caucasian) ^a	73.0%			
<i>Grade in school</i>				
Preschool	52.4%		4.8%	
Kindergarten	47.6%		52.4%	
First Grade	0.0%		42.9%	
<i>Child characteristics</i>				
Full scale IQ (WPPSI-R or WISC-III) ^b	66.43	9.43	69.56	13.33
TACL-R total scale ^c	68.38	15.73	66.59	21.10
EOWPVT-R expressive language ^d	77.87	12.73	85.08	17.82
VABS adaptive behavior composite ^e	69.81	8.81	76.15	11.01
CBCL total behavior problems ^f	58.21	6.61	55.56	8.84
<i>Family demographics</i>				
Family social status ^g	51.46	13.01		
Mother's age (years)	37.06	5.05		
Marital status (% partnered)	92.1%			
<i>Parent stress and support</i>				
PSI parent domain ^h	124.63	24.70	120.36	25.90
IPE total support (5 sources) ⁱ	2.87	.41	2.93	.38

Note. *N* = 63.

^a Black, 1.6%; Hispanic, 4.8%; Asian, 6.3%; Native American, 1.6%; Biracial, 12.7%.

^b Wechsler Preschool and Primary Scale of Intelligence—Revised or Wechsler Intelligence Scale for Children.

^c Test of Auditory Comprehension of Language—Revised, standard scores.

^d Expressive Oral Word Picture Vocabulary Test—Revised, standard scores.

^e Vineland Adaptive Behavior Scales, standard score.

^f Child Behavior Checklist, *T*-scores.

^g Hollingshead Four-Factor Index of Social Status.

^h Parenting Stress Index, total raw scores.

ⁱ Inventory of Parental Experiences, total score.

condition at time 1 as part of a larger study investigating the effects of a comprehensive intervention intended to promote children's peer-related social competence (see Guralnick, Connor, Neville, & Hammond, 2006, for details). Although the intervention was not specifically designed to promote friendships, this variable was the focus of analysis in the present study.

A central feature of this study was to evaluate change and stability in the peer-related social interactions of individual children with their identified friends over time. However, mothers of 21 of the 63 children in the original sample were not able to identify a good friend to participate in the laboratory play sessions at both time points (17 at time 1, 11 at time 2). Accordingly, only 42 children (30 boys, 12 girls) were included in the peer interaction component of the study.

Information with respect to the focal child's diagnosis was also obtained. Because the diagnostic status of children with mild developmental delays is subject to change over time, parents provided information at the end of the study (two years later). Most children received only categorical diagnoses (e.g., static encephalopathy or developmental delay) or no diagnosis whatsoever, with meaningful etiologic diagnoses infrequently reported.

2.2. Friends of focal child

Mothers of each focal child were asked to identify a "good friend" of their child's and to bring that child to the laboratory to participate in two play sessions at each time point. These laboratory play sessions were scheduled at the convenience of the participants at the time of initial recruitment (time 1) and again two years later (time 2). As told to the mother, a good friend was considered to be a child with whom the focal child played with the most or asked about the most. The good friend could be either male or female and was required to be within two years of the focal child's age. Relatives not living in the home could be identified. Developmental status of the friend was not a concern.

At each time point, information was gathered regarding the friend's age, sex, and ethnicity. In addition, we determined whether the friend was a relative of the focal child and if he or she was receiving any special needs services in school and, if so, whether any diagnostic information was available. A measure of the friend's family's social status (Hollingshead, 1975) was also obtained. Further details about the friend (e.g., length of relationship, time spent together) was obtained from measures included in the assessment of children's peer social networks.

2.3. Child measures

Psychologists with extensive prior experience working with young children with developmental delays evaluated the focal children. The following child measures were administered: (1) *Wechsler Preschool and Primary Scale of Intelligence — Revised* (WPPSI-R; Wechsler, 1989). The Full Scale IQ (*FSIQ*) score was of primary interest. Older children were assessed with the *Wechsler Intelligence Scale for Children — Third Edition* (WISC-III; Wechsler, 1991). The standard battery of tests (5 verbal and 5 performance) was administered; (2) *Test for Auditory Comprehension of Language — Revised* (TACL-R; Carrow-Woolfolk, 1985). Although the TACL-R yields four standardized scores, only the total score was used in the analysis; and (3) *Expressive One Word Picture Vocabulary Test — Revised* (EOWPVT-R) (Gardner, 1990). The obtained raw score was converted to a standard score that was used for analysis.

To provide an estimate of children's adaptive behavior, trained interviewers administered the *Vineland Adaptive Behavior Scales* (Sparrow, Balla, & Cicchetti, 1984) Survey Form to each mother (or primary female caregiver, but hereafter referred to only as mother). Items are wide ranging, assessing adaptive behavior in each of four domains: communication (e.g., "relates experiences when asked"), daily living skills (e.g., "dries self with towel without assistance"), socialization (e.g., "participates in at least one game or activity with others"), and motor skills (e.g., "opens and closes scissors with one hand"). Only the total adaptive behavior score was used for analysis. The alpha coefficient for this study, averaged across the four domains, was .75.

Mothers also assessed their child's behavior problems based on the *Child Behavior Checklist* (CBCL; Achenbach, 1991). Mothers rated the frequency of different behavior problems (e.g., "argues a lot") from a 118-item questionnaire using a 3-point scale. Only the total score was used for analysis. The alpha coefficient for this sample was .87 for total behavior problems.

2.4. Parent measures

Mothers completed the *Parenting Stress Index* (PSI, Abidin, 1995), which yielded an overall estimate of parenting stress. The PSI is a 101-item questionnaire which yields scores for child and parent domains that differentiate sources

of stress with good discriminant validity (Bigras, LaFreniere, & Dumas, 1996). Only the Parent Domain was included in this study ($\alpha = .89$; test–retest = .81 from standardization sample) and focuses on mothers' reactions to the experience of being a parent (e.g., "Being a parent is harder than I thought it would be" or "Since having my child, my spouse and I don't do as many things together). Mothers completed a 5-point Likert scale ranging from strongly agree to strongly disagree for each item. The PSI Parent Domain score is computed as the sum of 54 items in seven subscales (e.g., sense of competence, social isolation) yielding a total score that can range from 54–270. Summing across the seven subscales, the Parent Domain represents perceived adverse impact on maternal functioning that may affect their parenting role and general well-being. Only the total raw score for the Parent Domain was used for analysis. The alpha coefficient for this study was .85 for the Parent Domain.

