Friendships of Preschool Children in Mainstreamed Playgroups

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The friendship patterns of 4-year-old mildly developmentally delayed and 3- and 4-year-old nonhand-icapped children participating in a series of mainstreamed playgroups were investigated. Results indicated that the majority of children in each of the three groups established a preference for a specific peer on the basis of a unilateral criterion, but only a small proportion of mildly delayed and 3-year-old nonhandicapped children were able to establish reciprocal friendships. The delayed group preferred nonhandicapped older children but were least preferred as friends overall by playgroup participants. For those nonhandicapped children meeting the friendship criteria, interactions with friends produced more advanced and positive social play in comparison with interactions with non-friends. However, these differences did not occur for the mildly delayed group, suggesting that delayed children may not take advantage of the potential benefits associated with friendships. Possible reasons for these problems and the need to identify relevant social processes in friendship formation are discussed.

The ability of young children to establish friendships has been investigated through direct observations of child–child so-cial interactions in a number of recent studies (Hinde, Titmus, Easton, & Tamplin, 1985; Howes, 1983; Roopnarine & Field, 1984). Various approaches to measurement and definition have led these researchers to select a range of social behaviors to in-dex friendship, including proximity, responsiveness to initia-tions, and associative or cooperative play. In addition, although the identification of a friendship pair has relied on a preferential interaction pattern based on these social behaviors, criteria have varied in terms of whether this relationship could be unilateral or must be shared by both members of the friendship pair (i.e., be reciprocal). Despite these variations, behavioral observa-tions indexing friendship do correspond to teacher ratings of friendship (Howes, 1983; Roopnarine & Field, 1984) and to maternal interviews of the play preferences of their children (Hinde et al., 1985).

The functions and ultimate significance of friendships must remain speculative at this time, but children without friends may well be at risk for later difficulties in social and emotional development (Hartup, 1983; Hartup & Sancilio, 1986). Com-parisons between young children who do and those who do not have friends indicate that children with friends are more so-cially interactive with their peers in general (Roopnarine & Field, 1984). Moreover, friendships appear to produce interac-tion patterns that differ qualitatively from peer relationships in general (Furman & Robbins, 1985). Even the behavior of young children differs substantially during interactions with friends and nonfriends. Compared with nonfriend interactions, friends

engage in a higher rate of interactions per unit of time (Hinde et al., 1985), produce and receive more positive, reinforcing, and neutral behaviors (Masters & Furman, 1981), participate in more fantasy play (Roopnarine & Field, 1984), and (for stable friendship dyads) generate the most complex social interactions (Howes, 1983).

Interest in the friendship patterns of preschool age, normally developing children has only recently been extended to young children with handicaps. Analyses of friendship patterns of handicapped children are important not only because friend-ships are likely to serve the same functions for handicapped as nonhandicapped children, but also because the deficits in peer relationships in general exhibited by young handicapped chil-dren (Guralnick, 1986a) suggest that difficulties in establishing friendships also may occur. Although the examination of friendship patterns in settings containing only other handi-capped children can be of value (Howes, 1983), the likelihood of finding social partners capable of establishing a friendship relationship may be more limited in these situations. In fact, programs containing both handicapped and nonhandicapped children, referred to as integrated or mainstreamed settings, are characterized by a potentially more stimulating and more re-sponsive social environment (Guralnick, 1978, 1986b). On the other hand, the social separation that often occurs in main-streamed settings between handicapped and nonhandicapped children may counter any potentially positive effects of this more socially interactive setting (Guralnick, 1986b).

In a recent study, Field (1984) observed the peer interactions and friendship patterns of a heterogeneous group of mildly handicapped 3-year-old children participating in joint play ac-tivities with an equal number of nonhandicapped children. De-spite the availability of nonhandicapped children, those handi-capped children who met the friendship criterion selected pri-marily other handicapped children. Nevertheless, comparisons of those children with friends and those without friends on a number of peer interaction measures indicated that the group of children with friends was much more assertive in social play

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interactions, verbalized more, and was more affectively expressive, although both groups were similar in terms of chronological age, developmental level, and type of handicap. It is important to note, however, that there are aspects of this study that limit its generalizability. Specifically, the nonhandicapped children were younger by an average of 8 months than the handicapped children; a discrepancy that may have restricted potential friendship choices despite similar developmental levels. Moreover, both the handicapped and nonhandicapped groups attended separate classes, being integrated only for play sessions. As such, familiarity and reputational factors may have affected friendship patterns.

Accordingly, the purpose of the present investigation was to examine the friendship patterns of mildly developmentally delayed and nonhandicapped preschool age children participating in a series of mainstreamed playgroups (see Guralnick & Groom, 1987). To evaluate the relationship between developmental status and chronological age on friendship selection, 4-year-old mildly developmentally delayed children participated with 4-year-old and 3-year-old nonhandicapped children. In addition, the delayed children were matched with the older nonhandicapped group in terms of chronological age and with the younger nonhandicapped group in terms of developmental level. Familiarity and reputational factors were controlled by bringing together children unacquainted with one another in an analog playgroup setting similar to that described by Coie and Kupersmidt (1983) and by Dodge (1983). The distribution of positive social interactions was selected as the behavioral index for friendships. However, separate friendship criteria involving peer preferences based on unilateral and reciprocal choice were established. On the basis of these criteria, the peer interaction patterns and demographic characteristics of children with and without friends were evaluated. In addition, for those children with friends, the qualitative and quantitative features of their social play were analyzed when participating with friends in comparison with nonfriends.

