

Immediate Effects of Mainstreamed Settings on the Social Interactions and Social Integration of Preschool Children

Michael J. Guralnick, Robert T. Connor, Mary Hammond,
John M. Gottman, and Kelly Kinnish

University of Washington

The immediate effects of mainstreamed and specialized settings on the peer interactions of preschool children with and without developmental delays were examined. Mainstreamed and specialized playgroups were established involving unacquainted peers and using a methodology that ensured appropriate matching of child and family characteristics. For each 2-week playgroup, the social and play interactions of each child were observed during a designated free-play period. Peer sociometric ratings also were obtained. Results indicated higher levels of peer interactions in mainstreamed settings for both typically developing children and children with developmental delays. The immediate impact of mainstreamed settings appeared to be attributed to the social demands and higher interaction levels of the former group. Children with developmental delays were not fully accepted nor totally socially integrated based on sociometric measures and behavioral indices of peer preferences. Implications of these findings for developing intervention programs to maximize children's peer-related social competence was discussed.

The impact of integrated and specialized settings on the peer interactions of young children with and without developmental delays is an important issue that has received considerable attention from investigators (Beckman & Kohl, 1984, 1987; Field, Roseman, DeStefano, & Koewler, 1981; Guralnick, 1981; Guralnick & Groom, 1988; Jenkins, Odom, & Speltz, 1989; Jenkins, Speltz, & Odom, 1985; Miller et al., in press). Findings have consistently revealed relatively modest benefits in peer interactions for children with developmental delays when participating with typically

developing children. Although investigators have not always observed advantages, only minor instances of adverse effects for children with disabilities have been reported. Moreover, the social interaction patterns of typically developing children appear to be unaffected by the presence of children with disabilities (see Buysse & Bailey, 1993, for a review).

Please note that we reserve the term *inclusion* to represent the full integration of individuals with disabilities in all aspects of home, school, and community life. The term *mainstreaming* is intended to repre-

sent full inclusion in school, including preschool programs, that is, when children with disabilities are enrolled in programs primarily containing typically developing children. *Integration* is a more generic term applied to the school situation and may include departures from mainstreaming, such as when more limited contact during part of the day between children with and without disabilities is planned.

Although the outcomes of comparisons between integrated and specialized settings have been generally consistent, the actual mechanisms through which the peer interactions of children with developmental delays are influenced in settings containing typically developing children are poorly understood. One possibility is that because of the more advanced play levels of typically developing children, the integrated setting is more stimulating, responsive, and socially demanding than is the specialized setting. These effects should be apparent almost immediately and may well continue to influence the peer interactions of children with developmental delays over time. In addition, as children with and without developmental delays interact over time, benefits may also result due to learning through observation, experiencing adaptive feedback from more advanced peers, and building a shared set of understandings so essential for social play with peers. A third possibility is that the integrated program constitutes an ideal setting to carry out planned interventions designed to promote children's peer relations, often involving more developmentally advanced children. Primarily indirect evidence is available to suggest that all three types of mechanisms may be operating (Guralnick, 1986, 1990b).

As noted, should positive effects of integration be apparent almost immediately, strong support for the operation of the first mechanism related to the stimulating, demanding, and responsive nature of the integrated setting for children with developmental delays would be obtained. Direct evidence for this first alternative would provide important information for

all persons involved in establishing or refining integrated programs. In particular, this information would contribute to the knowledge base on the *potential* effectiveness of integration in connection with children's peer interactions and would be useful to early education staff, who would be encouraged to take advantage of this state-of-affairs to develop strategies that maintain or enhance this pattern.

A related issue is the extent to which children with and without disabilities do in fact become socially integrated with or accepted by their typically developing peers, especially in fully integrated (i.e., mainstreamed settings). This issue is important for a variety of reasons. From an ideological and philosophical perspective, social integration and acceptance by peers represent values central to inclusive programs (Guralnick, 1990a). From the perspective of families of children with disabilities enrolled in integrated programs, considerable concerns have been expressed with respect to possible social isolation and peer rejection of their children (Guralnick, 1994; Guralnick, Connor, & Hammond, 1995). From a developmental perspective, significant social separation usually assessed through direct observations or lack of acceptance usually assessed through peer sociometrics in relation to children with developmental disabilities during the early phase of a mainstreamed program will likely minimize any benefits that could be derived subsequently from observational learning, adaptive feedback, and shared experiences with typically developing children. Unquestionably, social integration and acceptance patterns can be altered with experience, but reputational factors can be powerful influences (Hymel, Wagner, & Butler, 1990). Moreover, the potentially positive effects of planned interventions to promote peer interactions are not likely to generalize beyond these planned and often structured situations if social separation is extensive.