Mothers' social support was measured with the *Inventory of Parental Experiences* (IPE; Crnic, Greenberg, Ragozin, Robinson, & Basham, 1983). This is a maternal self-report measure of social support that has been used with families of children with disabilities (Booth, 1999; Guralnick, Neville, Connor, and Hammond, 2003). A total score was computed as the mean of 40 items in five subscales (e.g., parental role support, extended family support) based on assessments of the amount of support (e.g., "In the last week, how many times have you visited your friends?") and satisfaction with support (e.g., "How satisfied are you with this amount of visiting?"). The alpha coefficient for total support for this study was .83.

2.5. Children's peer social networks

To obtain information about the extent of children's peer social networks and the characteristics of children participating in those networks, including those children identified as friends for the laboratory sessions, a combined questionnaire and interview format was utilized. A questionnaire that included a request for information regarding her child's social contact with individual children was sent to mothers. Mothers identified their child's regular playmates (minimum contact once every two weeks) outside of school or group activities. Specifically, mothers were asked to list the children their child played with most frequently (maximum of three). In addition to playmates' names, information was obtained on the questionnaire with respect to the playmates' sex, chronological age, special needs, and relationship (e.g., neighbor, cousin).

Mothers provided additional details for each child she identified as a regular playmate of her child through an interview. Information obtained through this process included the average time playmates had known one another (assessed in annual increments) and the quality of the relationship between the two children. Mothers also provided an assessment of quality of the relationship by rating the relationship between their child and each identified playmate in terms of whether they were: (a) best friends, (b) liked each other a lot, (c) were pretty neutral about one another but still played together often, or (d) just tolerated one another. Based on mothers' responses, we obtained the following measures for each focal child: (1) at least one best friend; (2) number of best friends; and (3) an overall rating of the quality of the relationship (scale 1–4, with best friend high score). Additional general information regarding the focal child's peer social network was also obtained. Measures consisted of the following: (1) percent of children having a regular playmate, (2) number of regular playmates (maximum of three), (3) frequency of play with peers (average rating of 1 to 5 ranging from less than once per month to 4 or more times per week), and (4) time spent with playmates (average rating of 1 to 4 ranging from 1–7 h per week to > 21 h per week).

2.6. Laboratory observations of child–friend social interactions

Observations of focal children's play interactions with friends were carried out within a laboratory playroom designed to be similar to a typical play area in a classroom. Separate areas provided opportunities for housekeeping, blocks, puzzles, games, and manipulative toy play activities. To record play interactions, the room was equipped with two video cameras operated by remote control, a radio telemetry microphone for the focal child, and an overhead microphone. A control panel with mixers balanced the auditory signals and allowed use of split screen technology for video input. Thirty minute free-play sessions were scheduled on two consecutive days in the laboratory playroom to assess interactions occurring with the child's good friend selected by the mother at each time point. Video recordings were made during each of the four 30-min free play sessions for the entire time the pair was together.

The two 30-min focal child–friend observations at each time point were coded using two well-established schemes: (a) the Play Observation Scale and (b) the Individual Social Behavior Scale. Only the play interactions of the focal child were coded.

For the revised version of the Play Observation Scale (POS, Rubin, 2001) coders recorded the quality of social participation and levels of cognitive play during each 10-s interval. This scale consists of 10 mutually exclusive and exhaustive social participation categories with the cognitive play measures (e.g., dramatic play) nested within the main social participation categories of solitary (playing alone), parallel (playing next to another child), and group play (playing with other child, in this case dyadic interactive play) (see Rubin, 2001, for detailed definitions of the measures). Variations of this scale have been applied effectively to children with developmental delays similar to those in this study (e.g., Guralnick et al., 1996). Evidence with respect to convergent and discriminant validity suggests that the scale of social participation constitutes a useful index of a more general construct of peer competence (Provost & LaFreniere, 1991).

Videotapes were sent to the University of Maryland where trained staff coded all sessions. Training for POS coding was extensive and initially utilized tapes from a separate study. For pre-study reliability for the full variable matrix, including cognitive play categories nested within the social participation categories, all raters reached the minimum criterion of .70 based on an overall Cohen's κ . After training was completed, interrater reliability on approximately 20% of randomly selected focal child–friend sessions was calculated between pairs of coders and produced an overall κ of .70. In addition, intraclass correlation coefficients were calculated for the nine POS measures utilized in the analyses. This index of reliability was high for all measures, $M = .91$ (range, .73–.99). Intercoder differences were resolved through review and discussion.

Our research group reviewed each videotape a second time to examine specific peer-related social behaviors of the focal child. For this purpose, the Individual Social Behavior Scale, based on the work of White and Watts (1973) and adapted in a manner similar to Doyle, Connolly, and Rivest (1980) and to Guralnick and Groom (1985, 1987b) was used.

Observers recorded continuously the occurrence of individual social behaviors defined by 25 categories. Categories were designed to capture the social interactions of the focal child as directed to the friend (e.g., seeks attention, leads peer, expresses hostility) as well as to record the social behaviors of the focal child in response to directed activities of the friend (e.g., follows lead of peer). Through the both directed to and in response to peers application of this scale, the frequencies of both positive and negative social behaviors could be identified. Four composite scores were selected from the ISBS (positive directed to peer, negative directed to peer, responsive to peer positive, non-responsive to peer positive). Specifically, ISBS measures included in the composite measures were as follows: (1) positive directed to peer (leads peer positive-direct and indirect, uses peer as resource, joins peer, seeks peer's attention, seeks peer's agreement; $\alpha = .79$), (2) negative directed to peer (leads peer negative-direct and indirect, expresses hostility, takes unoffered object; $\alpha = .67$), (3) responsive to peer positive (follows peer's social bids to gain attention, to lead positively-direct or indirect, to use as a resource, and to seek agreement; $\alpha = .79$), and (4) non-responsive to peer positive (fails to follow peer's social bids for same categories in prior measure; $\alpha = .75$). Total positive and negative category scores also were obtained by summing over the respective composites. The total negative category included the ISBS codes of "follows" and "fails to follow peer", "direct negatives" and "indirect negatives", and "defends". In addition, nine of the 25 ISBS categories were also judged as either successful or unsuccessful, with definitions specific to each social behavior category. The ISBS coding manual with detailed definitions and coding rules can be obtained by contacting the first author.

Coders were free to review any segment of the tape as often as needed. The coding protocol was divided into 30-s intervals following the time codes superimposed on the tape. Although coding was continuous, these divisions provided a structure for the coding task and served as a framework for establishing reliability within the event-based system. Coders were considered to be in agreement if codes matched within a specified 10-s interval using the "best fit" matching method (Hollenbeck, 1978). A reliability manual describing this method is available from the first author. In addition to the 25 ISBS categories, a "no interaction" event was included to complete the possible options within each 30-s interval.