Method

Subjects

As part of a larger study (Guralnick & Groom, 1987), previously unacquainted groups of nonhandicapped and mildly developmentally delayed preschool-age boys were brought together to form a series of eight mainstreamed playgroups. Each playgroup was composed of 3 normally developing 4-year-olds (NHo), 3 normally developing 3-year-olds (NHy), and 2 mildly developmentally delayed 4-year-olds (Mi). As noted, the delayed children were selected to achieve a chronological age match with the normally developing 4-year-olds and a developmental age match with the normally developing 3-year-olds.

Table 1 presents the characteristics of each of the groups summed across the eight playgroups. Specific chronological age (CA) and intelligence test (IQ) score ranges were established as part of the inclusion criteria for each of the three groups of children. Although each of the playgroups was not identical, the established ranges as part of the inclusion criteria and the sampling procedure minimized across playgroup variability. Within each of the three groups, mean differences across playgroups averaged less than 2 months for both chronological age and mental age, and IQ varied by less than an average of 6 points. Socioeconomic status was similar ($p > .05$), although language age did differ significantly ($p < .001$) among the three groups (nonhandicapped

Table 1
Characteristics of the Sample for Each Group Across Playgroups

Measure	Group		
	Non-handicapped older ($n = 24$)	Non-handicapped younger ($n = 24$)	Mildly delayed ($n = 16$)
Chronological age	53.75	36.54	52.25
	(48–59)	(31–42)	(48–59)
Mental age	65.50	44.83	43.25
	(54–74)	(38–58)	(36–53)
Intelligence quotient[a]	110.83	106.50	71.56
	(93–124)	(93–123)	(59–86)
Socioeconomic status[b]	49.15	47.25	39.98
	(20.3–81.2)	(28.5–67.8)	(17.4–69.4)
Language age[c]	62.76	47.23	41.70
	(56.3–69.8)	(39–57)	(33.0–54.8)

Note. Range of scores is in parentheses. [a] Based on individual administrations of the Stanford-Binet Intelligence scale (Terman & Merrill, 1973). [b] Based on an occupation-based measure derived from the Seigel Prestige Scale (Hauser & Featherman, 1977). [c] Based on the Preschool Language School (Zimmerman, Steiner, & Pond, 1979).

older > nonhandicapped younger > mildly delayed). Details of the recruitment procedures, other criteria for participation, and assignments to playgroups can be found in Guralnick and Groom (1987).

Playgroup Setting and Procedures

Each playgroup operated 2 hr per day, 5 days per week for a minimum of 4 weeks (20 sessions) in either a morning or afternoon time period.[1] Playgroups were supervised by a teacher and a graduate assistant in a spacious university-based laboratory school classroom designed specifically for preschool-age children. Children participated in a wide array of group and individual activities typical of nursery school programs, including circle time, music, art, snack, and story. In addition, a 50-min free-play period was scheduled on most days. During this time children had access to the extensive array of toys and equipment found in the classroom. Separate areas provided opportunities for housekeeping, blocks, puzzles, games, and precast and manipulative toy play activities as well as an option for individual reading. Although teachers generally encouraged social and play interactions among the children in other activities, during free-play periods the staff limited their involvement to providing assistance to children when necessary.

Children's social and play interactions were videorecorded in color from an adjacent observation room through a one-way mirror. The child being recorded at the time (focal child) wore a specially designed lightweight vest equipped with a radiotelemetry microphone and a wireless transmitter (HME model WM 225A) secured in a hidden pocket in the back of the vest. In this way, both a visual and auditory record of

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[1] The number of sessions was extended if absences occurred preventing data collection for that day. No playgroup data were collected if either of the two mildly delayed children or more than one child in either of the two nonhandicapped groups were absent. In addition, specially selected pairs of children were brought together in a separate experimental playroom in which each child was matched primarily with one partner similar and one different in developmental status. Details of these pairings are not described in this report.

each child's interactions could be obtained without imposing any restrictions on the normal flow of activities.

Across the 4-week period, each child was observed for a total of 100 min during free play. Recordings commenced on the third playgroup day and were divided into segments of 10 consecutive minutes for each of 10 recording periods per child. The order of recording children in the playgroup was randomized within blocks of eight 10-min segments, and no child was observed more than once per day (usually every other day). In addition, recordings were distributed so that each child was videotaped on five occasions within the first 2 weeks (Time 1) and on five occasions during the second 2 weeks (Time 2).

As described below, videotaped recordings were analyzed using two separate scales: one focusing on individual social behaviors and the other on more global measures of social participation and cognitive play. The individual social behavior measures were used as the basis for establishing friendship choices.

Observational Measures

Individual social behaviors. To examine specific peer-related social behaviors, an individual social behavior scale was developed on the basis of 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). Specifically, observers continuously recorded the occurrence of individual social behaviors organized within 14 major categories.[2] Eleven categories were designed to record social interactions of the focal child as directed to peers. These were as follows: (a) gains the attention of a peer, (b) uses peer as a resource, (c) leads peer in activities—positive (includes neutral), (d) leads peer in activities—negative, (e) imitates a peer, (f) expresses affection to peer, (g) expresses hostility to peer, (h) competes with peer for adult's attention, (i) competes for equipment, (j) shows pride in product or attribute to peer, and (k) follows peer's activity without specific directions to do so (joining and following others). Two of the remaining categories focused on the social behaviors of the focal child in response to directed activities of a peer: (a) follows the lead of peer in response to verbal or nonverbal directions and (b) refuses to follow or ignores peer's directions or requests. The final category was one in which the focal child served as a model for a peer. In addition, the gains the attention of a peer, uses peer as a resource, and leads peer in activities—positive and neutral categories were all judged as either successful or unsuccessful. Definitions for successful or unsuccessful social interactions were specific to each social behavior category.[3] Finally, the identity of the peer interacted with also was recorded. When more than one child was involved in the interaction, the one closest in proximity to the focal child was coded.