The limited information that is available with respect to children with developmental delays suggests that social separation

does occur, and the degree of social separation varies directly with the severity of the child's delays (see Guralnick, 1986). Even during the first 2 weeks of a mainstreamed program, a tendency toward social separation between children with mild developmental delays and typically developing children has been detected (Guralnick & Groom, 1987). In general, findings suggest that typically developing children prefer to interact with other typically developing children but that children with developmental delays show no preferences or also prefer typically developing children (Guralnick, 1990b; Guralnick & Groom, 1987). In many ways, some degree of social separation is to be expected simply based on the unusual peer interaction difficulties that have been well-documented for children with developmental delays (Guralnick & Groom, 1985, 1987; Guralnick & Weinhouse, 1984; Kopp, Baker, & Brown, 1992). In addition, children with mild developmental delays are less accepted overall based on peer sociometric measures (Guralnick & Groom, 1987). Nevertheless, due to the absence of systematic research on this issue, the nature and extent of the social integration and social acceptance of children with developmental delays in mainstreamed settings is not well understood.

Accordingly, our primary purpose in this investigation was to examine the immediate effects of mainstreamed and specialized settings on the peer interactions of preschool children with and without developmental delays. In a related issue, the extent of social integration and social acceptance occurring in the mainstreamed setting was evaluated as children became acquainted with one another. To accomplish this, we established a series of mainstreamed and specialized playgroups. Children participated for a 2-week period in three types of playgroups consisting of (a) only children with mild developmental delays (specialized mildly delayed), (b) only typically developing children (specialized typically developing), and (c) play-

groups including children from both groups (mainstreamed).

The playgroup methodology used in this study is similar to that described by Coie and Kupersmidt (1983) and Dodge (1983) involving typically developing children varying in social status and to the work of Guralnick and Groom (1987) and Guralnick, Connor, Hammond, Gottman, and Kinnish (in press), who established a series of mainstreamed playgroups involving children with developmental delays or communication disorders. In all of these studies, expected developmental patterns emerged even in the context of short-term playgroups. In addition, the playgroup methodology has a number of features uniquely suited to the study of emerging social interaction patterns. First, children unacquainted with one another can be brought together to form the playgroups, thereby allowing the study of peer-related social competence and social integration to occur initially free of reputational factors or previously established social status hierarchies (Hymel et al., 1990). Second, control over subject selection and the ability to achieve appropriate matches of family and child characteristics in the formation of the playgroups minimize sampling bias inherent in the study of intact groups of mainstreamed or specialized children. Finally, the design of the laboratory housing the playgroups allowed us to use sophisticated recording techniques and apply multiple coding systems.

Method

Overview

Previously unacquainted groups of children were brought together to form a series of 12 separate playgroups ($N = 6$ children per playgroup). The playgroups differed in terms of two factors: (a) the developmental characteristics of the children in the playgroups—referred to as the group variable (i.e., children with developmental delays or typically developing children); and (b) the social environment—

referred to as the setting variable (i.e., playgroups consisting only of other children with similar developmental characteristics—all typically developing children or all children with developmental delays—or those in which children from both groups participated).

Of the 12 playgroups, 6 were specialized, 3 consisted of only typically developing children, and 3 were composed of only children with developmental delays. The remaining 6 playgroups were mainstreamed; each consisted of 4 typically developing children and 2 children with developmental delays. As described later, a matching procedure ensured that typically developing children assigned to mainstreamed or specialized playgroups, as well as children with developmental delays assigned to mainstreamed or specialized playgroups, were equivalent within each of the two types of playgroups in terms of child characteristic measures (chronological age [CA], cognitive ability, language, adaptive behavior, and behavior problems). A similar matching process ensured equivalence across *all* groups for family demographic measures family (social status, marital status). For each 2-week playgroup, the social and play interactions of each child were recorded during a designated free-play period. At the conclusion of each playgroup, peer sociometric ratings were completed for each of the 6 children.

Subjects

Typically developing children were recruited through direct contact with administrators and teachers in public and private nursery schools and daycare programs. Children with developmental (cognitive) delays were recruited from community-based preschool programs and from rosters of children who received clinical evaluations from diagnostic clinics. The CA range for all subjects was established at 4.25 to 5.50 years. Only boys were selected to participate in the playgroups because re-

sources were not available to include gender as an additional independent variable, and more boys were available in community preschools. Similarly, to avoid potential confounds due to race, only Caucasian children were selected. In addition, children were excluded from participating for any of the following reasons: (a) three siblings within 3 years of age of the child being considered, (b) teacher reports of major disruptive behavior problems, (c) legal blindness or major uncorrected hearing loss, (d) significant motor problems, (e) acquaintance with other children in the playgroup, and (f) living with the primary caregiver less than one year.