Prior to coding, four coders were trained for a period of 10–12 weeks on the ISBS. Pilot videotapes were used for training and final pretesting of reliability assessments. For pre-study reliability, calculated in this manner, all coders achieved the minimum average criterion for individual social behaviors necessary for participation of 75% (overall $\kappa = .70$) on two consecutive 30 min tapes. Mean reliabilities for focal child–friend observations carried out during the course of the study on 20% of the total were as follows: individual social behaviors, $\kappa = .75$ (range = .71–.81), M percent agreement = 80.7% (range = 74.8–98.4), and agreement on successful/unsuccessful, $M = 92\%$ (range = 81.2–98.1). Intraclass correlation coefficients were calculated for each of the core measures used in the analysis (four composites, success) to index interrater reliability and were high in all instances, $M = .96$ (range

.93–.99). To minimize observer drift, weekly coding meetings were held and interobserver disagreements were resolved by discussion and reviewing tapes.

2.7. Procedure

Mothers were scheduled to bring the children to the laboratory for time 1 observations of focal child–friend social interactions with a similar scheduling process followed for time 2, approximately two years later. Mothers were administered all interviews during the laboratory visits and received scales and questionnaires in the mail.

3. Results

As noted earlier, approximately half the children participated in an intervention to promote their peer-related social competence following time 1 observations (Guralnick et al., 2006). The primary focus of this study, however, was to examine developmental changes in children's friendship interactions for the entire sample. Consequently, all analyses reported in the present study were first carried out for condition (intervention versus control), which produced no significant effects for any of the peer interaction or peer social network measures ($p > .05$).

3.1. Comparisons between children with and without friends

To determine whether specific child and family characteristics of the group of 21 children without identified friends (NF) at both time points differed from the 42 children with identified friends (F) at both time points, we compared the two groups on all measures in Table 1 at time 1 except ethnicity. Results indicated that, in comparison to children without identified friends, children with friends had higher TACL-R total scale scores ($M_F = 71.88, SD = 14.92; M_{NF} = 61.38, SD = 15.28$), $t(61) = 2.61, p < .05$, and mothers of children with friends at both time points had more Total Support ($M_F = 2.97, SD = .36; M_{NF} = 2.68, SD = .44$), $t(61) = 2.77, p < .01$. Also, based on the peer social network measures (see Table 4), children with friends had a larger number of playmates in general ($M_F = 1.71, SD = 1.33; M_{NF} = .81, SD = .93$), $t(61) = 2.79, p < .01$.

3.2. Changes in social interactions with friends over time

Square root transformations were applied to all *ISBS* frequency measures to better approximate normality and stabilize variances for analyses. However, untransformed scores are presented in Table 2. A one-way repeated measures MANOVA was first conducted on the non-overlapping *ISBS* frequency measures for the 42 children with identified friends at both time points (successful bids, positive directed to peer, negative directed to peer, responsive to peer positive, and nonresponsive to peer positive). This produced a significant time effect, $F(5, 37) = 3.95, p < .01$.

Table 2
Changes in *ISBS* measures with friend over time and stability coefficients

ISBS measures	Time 1		Time 2		Stability coefficients	Change over time (<i>t</i> -tests)	Effect size <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Successful bids	33.69	29.57	49.40	38.38	.38*	2.82**	.61
Successful bids-proportion	.52	.13	.60	.15	.10	2.63*	.57
Positive directed to peer	52.00	46.64	68.52	52.56	.48**	2.28*	.50
Negative directed to peer	11.48	11.90	12.02	13.48	.26	<i>ns</i>	–
Responsive to peer positive	24.90	21.91	40.45	33.44	.23	2.79**	.61
Non-responsive to peer positive	18.40	18.98	21.93	20.32	.26	<i>ns</i>	–
Total positive	76.90	58.14	108.98	76.38	.39*	2.69*	.59
Total negative	45.48	35.84	48.62	34.31	.37*	<i>ns</i>	–
Positive directed to peer-proportion	.78	.17	.82	.17	.54***	<i>ns</i>	–
Responsive to peer positive-proportion	.58	.18	.66	.13	.34*	2.57*	.57
Positive behaviors-proportion	.60	.17	.68	.14	.51**	3.44**	.75

Note. $N = 42$ except for responsive to peer positive-proportion ($N = 40$). *ISBS* = Individual Social Behavior Scale.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3
Changes in POS measures with friend over time and stability coefficients

POS measures	Time 1		Time 2		Stability coefficients	Change over time, (<i>t</i> -tests)	Effect size <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Solitary play	150.02	80.71	116.50	88.07	.45***	2.75**	.60
Parallel play	76.95	42.20	87.12	42.46	.34*	<i>ns</i>	–
Group play	30.45	31.66	43.31	43.00	.38*	<i>ns</i>	–
Peer conversation	34.31	29.17	48.76	38.36	.48**	2.39*	.52
Adult interaction/conversation	6.14	6.00	5.00	5.77	.40**	<i>ns</i>	–
Transitional	21.10	9.99	15.12	7.30	.17	3.47**	.76
Onlooker	17.71	13.22	20.31	19.68	.51**	<i>ns</i>	–
Unoccupied	15.14	9.90	13.90	14.58	.34*	<i>ns</i>	–
Uncodeable	7.67	8.03	8.48	11.27	.01	<i>ns</i>	–

Note. *N* = 42. POS = Play Observation Scale.

p* < .05. *p* < .01. ****p* < .001.

Follow-up *t*-tests were then carried out for all measures and revealed a number of significant findings mainly reflecting the development of a more reciprocal relationship over time (see Table 2). Specifically, children with delays were able to achieve their ends more effectively as indicated by significant increases in the frequency and proportion of successful bids. In addition, over the two-year period, focal children became more responsive (both frequency and proportion) to the positive social bids of their friends. Moreover, positive behaviors in general increased significantly over time for all relevant measures (positive directed to peer, total positive behaviors, proportion of behaviors that were positive). In contrast, no change was detected for negative interactions as indexed by negative directed to peer and total negative behavior (*p* > .05). As noted in Table 2, social interactions with friends were consistently and moderately stable over the two-year period for most of the positive interaction measures.