Coders were free to review any segment of the tape as often as needed. The coding protocol for individual social behaviors was divided into 30-s intervals following time codes that were 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 (see below) within the event-based system.

Social participation and cognitive play. Each videotape was reviewed a second time to examine more global measures of social participation and cognitive play. The time code superimposed on each videotape in conjunction with a remotely controlled tape-stop device allowed observers to view tapes at 10-s intervals. Coders recorded the quality of social participation and levels of cognitive play during each 10-s interval using a slightly modified version of the scale developed by Rubin and his colleagues (Rubin, Maioni, & Hornung, 1976; Rubin, Watson, & Jambor, 1978). This scale consists of 11 mutually exclusive and exhaustive categories. The first 3 were derived from Parten's (1932) social participation categories consisting of the following play classifications: (a) solitary (playing alone), (b) parallel (playing next to another child), and (c) group (playing with another child; a combination of Parten's associative and cooperative play categories). Nested within these 3 social participation categories are 4 categories of cognitive play that are based on the work of Smilansky (1968): (a) functional (simple repetitive play), (b) constructive (learning to use materials, creating something), (c) dramatic (role taking and pretend play), and (d) games with rules (behavior in accordance with prearranged rules). If any 10-s interval was coded as either solitary, parallel, or group play, then 1 of the 4 cognitive play categories was also scored.

The eight remaining categories consisted of the following: (a) unoccupied behavior (not playing), (b) onlooker behavior (watching other children but does not enter into play), (c) reading (reading, leafing through a book, or being read to), (d) rough and tumble (mock and playful fighting, running after one another), (e) exploration (examining physical properties of objects), (f) active conversation (talking, questioning, and suggesting to other children but not playing), (g) transitional (moving from one activity to another), and (h) adult-directed (participating in any activity with an adult).

In order to obtain information with regard to whom the focal child interacted with, the identity of the peer for the group, parallel-play, rough-and-tumble, conversation, and onlooker categories was noted whenever these categories were coded. Following the procedure for the individual social behavior scale, when more than one child was involved in the interaction, the one in closest proximity to the focal child was coded. More specific definitions for the social participation and cognitive play categories can be found in Rubin's (1981) manual (see Footnote 3, this article).

Reliability. Prior to the coding of the playgroup data, three raters were trained for a period of 6 to 8 weeks on the two observation scales. Videotapes of pilot playgroups were used for training and final prestudy reliability assessments. Following the training program, all raters achieved the minimum criterion necessary for participation of 80% interobserver agreement averaged across the major categories for five consecutive 10-min segments for each of the two scales. Reliability was also obtained during the course of the study for 25% of the playgroup tapes selected on a random basis.

For the social participation and cognitive play scale, reliability was based on percentage of agreement obtained across each of the 10-s observation intervals (number of agreements divided by the total number of observations and transformed to a percentage). Cohen's (1960) Kappa was also calculated where appropriate. For prestudy reliability, raters agreed on a mean of 90% (range = 79%–100%) of the intervals (κ = .88) for the 11 categories of the social participation scale. Using only those instances in which observers agreed that a cognitive play coding was required, interobserver agreement averaged 96% (range = 86%–100%) for the four cognitive play categories. Average agreement with regard to the identity of the peer involved in the social interaction was 93% (range = 82%–100%). During the course of the study, average interobserver agreement continued to be high in all instances for each of the eight groups: for social participation, 91% (range = 88%–95%), κ = .89 (range = .86–.93); for cognitive play, 97% (range = 89%–100%); and for the identity of the peer, 98% (range = 95%–99%).

For the individual social behavior scale, raters were considered to be in agreement if codes matched exactly within a specified 30-s interval. All 30 individual social behavior categories were included in addition

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[2] A number of the 14 individual social behavior categories contained subcategories that were coded separately, bringing the total number of categories actually coded to 30. With minor exceptions, however, these subcategories were not relevant to the purposes of this study and were therefore omitted.

[3] Coding rules and the coding manual for the individual social behavior scale as well as modifications of the social participation and cognitive play scale (see below) can be obtained by writing to Michael J. Guralnick.

to a "no-interaction" event that completed the possible options within each interval.[4] Percentage of agreement was obtained for each 10-min segment by taking the total number of agreements, dividing by the total number of observed individual social interactions, and transforming to a percentage. One unit was added if both observers agreed that no interaction had occurred during an entire 30-s interval. Calculated in this manner, the average prestudy agreement for this scale was 86% (range = 77%–100%), κ = .85. Given agreement on the occurrence of a particular social interaction, observers further agreed on an average of 84% (range = 69%–100%) of the occasions as to whether the event could be classified as successful or unsuccessful and on an average of 96% (range = 87%–100%) as to the identity of the peer involved in the social interaction. Mean reliabilities for observations carried out during the course of the study (25% of the total) were as follows: for individual social behaviors, 90% (range = 84%–93%), κ = .87 (range = .81–.90); for successful/unsuccessful, 95% (range = 90%–99%); and for identity of peer, 99% (range = 98%–99%).

Results

Frequencies of those eight individual social behavior categories that consisted of positive peer-related interactions provided the basis for identifying friendship pairs. These categories were as follows: (a) gains the attention of a peer, (b) uses peer as a resource, (c) leads peer in activities—positive and neutral, (d) imitates a peer, (e) expresses affection to peer, (f) shows pride in product or attribute to peer, (g) follows peer's activity without specific directions to do so (joining and following others), and (h) follows the lead of peer in response to verbal or nonverbal directions. Overall, approximately 75% of child–child social interactions were positive.