A one-way repeated measures MANOVA (on square root transformed scores) carried out for all of the untransformed POS measures scores (except uncodeable) included in Table 3 produced a significant time effect, $F(8, 84) = 3.04$, $p < .05$. Follow-up *t*-tests indicated only three significant effects: solitary play and making transitions from one activity to another decreased significantly over time whereas conversations with peers increased. Of importance, no change was detected for group play ($p > .05$). In fact, the overall proportion of time in which children were engaged in group play was quite low, .08 ($SD = .09$) at time 1 and .12 ($SD = .12$) at time 2 ($p > .05$). On the more positive side, on those occasions when children were actively playing with toys or materials (a combination of solitary, parallel, and group play), the proportion of group play increased from a mean of .12 ($SD = .12$) at time 1 to .19 ($SD = .18$) at time 2, $t(41) = 2.16$, $p < .05$, $d = .45$. As noted in Table 3, stability was consistently and moderately stable for all measures except transition and uncodeable.

3.3. Subgroup analyses and focal child and family correlates

We next examined whether these changes over time were related to focal children's initial levels of interactions with their friend. For this analysis, an Overall Peer Interaction composite was first created. Specifically, a principal component analysis was applied to nine measures selected from the POS (solitary play, parallel play, group play, and peer conversation) and ISBS (the four composites plus the frequency of successful bids) codes that provide a broad representation of children's peer-related social interactions. This group of measures has been shown to be sensitive to developmental patterns and context factors in peer interactions for various groups of children (e.g., Guralnick et al., 1996). A single factor accounted for 56% of the variance at time 1 and 54% of the variance at time 2. All measures loaded positively except for solitary play. A composite measure of Overall Peer Interaction at each time point was computed by converting each component measure to a scaled score ranging from 0–100 and averaging the nine scaled measures (POS solitary play was reverse scored). The stability coefficient for the composite was $r = .32$, $p < .05$.

Two subgroups were then formed based on a median split (median = 24.37) of the Overall Peer Interaction composite at time 1. Levels of interaction differed significantly between the groups at time 1 (low subgroup, $M = 13.86$, $SD = 7.17$; high subgroup, $M = 37.95$, $SD = 9.85$, $t(40) = 9.14$, $p < .001$, $d = 2.82$). However, none of the child and family measures in Table 1 differed significantly between the subgroups at time 1 ($p > .05$). A mixed model ANOVA for the

Overall Peer Interaction composite produced a significant time effect, $F(1, 40) = 6.70, p < .01; \eta^2 = .14$, with the time \times subgroup interaction approaching significance, $F(1, 40) = 3.56, p < .07; \eta^2 = .08$. Follow-up t -tests were conducted and revealed that the low subgroup increased significantly over time (time 2, $M = 26.45, SD = 18.61$), $t(20) = 2.98, p < .01, d = .92$, but no change was detected ($p > .05$) for the high subgroup (time 2, $M = 39.96, SD = 13.83$). Despite the gains of the low interaction subgroup, they were still significantly lower than those of the high subgroup at time 2, $t(40) = 2.67, p < .01, d = .82$.

To obtain another perspective on the variability of change scores, especially since the time \times subgroup interaction in the previous analysis only approached significance, the median gain (percentage) from time 1 to time 2 for the entire sample was first calculated. Based on the Overall Peer Interaction composite, the median gain was only 19% from initial level. In fact, 40.5% of children made no gains from time 1 to time 2. For the frequency of group play measure the median gain was zero, as slightly more than half of the focal children in the sample did not increase in group interactions over time or had fewer interactions with identified friends.

Finally, we examined whether focal child and family characteristics correlated with the Overall Peer Interaction composite. Measures selected were child chronological age, sex, *FSIQ*, and behavior problems. Measures of family social status, parental stress, and parental social support were also included in the analysis. None of the concurrent correlations ($p > .05$) at either time point were significant (family social status calculated at time 1 only). In addition, none of the time 1 child or family measures predicted time 2 composite scores ($p > .05$). Accordingly, as indicated by the subgroup analysis, the best predictor of children's social interaction with their friends at time 2 was their level of social interaction at time 1 ($r = .33, p < .05$).

3.4. Characteristics of children's friends

The characteristics of the friends of the focal children whom mothers were able to identify and bring to the laboratory sessions at both time points ($N = 42$) were then examined. Friends were overwhelmingly typically developing as indicated by their not receiving any special services (time 1, 85.0%; time 2, 83.3%). Although 71.4% of the focal children with friends were boys, the majority of friends brought to laboratory sessions were girls (time 1, 53.7%; time 2, 61%). The differences between the focal child's sex and the friend's sex were significant at both time points (time 1, $z = 2.42, p < .05$; time 2, $z = 2.88, p < .01$). Only approximately 5% of friends were relatives (not living in the home) at both time periods. Friends were primarily Caucasian (time 1, 70.7%; time 2, 78%).

With respect to chronological age at time 1, friends were on average 6.8 months younger than the focal children, $t(40) = 4.42, p < .001$, and the correlation between the age of the focal child and age of the friend was significant, $r = .52, p < .01$. At time 2, focal children and friends were similar in age ($p > .05$), although the ages of the focal child and friend remained highly correlated, $r = .64, p < .001$. The family social status of the friend averaged 7 points lower than that of the focal child at time 1, $t(40) = 3.48, p < .01$, but was similar at time 2 ($p > .05$).

As noted earlier, mothers provided information with respect to their child's peer social network in which they identified those children who played most frequently with their child (maximum of 3). At time 1, only 21 of the 42 friend peers of the children brought to the laboratory were identified as one of those regular playmates but 30 of the 42 children were so identified at time 2. Of note, none of the children identified as "best friends" were brought to the laboratory play sessions, although the number of best friends identified was quite low overall (time 1: $M = .14, SD = .35$; time 2: $M = .55, SD = .70$). The length of the relationship for the group of friends who participated in the laboratory play sessions and were identified as regular playmates in the child's social network did not change over time ($p > .05$), averaging three to four years based on mothers' ratings, and only 13 focal children brought the same friend at both time periods. Despite the substantial length of many relationships, the number of contact hours with those friends remained relatively low as 85% of the children had contact only 1–7 h/month with their friend at time 1 with a similar percentage (70%) at time 2 ($p > .05$). Even for this group of friends participating in play sessions and identified as frequent playmates, the overall quality of the relationship between the children as rated by mothers was quite low, with 80% rating the relationship as being neutral or that the children just tolerated one other.