As noted above, two separate friendship measures were established on the basis of preference patterns for individual children. For the unilateral friendship measure, the preferences for each (focal) child were established by developing a matrix consisting of the total frequency of interactions for the eight categories as directed to each of the child's potential companions within a playgroup. This was done separately for each of the two time periods. The proportion of total interactions for each child directed to each of the seven possible companions was then calculated. To be considered a "friend" a focal child must have directed at least 33% of his interactions to a specific companion. Therefore, more than one friend could be identified by this procedure. For the reciprocal friendship measure, the matrix of interactions was used to identify those children who not only met the 33% criterion in that time period for a particular child in their playgroup (unilateral criterion) but were also selected by that child as a friend (also meeting the 33% criterion). More than one reciprocal friendship pair could also be identified using this procedure. A minimum of 10 interactions was required in each time period to be included in the analysis. Each of these two friendship measures was calculated separately for all children in the NHo, NHy, and Mi groups. As noted, separate assessments were obtained for the first 2 weeks (Time 1) and the final 2 weeks (Time 2) of the playgroups.

The possibility exists that the proportion positive interactions index used in this study has special properties that do not correspond to other indexes, especially durational measures (see Hinde et al., 1985). To examine this issue, an approximation to a durational criterion was derived by selecting all of the obser

vational intervals consisting of parallel and group play (each interval was 10 s in duration). A matrix was then created that was identical to that established for the proportion positive interactions index, and preferences for individual children were identified using both the unilateral and reciprocal criteria. Following this procedure, it was found that the percentage of friendship selections that would have resulted using the durational approximation index was highly similar to that using the proportion of positive interactions index. Specifically, averaging across time, the correspondence for NHo, NHy, and Mi was 71%, 67%, and 67%, respectively, for the unilateral criterion. The correspondence was even greater for the reciprocal criterion. Averaging across time periods, identical friendship choices would have resulted for 91% for NHo and for 77% for NHy.[5]

For each friendship measure, the following series of analyses were carried out. First, the proportion of children in each group (NHo, NHy, Mi) who met the friendship criteria were compared, as were changes in this proportion across the two time periods. In addition, the extent to which children in each of the three groups selected children from their own or other chronological age/developmental status groups was evaluated. The second series of analyses examined the demographic characteristics and peer interaction patterns of children who did have at least one friend in comparison to those who failed to meet the friendship criteria. This was carried out separately for each group and time-period combination in which a sufficient number of subjects with and without friends were available. Finally, for those children meeting the friendship criteria, the qualitative and quantitative aspects of their social play were examined when interacting with friends in comparison to those occasions in which they interacted with nonfriends. In those instances in which multivariate analyses of variance (MANOVA) were applied, Wilks's criterion was used (SAS Institute, 1982). Whenever frequency data were transformed to proportions in these analyses, the arc sine transformation was used. However, to facilitate interpretation of the results, data presented in the tables and text are untransformed scores.

Unilateral Friendships

Friendship Preferences

The proportion of subjects in each group for each time period meeting the unilateral friendship criterion is presented in the upper portion of Table 2. The denominators for the proportions differ from the total number of subjects for each group because some subjects did not have the required 10 positive individual social interactions. The second set of parentheses contains the number of children with two peer preferences. As can be seen, the majority of children in each of the groups met the criterion for unilateral friendships. The proportions test (two-tailed) was used to determine if any of the three groups (NHo, NHy, Mi)

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[4] As noted, all 30 categories were used for the calculation of reliability. Accordingly, the level of interobserver agreement that was obtained should be considered a conservative estimate. In addition, reliability for the 8 individual social behavior categories selected to index friends (see Results) were representative of the more general dataset.

[5] Only two mildly delayed children established reciprocal friendships.

Table 2

Proportion of Subjects Meeting the Unilateral Friendship Criterion for Each Group and Time and the Distribution of Friendship Choices Across Peer Groups

	Group		
	Non-handicapped older (NHo)	Non-handicapped younger (NHy)	Mildly delayed (Mi)
Proportion meeting criterion			
Time 1	.913	.810	.692
	(21/23) (2)	(17/21) (2)	(9/13) (0)
Time 2	.833	.667	.600
	(20/24) (5)	(16/24) (2)	(9/15) (2)
Friendship choices peer group			
NHo	34 (71%)	21 (57%)	13 (65%)
NHy	8 (17%)	14 (38%)	5 (25%)
Mi	6 (12%)	2 (5%)	2 (10%)

Note. The first set of parentheses contains the basis for the proportion. Some children did not meet the 10 interaction minimum ($n = 24$ for NHo and NHy; $n = 16$ for Mi). The second set of parentheses contains the number of children with two peer preferences. Friendship choice data are summed over the two time periods. Percentages in parentheses are distributions within each peer group.

differed from each other within each of the time periods. No significant differences were obtained ($p > .05$). We used two different tests to examine whether each of the three groups' friendship patterns changed over time. First, approximate confidence intervals for the proportions were established. Because each of the three distributions overlapped considerably, it was tentatively concluded that no changes in the proportion of unilateral friendships occurred across time. This was supported by the McNemar test for the significance of changes (Siegel, 1956), which evaluated the extent to which the status of individual children changed in relation to the friendship criterion from Time 1 to Time 2. None of the chi-squares approached significance ($p > .05$).

To determine how children distributed their friendship selections across the three peer groups (the term *peer group* refers to children who were the targets of an interaction), the frequency of choices was summed across the two time periods for each of the three groups. For children in the NHo group, a total of 48 friendship pairs were obtained (including the 7 children with more than 1 friend). Of those 48 friendship pairs, NHo children selected other NHo children on 34 occasions (71%), NHy children on 8 occasions (17%), and Mi children on 6 occasions (12%). This apparent preference for selecting other NHo children as friends was evaluated in the following manner: A theoretical proportion of expected friendship pairings for each of the three groups based strictly on the availability of children in each peer group was determined. These proportions for the NHo group were .29, .43, and .29 for the NHo, NHy, and Mi peer groups, respectively. Expected proportions for the NHy and Mi groups were calculated similarly. The test of proportions (two-tailed) between observed and expected proportions for the NHo group revealed a significant effect for all three peer groups:

for NHo ($z = 6.49$, $p < .001$); for NHy ($z = -3.69$, $p < .001$); and for Mi ($z = -2.48$, $p < .02$).