For friends brought to the play sessions at both time points, comparisons were made to determine whether the sex composition of the dyad or similarity of chronological age of the dyad was related to the focal child's level of social interactions. Analyses revealed that same sex and mixed sex dyads produced similar levels of social interaction at both time periods based on the Overall Peer Interaction composite ($p > .05$). Similar analyses comparing same age (within 6 months) and younger (more than 6 months) also failed to find differences at either time 1 or time 2 ($p > .05$).

Table 4
Measures of focal children's peer social network

Peer social network	Time 1		Time 2		Change over time	Effect size <i>d</i>
	<i>M</i> or %	<i>SD</i>	<i>M</i> or %	<i>SD</i>		
<i>Extent of regular contact</i>						
Have playmate (% yes)	61.9%		90.5%		McNemar test, $p < .001$	
Number of playmates	1.41	1.28	2.32	.98	$t(62) = 6.12^{***}$	1.90
Frequency of play with peers (rating) ¹	2.75	1.20	3.21	1.09	$t(62) = 2.83^{**}$.50
Length of time know playmates ^{2,a}	3.01	1.40	3.64	1.78	<i>ns</i>	
Time spent with playmates (rating) ^{3,a}	1.10	.30	1.72	1.27	$t(37) = 3.64^{**}$.83
<i>Friendship and quality</i>						
At least one best friend (%)	14.3%		38.7%		McNemar test, $p < .01$	
Number of best friends	.14	.35	.53	.78	$t(61) = 3.64^{**}$.65
Quality of relationships ^{4,a}	2.71	.54	2.97	.50	$t(37) = 2.06^*$.47
<i>Characteristics of playmates</i>						
Gender (% male) ^a	63.2%		77.2%		<i>ns</i>	
Age (months-average) ^a	60.37	13.70	77.43	13.60	$t(35) = 6.86^{***}$	1.62
Playmate with disability (%) (at least one) ^a	25.6%		33.9%		<i>ns</i>	
Relationship (% relatives) ^a	26.3%		28.1%		<i>ns</i>	

Note. $N = 63$. Measures with superscript "a" could be obtained only for children with identified playmates ($n = 39$, Time 1; $n = 57$, Time 2).

¹1 = less than once per month; 2 = less than once per week; 3 = 1 to 2 times per week; 4 = 2 to 3 times per week; 5 = 4 or more times per week. ²1 = < 1 year; 2 = 1 to < 2 years; 3 = 2 to < 3 years; 4 = 3 to < 4 years; 5 = 4 to < 5 years; 6 = 5 to 6 years. ³1 = 1 to 7 h per week; 2 = 8 to 14 h per week; 3 = 15 to 21 h per week; 4 = > 21 h per week. ⁴1 = just tolerate; 2 = neutral; 3 = like a lot; 4 = best friends.

* $p < .05$. ** $p < .01$. *** $p < .001$.

3.5. Changes in children's peer social networks over time

We examined changes in children's broader peer social network based on the entire sample ($N = 63$). As noted earlier, a questionnaire and interview process allowed mothers to identify a maximum of three regular playmates. As seen in Table 4, children's peer social networks as reported by mothers increased for all measures over time except for length of time their child knew the playmate. By time 2, virtually all children (90.5%) had at least one regular playmate. However, only slightly more than one-third of the mothers were able to identify at least one best friend for their child even at time 2. Overall, children had few best friends as identified by mothers. With respect to the characteristics of the playmates, most children were males, less than one-third overall had one playmate with a disability, and slightly over one-quarter were relatives. These characteristics were stable over time. At time 1, playmates were similar in age to the focal children ($p > .05$). Although the average age of playmates increased from time 1 to time 2, playmates were younger at time 2 than the focal children, $t(55) = 3.60$, $p < .01$. Finally, to examine the continuity of playmate relationships, we calculated the proportion of regular playmates identified at both time periods. Of the 91 children listed at time 1, only 27 were again listed as regular playmates at time 2.

4. Discussion

In this longitudinal study, we examined changes in the social interactions of children with mild developmental delays when interacting with friends across the early childhood and early elementary years. This is an important transition period for all children, as peer relationships and friendships begin to occupy an increasingly prominent place in children's lives, social interactions with friends become more sophisticated and complex, and the benefits of friendship become more apparent (Ladd et al., 1996; Newcomb & Bagwell, 1995; Rubin et al., 2006). A major concern, and an impetus for this investigation, was that the well-established peer-related social competence problems that are evident across this time period for children with mild developmental delays would constrain all aspects of children's social interactions, including those occurring with friends. Alternatively, the increased experience with peers over time, especially in the school situation, should provide children with considerable opportunities to establish friendships and to develop more sophisticated patterns of social interaction. In fact, the familiar patterns and structure common to

friendship relationships may well provide the circumstances best suited to countering the lack of organization and directiveness characteristic of the peer interactions of children with delays (Guralnick, 1999). In addition, the increasing cognitive and language abilities of children with delays over time, despite their slower rate of growth, should also enhance children's prospects for developing more sophisticated friendship relationships.

The results of this study suggest the existence of a complex pattern of social interactions with friends occurring over time and provide insight into the characteristics of the children identified as friends of children with developmental delays and the nature of their relationship. Detailed observational measures of children with delays when interacting with friends did reveal a number of positive features, strongly suggesting that levels of reciprocity increase over time. Specifically, when interacting with friends over the two-year period, children with delays succeeded in gaining a response to their social bids more often, became more responsive, and increased their level of positive interactions. They also conversed more with their friends, engaged in a higher proportion of dyadic interactive or group play when actually playing with toys or materials, and played alone less often. These changes over the two-year period were in the moderate range, with effect sizes extending from .50 to .75.

In contrast, children with delays were unable to integrate these positive changes in their social behavior in dyadic play into more complex social interactions over the two-year period as indicated by the absence of significant changes in the group play measure. It is important to note that the average amount of group play was quite low, far below that found for similar age or even younger typically developing children (e.g., Guralnick & Groom, 1987b), accounting for only 12% of the interactions in the play sessions even at time 2. Moreover, this proportion is not substantially different from the amount of group play these children engage in when playing with unfamiliar peers (approximately 8%) (Guralnick et al., 2006). As noted, over half the children failed to increase their involvement in group play over time.

Additional concerns with respect to social interactions with friends were evident in the subgroup analyses. A median split into initially high and low social interactors based on the Overall Peer Interaction composite revealed that children who were initially low interactors with friends did improve over time. Even so, approximately one-third of this group failed to make positive gains. In contrast, children in the initially high interaction subgroup did not change over time at all on average based on the composite measure. Furthermore, a substantial proportion (47.6%) showed declines over the two-year period. Of note, despite the gains of the low interaction subgroup, the level of social interactions at the second time point for this subgroup was still significantly below that of the initially high interaction subgroup. Initial level of interaction with friends also proved to be the only variable, including numerous child and family characteristics, that predicted changes over time.