Nonhandicapped younger children had a total of 37 friendship selections. Of that total, 21 children represented the NHo peer group (57%), 14 the NHy peer group (38%), and only 2 children from the Mi peer group were selected (5%). Tests of proportions between observed and expected values for the NHy group indicated a significant effect only when the peer group consisted of Mi children ($z = -3.14$, $p < .01$). As indicated, the Mi children were selected significantly less often by children in the NHy group than expected on the basis of their availability in the playgroup.

Finally, for the Mi group, 20 friendship choices were made and a strong preference for the NHo peer group was obtained (65%, 13 choices). The NHy children were selected 25% of the time, but only 2 Mi children (10%) were chosen by other children in the Mi group. The test of proportions confirmed the unusual preference for the NHo peer group ($z = 1.99$, $p < .05$) by children in the mildly delayed group.

Comparisons Between Children With and Without Friends

To determine whether children who had at least one friend on the basis of the unilateral criterion differed from those without friends on a variety of demographic and peer interaction variables, the following procedure was followed. First, Table 2 was examined to select those groups and time periods that contained a sufficient number of friend and without-friend classifications to allow a meaningful between-group analysis ($N > 4$). Second, the demographic factors of chronological age, mental age, IQ, SES, and language age were analyzed. If any of these factors differed significantly between the friend and without-friend groups, they were used as covariates for subsequent analyses of the peer-interaction variables.

Scores on the various peer interaction measures were used to compare children with friends and without friends for each appropriate group and time combination. It is important to note that the initial classification of children into the with and without-friends groups was based strictly on a preference measure (using positive interactions). Once this categorization was made, interest focused on comparing the qualitative and quantitative features of the social and play interactions, irrespective of play partner, of these two independent groups.

Specifically, for the social participation scale, the frequency of occurrence of each of the 11 categories was analyzed as well as the percentage of intervals in which children engaged in functional, constructive, and dramatic play. For the individual social behavior measures, the 14 major categories were reorganized into a negative interaction category (consisting of negative leads, competes for equipment, refuses to follow, and hostility) and a positive interaction category (all others). Both the frequency and proportion of positive and negative interactions were analyzed as was the proportion of instances in which children succeeded in gaining an appropriate response to their social bids. Finally, the six most frequently coded peer-directed individual social behaviors were selected to determine if the proportional distribution of these interactions was similar for those with and without friends. More specifically, using the total

number of individual social behaviors for the respective time period for each child as the base, the proportions of interactions coded for the following categories were analyzed: gains attention, uses as resource, leads-positive, leads-negative, follows activity, and competes for equipment. The remaining categories did not occur with sufficient frequency to allow a meaningful interpretation of the results.

Because a substantial proportion of children in each group and time period met the unilateral friendship criterion, only the NHy and Mi groups during Time 2 qualified for analysis (see Table 2). For the NHy group, separate analyses of variance (ANOVAs) carried out for the with and without-friend groups on each of the demographic factors revealed a significant effect only for SES, $F(1, 21) = 5.91$, $p < .05$. Subjects with friends had a higher SES score ($M = 50.64$) than those failing to meet the friendship criterion ($M = 40.90$). Separate multivariate analyses of covariance (MANCOVAs), with SES as the covariate, were then carried out for the 11 social participation measures, the 3 cognitive play measures, and the 6 proportional distribution measures for the individual social behavior scale. A significant multivariate effect was obtained only for the social participation measures, $F(10, 11) = 3.58$, $p < .05$. Significant univariate effects were found for the group play, $F(1, 20) = 8.33$, $p < .01$, and adult-involved, $F(1, 20) = 5.34$, $p < .05$, categories. Children with friends engaged in more group play ($M = 26.88$) than those without friends ($M = 11.75$) but were involved with adults less frequently (M with friends $= 4.13$; M without friends $= 10.00$). Separate ANCOVAs were also carried out on the frequency and proportion measures for positive interactions as well as the proportion success measure. Significant effects were obtained only for negative interactions, $F(1, 20) = 5.17$, $p < .05$, indicating a higher rate for children who did not have friends, and for the proportion of positive interactions, $F(1, 20) = 4.37$, $p < .05$, indicating a higher proportion for those who did have friends. An identical set of analyses for the mildly delayed children for Time 2 did not reveal differences for any of the measures ($p > .05$).

Children With Friends: Comparisons Between Interactions With Friends and Nonfriends

To determine whether children with unilateral friendships interact differently with friends in comparison to those not selected as friends, a series of within-subject analyses were carried out for each group and time period combination. Separate analyses were conducted for each time period because most, but not all, of the same subjects met the unilateral friendship criterion in both Time 1 and Time 2. For the social participation scale, the four social play categories in which a companion could be identified were parallel play, group play, conversation, and rough-and-tumble play. The total number of interactions coded for these four categories were summed separately for friends and nonfriends. This procedure yielded the base figures for calculating the proportions of instances in which children engaged in each of the four types of social play. Separate within-subject ANOVAs were then carried out on these proportion measures for each category. Similar analyses were carried out for the six most frequently coded peer-directed individual social behavior cate-

gories (MANOVA) using the proportional distribution measure described above. The proportions of positive and negative interactions and the proportion success measure were also analyzed.