These findings are consistent with the work of Freeman and Kasari (2002) indicating that social interactions with identified friends of children with delays do not appear to generate expected high levels of sustained interactive play. Taken together, as suggested by research on typically developing children regarding the close association between social competence and level of play with friends (e.g., Vaughn et al., 2001), our findings are most consistent with the hypothesis that general difficulties in peer-related social competence for children with delays likely serve to substantially constrain all aspects of their social interactions with friends. This pattern is also likely to contribute to later reported loneliness for these children (Margalit, 2004).

It is nevertheless surprising that social interactions between children with delays and their friends should generate such relatively small changes over time. After all, most of the friends participating in the laboratory sessions were typically developing, quite capable of organizing and scaffolding social exchanges to produce more sustained interactive play. Research has clearly demonstrated that, in comparison to dyads composed only of children with delays, children with delays paired with similar age typically developing children exhibit a far higher level of social interactions (Guralnick & Groom, 1987a).

This issue can perhaps be best understood by examining more closely the difficulties mothers had identifying friends to bring to the play sessions, the nature of the relationship between the children, and general aspects of the children's peer social networks. Specifically, fully one-third of the mothers of children with delays could not identify a friend of their child's to participate in the play sessions at both time points. Although these difficulties were related to certain child and family characteristics, such as lower child language scores and lower maternal social support, and may represent differences in motivation to participate, this finding suggests mothers face challenges in identifying friends for their children with delays. This is consistent with the peer social network results in which mothers reported that only slightly more than one-third of their children had at least one best friend even at time 2. Moreover, for those friends who did participate in the laboratory sessions, it appears that the relationship was not very strong. None brought best friends identified on the peer social network questionnaire, many who did come to the play sessions were not even identified as

regular playmates, few mothers brought the same friend at both time points, and mixed sex dyads were common. Moreover, even when mother-identified friends were described as regular playmates of the children with delays, the mothers primarily rated the quality of the relationship as one in which children just tolerated each other or were neutral towards one another. Finally, based on the peer social network measure, the average length of time children knew their playmates did not increase over the two time periods, and there was little concordance between regular playmates identified at both time periods.

These findings raise the important question as to the nature of the actual relationship that existed between these mother-identified friends and children with delays. Mothers were selected as informants to identify and bring a “good friend” because children with delays do not typically provide reliable information about their friends (Freeman & Kasari, 2002), and peer sociometric procedures were neither feasible nor appropriate. Nevertheless, we did not attempt to determine whether the child the mother identified as a friend reciprocated that friendship. In view of the previously identified difficulties evident for children with delays with regard to establishing reciprocal friendships (Guralnick et al., 1996), we chose not to define that relationship further. However, based on the inconsistent nature of friendship relationships, the lack of strength of many of the relationships, the general absence of best friends and related problems obtained in this study, it can be assumed that few of those relationships were truly reciprocal. This contrasts sharply with reports for typically developing children for whom reciprocal friends can be identified for the vast majority of children in this age range (Howes, 1990; Lindsey, 2002; Yugar & Shapiro, 2001).

It is important to note as well that, based on both the friends participating in the laboratory play sessions and the results of the peer social network measure, children with delays clearly indicate a preference for similar-age or somewhat younger typically-developing children. This pattern has been obtained in previous studies (Guralnick, 1997; Guralnick, Connor, & Hammond, 1995; Guralnick et al., 1996; Guralnick & Groom, 1988). The fact that children with delays develop social connections primarily with similar-age typically developing children is consistent with the principle of maximizing community inclusion of these children (Guralnick, 2001). At the same time, discrepancies in developmental level, along with differences associated with having a friend of a different sex at this age, can easily create a lack of common interests. These conditions are clearly not conducive to forming reciprocal friendships or generating the social interaction benefits that usually accompany such relationships (see Siperstein et al., 1997).

Clearly, designing strategies to help children with delays establish reciprocal friendships is an important goal. This will likely require a comprehensive and intensive intervention program at least initially addressing issues relevant to promoting peer-related social competence (Guralnick et al., 2006). Nevertheless, increased efforts to promote social contact with regular playmates, whether reciprocal friends or not, may well yield considerable benefits at this stage of development. Specifically, by expanding and supporting these experiences for children with delays, most often with typically developing children, more extensive and predictable social interaction sequences are likely to form. The expectation is that this will create both a foundation from which to build more complex, diverse, and competent interaction patterns and perhaps produce a shift toward more equalitarian and balanced social interactions characteristic of reciprocal friendships. That is, even in the absence of reciprocity, the social interactions that children with delays tend to establish with typically developing children in particular may well contain numerous episodes of more balanced, equalitarian forms of exchanges in which mutual influence is encouraged. As Russell, Pettit, and Mize (1998) have pointed out in relation to these more symmetrical episodes occurring in parent–child exchanges, social skills learned in this context may transfer to circumstances involving peers. A similar process may be at work for children with delays when interacting with typically developing peers. In this connection, small benefits have been found even for non-reciprocal (unilateral) friend interactions in comparison to interactions with acquaintances (Newcomb & Bagwell, 1995).

In evaluating these conclusions, careful consideration must be given to the characteristics of the sample. Although children were initially selected to participate in a larger study of children with delays experiencing peer interaction problems, such difficulties are evident for the vast majority of these young children (Guralnick, 1999). In fact, optimal circumstances for establishing friendships appear to be characteristic of the sample of children with delays and their families who participated in this study. Specifically, our sample contained primarily intact, middle-class families presumably with adequate resources to support their children’s relationships with peers. Also, children were enrolled at time 1 in inclusive early childhood settings, suggesting an interest in fostering their child’s social relationships. In addition, families with high levels of stress were excluded from the sample, as were children with substantial behavior problems. Both high parent stress and children’s behavior problems are associated with lower child peer competence (Guralnick & Groom, 1990; Guralnick et al., 2003). Even under these more optimal circumstances, our results indicated the unusual difficulties children with delays have in establishing friendships across the transition from the

early childhood to the early elementary years and in developing sustained interactive play with identified friends. Peer competence problems likely imposed constraints on all aspects of friendship relationships. Future research including a broader range of families and children will likely find even more substantial friendship difficulties than those found in this study.

We also did not examine sex differences of the focal children because of the relatively small number of girls in our sample, but expect that differences may well emerge (Rubin et al., 2006; Underwood, 2004). Finally, it is possible that mothers were unable to arrange for a good friend of their child's to come to the laboratory sessions due to scheduling or other logistical problems. However, laboratory play sessions were scheduled at the convenience of the mothers, and the majority of mothers did bring children identified on their regular playmate list of the peer social network measure.

As pointed out by Hartup and Stevens (1997), insight into the developmental significance of friendships requires an understanding of the existence of friendships, the identity and characteristics of one's friends, and the quality of those friendships. This longitudinal study of the friendships of young children with mild developmental delays addressed all of these issues and provided important information with respect to constraints imposed by children's overall peer competence. Despite the problems posed by all three aspects of friendships, important directions were outlined suggesting the potential for capitalizing on the contributions of various forms of friendship relationships.

References

- Abidin, R. R. (1995). *Parenting stress index* (3rd ed.). Odessa, FL: Psychological Assessment Resources, Inc.
- Achenbach, T. M. (1991). *Manual for the child behavior checklist/4-18 and 1991 profile*. Burlington, VT: University of Vermont, Department of Psychiatry.
- Bernheimer, L. P., & Keogh, B. K. (1988). Stability of cognitive performance of children with developmental delays. *American Journal on Mental Retardation* 92, 539–542.
- Bigras, M., LaFreniere, P. J., & Dumas, J. E. (1996). Discriminant validity of the parent and child scales of the Parenting Stress Index. *Early Education and Development* 7, 167–178.
- Booth, C. L. (1999). Beliefs about social skills among mothers of preschoolers with special needs. *Early Education and Development* 10, 455–474.
- Bukowski, W. M., Newcomb, A. F., & Hartup, W. W. (1996). Friendship and its significance in childhood and adolescence: Introduction and comment. In W. M. Bukowski, A. F. Newcomb, & W. W. Hartup (Eds.), *The company they keep: Friendship in childhood and adolescence* (pp. 1–15). New York: Cambridge.
- Buysse, V., Goldman, B. D., & Skinner, M. L. (2002). Setting effects on friendship formation among young children with and without disabilities. *Exceptional Children* 68, 503–517.
- Carrow-Woolfolk, E. (1985). *Manual for the test for auditory comprehension of language — revised*. Allen, TX: DLM Teaching Resources.
- Cmic, K. A., Greenberg, M. T., Ragozin, A. S., Robinson, N. M., & Basham, R. B. (1983). Effects of stress and social support on mothers and premature and full-term infants. *Child Development* 54, 209–217.
- Doyle, A., Connolly, J., & Rivest, L. (1980). The effect of playmate familiarity on the social interactions of young children. *Child Development* 51, 217–223.
- Freeman, S. F., & Kasari, C. (2002). Characteristics and qualities of the play dates of children with Down syndrome: Emerging or true friendships? *American Journal on Mental Retardation* 107, 16–31.
- Gardner, M. F. (1990). *Expressive one word picture vocabulary test—revised*. Novato, CA: Academic Therapy Publications.
- Geisthardt, C. L., Brotherson, M. J., & Cook, C. C. (2002). Friendships of children with disabilities in the home environment. *Education and Training in Mental Retardation and Developmental Disabilities* 37, 235–252.
- Guralnick, M. J. (1997). The peer social networks of young boys with developmental delays. *American Journal on Mental Retardation* 101, 595–612.
- Guralnick, M. J. (1999). Family and child influences on the peer-related social competence of young children with developmental delays. *Mental Retardation and Developmental Disabilities Research Reviews* 5, 21–29.
- Guralnick, M. J. (2001). A framework for change in early childhood inclusion. In M. J. Guralnick (Ed.), *Early childhood inclusion: Focus on change* (pp. 3–35). Baltimore: Brookes.
- Guralnick, M. J., Connor, R. T., & Hammond, M. (1995). Parent perspectives of peer relationships and friendships in integrated and specialized programs. *American Journal on Mental Retardation* 99, 457–476.
- Guralnick, M. J., Connor, R. T., Neville, B., & Hammond, M. A. (2006). Promoting the peer-related social development of young children with mild developmental delays: Effectiveness of a comprehensive intervention. *American Journal on Mental Retardation* 111, 336–356.
- Guralnick, M. J., Gottman, J. M., & Hammond, M. A. (1996). Effects of social setting on the friendship formation of young children differing in developmental status. *Journal of Applied Developmental Psychology* 17, 625–651.
- Guralnick, M. J., & Groom, J. M. (1985). Correlates of peer-related social competence of developmentally delayed preschool children. *American Journal of Mental Deficiency* 90, 140–150.
- Guralnick, M. J., & Groom, J. M. (1987a). Dyadic peer interactions of mildly delayed and nonhandicapped preschool children. *American Journal of Mental Deficiency* 92, 178–193.
- Guralnick, M. J., & Groom, J. M. (1987b). The peer relations of mildly delayed and nonhandicapped preschool children in mainstreamed playgroups. *Child Development* 58, 1556–1572.
- Guralnick, M. J., & Groom, J. M. (1988). Friendships of preschool children in mainstreamed playgroups. *Developmental Psychology* 24, 595–604.