Nonhandicapped older group. For the NHo group in Time 1, children engaged in a greater proportion of group play when with friends ($M = .30$) than with nonfriends ($M = .13$), $F(1, 40) = 7.43$, $p < .01$. That is, when children were interacting socially with friends, about one-third of that time consisted of group play. None of the other categories reached significance ($p > .05$). Analyses of the six individual social behavior categories also indicated that children interacted differently when with friends than with nonfriends, because a significant multivariate effect was obtained, $F(6, 35) = 6.31$, $p < .001$. Separate univariate analyses revealed that greater proportions of gains attention, $F(1, 40) = 15.05$, $p < .001$, uses as resource, $F(1, 40) = 6.13$, $p < .05$, and positive leads, $F(1, 40) = 6.75$, $p < .05$, occurred when children were interacting with friends than with nonfriends. In contrast, children competed for equipment with nonfriends proportionally more often than with friends, $F(1, 40) = 12.01$, $p < .01$. Finally, the proportion of positive interactions was greater (and, therefore, the proportion of negative interactions was smaller) when children interacted with friends than with nonfriends, $F(1, 40) = 5.36$, $p < .05$. Children's social bids were successful about half the time, irrespective of the friendship status of their partner.

For Time 2, separate ANOVAs carried out on the proportion of instances in which NHo children engaged in the four categories of social play indicated a significant effect only for parallel play, $F(1, 37) = 4.13$, $p < .05$. Children were involved in parallel play to a lesser extent with friends ($M = .47$) than with nonfriends ($M = .61$). However, a significant multivariate effect for the six individual social behavior categories, $F(6, 33) = 3.37$, $p < .05$, indicated an interaction pattern for the NHo children in Time 2 similar to that in Time 1. Specifically, univariate analyses revealed that children engaged in a greater proportion of interactions seeking to gain the attention of others, $F(1, 38) = 9.56$, $p < .01$, and to use others as resources, $F(1, 38) = 5.52$, $p < .05$, when with friends than nonfriends. In contrast, greater proportions of negative leads, $F(1, 38) = 6.02$, $p < .02$, and competing for equipment, $F(1, 38) = 8.66$, $p < .01$, were observed when their partners were nonfriends in comparison with friends. Finally, a greater proportion of positive interactions (and, therefore, a smaller proportion of negative interactions) were directed to friends than nonfriends, $F(1, 38) = 9.40$, $p < .01$. The proportion of success measure was not significant ($p > .05$).

Nonhandicapped younger group. In contrast to the NHo group, none of the measures for the NHy children in Time 1 were significant ($p > .05$). This pattern was present in Time 2 for the measures based on the individual social behavior scale ($p > .05$). However, the friendship status of the partner did matter for the group-play measure, because a higher proportion of group play was observed when children interacted with friends ($M = .34$) as opposed to nonfriends ($M = .09$), $F(1, 30) = 13.29$, $p < .001$.

Mildly delayed group. Overall, mildly delayed children interacted with friends and nonfriends in a similar manner. The only significant effect obtained for any measure was for the proportion of positive (and negative) interactions during Time 1, $F(1,$

16) = 4.49, $p < .05$. In this case interactions with friends were more positive ($M = .82$ vs. $M = .66$) and less negative than interactions with nonfriends.

Reciprocal Friendships

The second major series of analyses focused on the more stringent criterion for establishing a friendship, that is reciprocity. As noted earlier, to be considered a friendship pair, a child was not only required to prefer a particular child (using the .33 positive interaction criterion) but that preference must have been reciprocated (again using the .33 criterion). Having established friendship pairs on the basis of this criterion, the same series of analyses described in the section on unilateral friendships were carried out.

Friendship Preferences

As indicated in Table 3, a smaller proportion of children met the criterion for a reciprocal than for a unilateral friendship (see Table 2). Analyses for each comparison between unilateral and reciprocal friendships (McNemar test) revealed significant effects for NHo, $\chi^2 (1, N = 23) = 8.10$, $p < .01$, for NHy, $\chi^2 (1, N = 21) = 11.08$, $p < .001$, and for Mi, $\chi^2 (1, N = 13) = 6.13$, $p < .05$, in Time 1, and for NHo, $\chi^2 (1, N = 24) = 6.13$, $p < .05$, for NHy, $\chi^2 (1, N = 24) = 9.09$, $p < .01$, and for Mi, $\chi^2 (1, N = 15) = 6.13$, $p < .05$, in Time 2. The proportions test (two-tailed) was also used to determine if any of the three groups (NHo, NHy, Mi) differed from one another for each time period with regard to meeting the reciprocity criterion. Significant effects were obtained for comparisons involving NHo and NHy in both Time 1 ($z = 2.01$, $p < .05$) and Time 2 ($z = 2.12$, $p < .05$), and for NHo and Mi in both Time 1 ($z = 2.45$, $p < .05$) and Time 2 ($z = 2.67$, $p < .05$). Calculation of confidence intervals within groups across time revealed widely overlapping distributions, suggesting that the proportion of children in each group with reciprocal friendships remained the same from Time 1 to Time 2. This was confirmed by the McNemar test, which evaluated the extent to which the status of individual children changed in relation to the friendship criterion over time ($p > .05$).

Table 3 also presents the distribution of the friendship choices for children in each group in relation to their companion's peer group membership. Following the procedure described for unilateral friendships, an expected proportion of reciprocal friendship choice was calculated and a series of proportions tests was used to compare the expected and obtained proportions for friendship preferences. As can be seen, for NHo children, the peer group membership of the reciprocal friend was almost always another NHo (87%). Significant effects were obtained for the NHo ($z = 6.21$, $p < .001$), NHy ($z = -3.32$, $p < .01$), and Mi ($z = -2.59$, $p < .01$) peer groups. For the NHy group, reciprocal friendships were established primarily with children from their own peer group (67%). This stands in contrast to the unilateral friendship measure in which NHo and NHy children were preferred to approximately the same extent. Tests of expected and observed proportions confirmed this preference for other NHy children ($z = 2.52$, $p < .02$). Finally, only two Mi children met the reciprocal friendship criterion. This

Table 3
Proportion of Subjects Meeting the Reciprocal Friendship Criterion for Each Group and the Distribution of Friendship Choices Across Peer Groups

	Group		
	Non-handicapped older (NHo)	Non-handicapped younger (NHy)	Mildly delayed (Mi)
Proportion meeting criterion			
Time 1	.478	.190	.077
	(11/23)	(4/21)	(1/13)
Time 2	.500	.208	.067
	(12/24)	(5/24)	(1/15)
Friendship choices peer group			
NHo	20 (87%)	2 (22%)	1 (50%)
NHy	2 (9%)	6 (67%)	1 (50%)
Mi	1 (4%)	1 (11%)	0 (0%)

Note. The parentheses contain the basis for the proporton. Some children did not meet the 10 interaction minimum ($n = 24$ for NHo and NHy; $n = 16$ for Mi). Friendship choice data are summed over the two time periods. Percentages in parentheses are distributions within each peer group.

too contrasts sharply with the unilateral friendship measure in which 20 friendships were identified, primarily involving children in the NHo and NHy peer groups. Clearly, for mildly delayed children, friendships were rarely reciprocated.

Comparisons Between Children With and Without Friends

To determine whether children meeting the reciprocal friendship criterion differed from those who did not, the procedure described in the analogous section for children with unilateral preferences was followed. Sufficient numbers of subjects (see Table 3) were available for an analysis of NHo at both Time 1 and Time 2 and for NHy at Time 2. The series of analyses carried out on the demographic factors, the social participation and cognitive play measures, and the individual social behavior scale revealed few differences between children with and without friends. For the demographic factors, NHo children with friends at Time 1 had a significantly higher SES score ($M = 55.90$) than did children without friends ($M = 42.10$), $F(1, 21) = 5.90$, $p < .05$. No other factors were significant. For the peer interaction measures, the only significant effects were those involving the total number of positive individual social behaviors. Specifically, the NHo children with friends at both Time 1, $F(1, 20) = 8.53$, $p < .01$, and Time 2, $F(1, 22) = 11.38$, $p < .01$, had a greater frequency of positive interactions than NHo children without friends. In addition, despite the absence of a significant multivariate effect (MANCOVA), we observed a strong tendency for the children with friends in Time 1 to engage in a greater frequency of group play than those without friends (univariate), $F(1, 20) = 10.87$, $p < .01$. No significant effects were obtained for the NHy group in Time 2.

Children With Friends: Comparisons Between Interactions With Friends and Nonfriends

To determine if children with friends interact differently with friends in comparison to nonfriends, a series of within-subject analyses were conducted identical with those described in the analogous section for unilateral friendships. As indicated in Table 3, a sufficient number of subjects were available for analysis for NHo children in Time 1 ($n = 11$) and Time 2 ($n = 12$) and for NHy children in Time 2 ($n = 5$). We obtained assessments of the four social play measures from the social participation scale and the six individual social behavior measures as well as the positive, negative, and successful interaction outcomes. All measures were proportions.

Nonhandicapped older group. During Time 1, NHo children engaged in a significantly higher proportion of group play with friends ($M = .43$) than with nonfriends ($M = .17$) when playing with others, $F(1, 20) = 8.99, p < .01$. In addition, in comparison to interactions with nonfriends, social interactions with friends were observed to contain a greater proportion of efforts to gain attention, $F(1, 20) = 12.15, p < .01$, and to use friends as resources, $F(1, 20) = 6.43, p < .05$. There was also a tendency to be more successful in achieving a response to those social bids directed toward friends, $F(1, 19) = 4.30, p < .052$. However, when interacting with nonfriends, a greater proportion of the interactions involved competing for equipment, $F(1, 20) = 10.19, p < .01$, and interactions were more negative, $F(1, 20) = 6.92, p < .05$.

In Time 2, these differences were less marked, because significant effects were obtained only for the conversation variable, $F(1, 22) = 4.72, p < .05$, and for use others as resources, $F(1, 22) = 5.32, p < .05$. In both instances, a higher proportion was obtained for the NHo children when interacting with friends as opposed to nonfriends.

Nonhandicapped younger children. Children with friends in the NHy group in Time 2 interacted differently with friends and with nonfriends only for the group play measure. Specifically, when playing with friends the proportion of group play ($M = .39$) was significantly greater than when playing with nonfriends ($M = .12$), $F(1, 8) = 14.01, p < .01$.

Discussion

Using a criterion for friendship that is based on the proportion of positive social interactions directed to an individual child but not necessarily reciprocated, most 3- and 4-year-old nonhandicapped children and 4-year-old mildly developmentally delayed children demonstrate preferences for specific peers soon after entering a mainstreamed playgroup setting. Preferences were observed during both time periods of the playgroup and were similar in extent to those obtained by Hinde et al. (1985) and Roopnarine and Field (1984). However, when the criterion for defining a friendship was made more stringent by adding a requirement for reciprocal choice, a developmental difference emerged. Specifically, about half of the nonhandicapped 4-year-olds continued to meet the friendship criterion. However, this was the case only for a relatively few nonhandicapped 3-year-olds or mildly delayed children. Accordingly, these results have implications for those investigators selecting

an observational criterion to identify friendships, because the more stringent criterion was uniquely sensitive to potentially important differences associated with a child's chronological age and developmental status. As Hayes, Gershman, and Bolin (1980) noted, reciprocal friendships appear to be based on socially significant factors, such as participation in common activities and positive evaluation, and may even prove to be highly stable. Unilateral preferences, in contrast, appear to be based on factors related to toy possession and proximity. The differences found in this study with regard to the ability of children at different developmental levels to form friendships as defined by these two criteria may reflect the different cognitive and social demands required by these two aspects of friendship.