- Guralnick, M. J., & Groom, J. M. (1990). The relationship between parent-rated behavior problems and peer relations in preschool children. *Early Education and Development* 1, 266–278.
- Guralnick, M. J., Hammond, M., Connor, R., & Neville, B. (2006). Stability, change, and correlates of the peer relationships of young children with mild developmental delays. *Child Development* 77, 312–324.
- Guralnick, M. J., Neville, B., Connor, R. T., & Hammond, M. A. (2003). Family factors associated with the peer social competence of young mildly delayed children. *American Journal on Mental Retardation* 108, 272–287.
- Hartup, W. W., Laursen, B., Stewart, M. I., & Eastenson, A. (1988). Conflict and the friendship relations of young children. *Child Development* 59, 1590–1600.
- Hartup, W. W., & Sancilio, M. F. (1986). Children's friendships. In E. Schopler & G.B. Mesibov (Eds.), *Current issues in autism: Social behavior in autism* (pp. 61–79). New York: Plenum.
- Hartup, W. W., & Stevens, N. (1997). Friendships and adaptation in the life course. *Psychological Bulletin* 121, 355–370.
- Hinde, R. A., Titmus, G., Easton, D., & Tamplin, A. (1985). Incidence of "friendship" and behavior toward strong associates versus nonassociates in preschoolers. *Child Development* 56, 234–245.
- Hollenbeck, A. R. (1978). Problems of reliability in observational research. In G. P. Sackett (Ed.), *Observing behavior: Data collection and analysis methods* (Vol. 2, pp. 79–98). Baltimore: University Park Press.
- Hollingshead, A. B. (1975). *Four factor index of social status*. Unpublished manuscript, Yale University, Department of Sociology, New Haven.
- Howell, A., Hauser-Cram, P., & Warfield, M.E. (2001, April). *Preschool predictors of later peer acceptance and loneliness in children with disabilities*. Paper presented at the Biennial Meeting of the Society for Research in Child Development, Minneapolis, Minnesota.
- Howes, C. (1986). The earliest friendships. In W. M. Bukowski, A. F. Newcomb, & W. W. Hartup (Eds.), *The company they keep: Friendship in childhood and adolescence* (pp. 66–86). San Diego, CA: Cambridge.
- Howes, C. (1988). Peer interaction of young children. *Monographs of the Society for Research in Child Development* 53 (1, Serial No. 217).
- Howes, C. (1990). Social status and friendship from kindergarten to third grade. *Journal of Applied Developmental Psychology* 11, 321–330.
- Keogh, B. K., Bernheimer, L. P., & Guthrie, D. (1997). Stability and change over time in cognitive level of children with delays. *American Journal on Mental Retardation* 101, 365–373.
- Ladd, G. W., Kochenderfer, B. J., & Coleman, C. C. (1996). Friendship quality as a predictor of young children's early school adjustment. *Child Development* 67, 1103–1118.
- Leffert, J. S., & Siperstein, G. N. (2002). Social cognition: A key to understanding adaptive behavior in individuals with mild mental retardation. In L. M. Glidden (Ed.), *International review of research in mental retardation* (Vol. 25, pp. 135–181). San Diego, CA: Academic Press.
- Lindsey, E. W. (2002). Preschool children's friendships and peer acceptance: Links to social competence. *Child Study Journal* 32, 145–156.
- Luftig, R. L. (1988). Assessment of the perceived school loneliness and isolation of mentally retarded and nonretarded students. *American Journal on Mental Retardation* 92, 472–475.
- Margalit, M. (2004). Loneliness and developmental disabilities: Cognitive and affective processing perspectives. In H. N. Switzky (Ed.), *International review of research in mental retardation* (Vol. 28, pp. 225–253). San Diego, CA: Elsevier.
- Nelson, K. (1981). Social cognition in a script framework. In J. H. Flavell & L. Ross (Eds.), *Social cognitive development: Frontiers and possible futures* (pp. 335–364). Hillsdale, NJ: Lawrence Erlbaum.
- NICHD Early Child Care Research Network. (2006). *A typology of friendship experience in middle childhood with antecedents in dyadic and social functioning*. Unpublished manuscript.
- Newcomb, A. F., & Bagwell, C. L. (1995). Children's friendship relations: A meta-analytic review. *Psychological Bulletin* 117, 306–347.
- Newcomb, A. F., & Bagwell, C. L. (1996). The developmental significance of children's friendship relations. In W. M. Bukowski, A. F. Newcomb, & W. W. Hartup (Eds.), *The company they keep: Friendship in childhood and adolescence* (pp. 289–321). San Diego, CA: Cambridge.
- Provost, M. A., & LaFreniere, P. J. (1991). Social participation and peer competence in preschool children: Evidence for discriminate and convergent validity. *Child Study Journal* 21, 57–72.
- Rubin, K. H. (2001). *The play observation scale*. The Center for Children, Relationships and Culture, University of Maryland, College Park: Author.
- Rubin, K. H., Bukowski, W. M., and Parker, J. G. (2006). Peer interactions, relationships, and groups. In W. Damon & Richard M. Lerner (Series Eds.) & N. Eisenberg (Vol. Ed.), *Handbook of Child Psychology: Social, emotional, and personality development* (Vol. 3, pp. 571–645). (6th ed.). New York: Wiley.
- Rubin, K. H., Coplan, R. J., Chen, X., Buskirk, A., & Wojslawowicz, J. (2005). Peer relationships in childhood. In M. Bornstein & M. Lamb (Eds.), *Developmental science: An advanced textbook* (pp. 469–512). (5th ed.). Hillsdale, N.J.: Erlbaum.
- Russell, A., Pettit, G. S., & Mize, J. (1998). Horizontal qualities in parent-child relationships: Parallels with and possible consequences for children's peer relationships. *Developmental Review* 18, 313–352.
- Siperstein, G. N., Leffert, J. S., & Wenz-Gross, M. (1997). The quality of friendships between children with and without mental retardation. *American Journal on Mental Retardation* 102, 55–70.
- Sparrow, S. S., Balla, D. A., & Cicchetti, D. V. (1984). *Vineland adaptive behavior scales*. Circle Pines, MN: American Guidance Service.
- Underwood, M. K. (2004). Gender and peer relations: Are the two gender cultures really all that different? In J. B. Kupersmidt & K.A. Dodge (Eds.), *Children's peer relations: From development to intervention* (pp. 21–36). Washington, DC: APA Publications.
- Vaughn, B. E., Azria, M. R., Krzysik, L., Caya, L. R., Bost, K. K., Newell, W., et al. (2000). Friendship and social competence in a sample of preschool children attending Head Start. *Developmental Psychology* 36, 326–338.
- Vaughn, B. E., Colvin, T. N., Azria, M. R., Caya, L., & Krzysik, L. (2001). Dyadic analyses of friendship in a sample of preschool-age children attending Head Start: Correspondence between measures and implications for social competence. *Child Development* 72, 862–878.
- Vig, S., Kammer, R. K., & Jedrysek, E. (1987). A later look at borderline and mildly retarded preschoolers. *Journal of Developmental and Behavioral Pediatrics* 8, 12–17.
- Wechsler, D. (1989). *Wechsler Preschool and primary scale of intelligence — revised*. San Antonio: The Psychological Corporation.

- Wechsler, D. (1991). *Wechsler intelligence scale for children* (3rd ed.). San Antonio: The Psychological Corporation.
- Williams, G. A., & Asher, S. R. (1992). Assessment of loneliness at school among children with mild mental retardation. *American Journal on Mental Retardation* 96, 373–385.
- White, B. L., & Watts, J. C. (1973). *Experience and environment* (Vol. 1). Englewood Cliffs, NJ: Prentice-Hall.
- Yugar, J. M., & Shapiro, E. S. (2001). Elementary children's school friendship: A comparison of peer assessment methodologies. *School Psychology Review* 30, 568–585.