For nonhandicapped older children, although opportunities for both same-age and cross-age selections of friends were available in the playgroup, friendship pairs tended to segregate on the basis of chronological age (see Goldman, 1981). This held for both the unilateral and reciprocal criteria. However, a different pattern emerged for the 3-year-old nonhandicapped children. Specifically, the data suggest that the 3-year-olds had a strong interest in interacting with the 4-year-old nonhandicapped children, as indicated by the pattern using the unilateral criterion. Despite this interest, the 4-year-olds did not reciprocate frequently, choosing other nonhandicapped 4-year-olds and leaving those 3-year-olds who were able to establish reciprocal relationships to select primarily other age-mates as friends. Mildly delayed children also demonstrated a preference for their chronological age-mates (NHo) rather than children younger but matched in terms of developmental level (NHy). However, these preferences, which were based on the unilateral criterion, were reciprocated in only two instances. Even for unilateral friendships, both NHo and NHy children revealed a clear lack of preference for the mildly delayed children. As a consequence, on the basis of these friendship criteria, mildly delayed children must be considered as socially separate from the other children in the setting.

As Hinde et al. (1985) point out, no generally acceptable observational criteria exist for identifying friendships. The behavioral index used in this study, which was based on the proportion of positive interactions, was, however, similar to a variety of other approaches that have received preliminary validation through ratings by teachers and peers or through maternal interviews (Hinde et al., 1985; Howes, 1983; Roopnarine & Field, 1984). The correspondence to the durational index also increases confidence in the validity of this preference measure. Furthermore, as discussed below, the differences found in peer interactions particularly in the friend versus nonfriend comparisons offer additional support for the appropriateness of this measure.

When nonhandicapped 3- and 4-year-old children who met either the unilateral or reciprocal friendship criterion were compared with those who did not, only minor differences on demographic factors emerged. This finding held for the mildly delayed children as well, a result consistent with previous work (Field, 1984). It would certainly be reasonable to expect that those children within a group who were able to establish friendships would have more advanced language or cognitive skills. It is possible, however, that a threshold level may be necessary for these factors and, once reached, other processes related to

friendship formation become paramount (see Gottman, 1983). Moreover, although the tendency for children with friends to engage in more group play, to be less involved with adults, and to be more positive and less negative than those without friends existed for both the unilateral and reciprocal criteria, neither marked nor consistent differences were apparent. This analysis was limited, however, by the fact that only two of six comparisons could be evaluated for the unilateral criterion because relatively few children did not have friends.

The absence of differences on the peer interaction measures between those children with and without friends may have also been due to the fact that the peer interaction measures for the group of children with friends included a significant proportion of interactions with nonfriends. This circumstance may have tended to obscure any differences that may have actually existed. In fact, focusing only on those children who established friendships, comparisons of children interacting with friends in contrast to nonfriend interactions supported this possibility. Overall, for both 3- and 4-year-old nonhandicapped children, interactions with friends produced more group play, a form of social participation requiring extensive adaptive and interactional skills (Guralnick, 1986a). Four-year-olds were also observed to exhibit a greater proportion of positive interactions and proportionally more attempts to engage peers in social exchanges when with friends. Moreover, interactions with friends were characterized by proportionally fewer negative exchanges or competitions over equipment.

These patterns are consistent with those obtained by other investigators (Hinde et al., 1985; Masters & Furman, 1981) and suggest the value of friendships in facilitating important aspects of peer relations. In contrast to nonhandicapped children, however, mildly delayed children interacted similarly with friends and nonfriends. Friends did interact more positively, and some trends toward more group play were noted, but reliable and consistent patterns that differentiated between these two types of play partners were not found. Although their overall level of group play was lower than the nonhandicapped children (see Guralnick & Groom, 1987), sufficient involvement in group play and an adequate number of individual social behaviors were observed to permit any differences to emerge in friend–nonfriend comparisons. Accordingly, the possibility must be considered that mildly delayed children may not benefit from some of the possible "developmental advantages" of friendships (Hartup & Sancilio, 1986) as do nonhandicapped children, even compared with those nonhandicapped children who are matched in terms of developmental level.

It is interesting to note that the mildly delayed group of children displayed a series of surface friendship behaviors that were very similar to normally developing children, especially to those children who were matched in terms of developmental level. For example, similar proportions of unilateral friendships were obtained for both mildly delayed and nonhandicapped younger children. However, differences emerge as these relationships are probed further. As noted, mildly delayed children rarely exhibited reciprocal friendships and tended to be isolated in the mainstreamed playgroup. Moreover, even when mildly delayed children did interact with their friends, the ability to sustain interactions in order to establish group play, a process requiring considerable interactive skill, was nevertheless unaffected.

The reasons for these problems are open to speculation. Mildly delayed children do exhibit generalized deficits in peer relationships (Guralnick & Groom, 1985, 1987; Guralnick & Weinhouse, 1984). However, even with improvements in their peer relations and the availability of potentially more responsive peers found in mainstreamed settings, it is likely that mildly delayed children will continue to experience difficulties in establishing friendships (Furman & Robbins, 1985). In fact, the social processes associated with the development of friendships in young children have only recently been the focus of attention (Gottman, 1983). Given the potential developmental significance of establishing special relationships with one's peers, it is essential that future studies seek to identify and analyze those social processes of developmentally delayed children that may not be sufficiently developed to permit friendships to be established. Once these processes are more fully understood, it may be possible to design effective strategies to foster friendship relationships.

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