For selection and matching purposes, the revised version of the Wechsler Preschool and Primary Scale of Intelligence—WPPSI-R (Wechsler, 1989) was administered individually to all prospective children. Full Scale IQ (FSIQ) scores as well as performance (PIQ) and verbal (VIQ) scores were obtained. Two language tests also were administered individually to each child. First, the revised version of the Test for Auditory Comprehension of Language (Carrow-Woolfolk, 1985) was administered. This test consists of scales for word classes and relations, grammatical morphemes, and elaborated sentences. A total score standard score is also obtained. Second, to supplement the receptive language assessment of the Test for Auditory Comprehension of Language-Revised, we administered the expressive components of the Preschool Language Scale (Zimmerman, Steiner, & Pond, 1979). Because of the lack of standardization, only raw scores were used (range = 0 to 48 for verbal ability and 0 to 23 for articulation).

In addition to direct assessments of children's cognitive and language development, mothers served as respondents for assessments of their child's adaptive behavior and behavior problems. First, trained interviewers administered the Vineland Adaptive Behavior Scales Sur-

vey Form (Sparrow, Balla, & Cicchetti, 1984) to mothers. Standard scores were obtained for each of the four domains (Communication, Daily Living Skills, Socialization, and Motor Skills) as well as for the total adaptive behavior score. Second, the mother's assessment of her child's behavior problems was based on the Child Behavior Checklist (Achenbach & Edelbrock, 1981). Mothers rated the frequency of different behavior problems from a 118-item questionnaire using a 3-point scale. Only the broad band internalizing and externalizing scales T scores in conjunction with a total behavior problem score were used for subject selection and matching purposes. Higher scores indicate greater perceived behavior problems. Finally, responses to a parent questionnaire provided basic demographic information. The Hollingshead Four Factor Index of Social Status (Hollingshead, 1975) was used to calculate a measure of family status (range = 8 to 66).

Beyond the inclusionary and exclusionary criteria applied to all subjects as previously noted, specific criteria also were established for each of the two groups of children differing in developmental characteristics. Specifically, typically developing children were included if they achieved an FSIQ between 90 and 130. Children were excluded, however, for any of the following reasons: (a) VIQ or PIQ lower than 90, (b) Test for Auditory Comprehension of Language-Revised total score less than 90, (c) Child Behavior Checklist total problem score greater than the 90th percentile, (d) enrolled in a preschool program in which more than 15% of the children had established disabilities, or (e) had a sibling with an established disability. Similarly, children with developmental delays were included if they achieved an FSIQ between 52 and 80. Children in this group were excluded, however, for any of the following reasons: (a) PIQ greater than 90, (b) Child Behavior Checklist total problem score greater than the 98th percentile or teacher

reports of continuous and substantial disruption, and (c) a Test for Auditory Comprehension of Language-Revised total score less than 55 or greater than 90.

Matching Procedures

Children with developmental delays were first identified for each playgroup, with typically developing children participating in both mainstreamed and specialized groups subsequently recruited from the same neighborhoods to maximize similar demographic characteristics. Children were tested on a continuous basis across a 4-year period, and playgroups were formed when an appropriate number of children meeting criteria were recruited. Specialized and mainstreamed playgroups were interspersed over the 4 years. On occasion, a child meeting established criteria was not included if his test scores were inconsistent with matching projections for the demographic and child characteristic measures.

As presented in Table 1, as a result of this process, child characteristic measures were equivalent for the typically developing children participating in the mainstreamed and specialized playgroups, $p > .05$. The only exception was that typically developing children participating in specialized playgroups had a higher Vineland Daily Living Skills score than did typically developing children participating in the mainstreamed playgroups, $p < .05$. Equivalent scores also were obtained across all child characteristic measures for children with developmental delays participating in specialized and mainstreamed settings.

As expected, significant differences were obtained for most of the child characteristic measures (see Table 1 for details when comparing typically developing children and children with developmental delays). The only exceptions were child's CA, the PIQ-VIQ discrepancy, and the Child Behavior Checklist externalizing factor, $p > .05$. Finally, for family demographics, 91.7% of the

Table 1
Child Characteristic Measures by Group and Setting

Child characteristic	Typically developing				Developmentally delayed			
	Specialized (n = 18)		Mainstreamed (n = 24)		Specialized (n = 18)		Mainstreamed (n = 12)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
CA (months)	56.28	3.51	57.25	4.00	58.83	4.90	57.50	4.78
WPPSI-R								
Full Scale IQ*	110.06	10.88	111.83	10.74	66.00	9.95	67.92	8.06
Performance IQ*	110.83	13.01	109.38	10.59	68.00	11.38	70.08	8.12
Verbal IQ*	107.39	12.19	110.42	11.08	70.06	9.69	71.33	9.28
Performance-Verbal IQ	3.44	16.83	-1.04	11.51	-2.06	10.71	-1.25	9.79
Full Scale MA*	61.51	7.18	63.38	7.89	38.22	6.93	38.80	5.91
Performance MA*	61.93	8.19	62.23	7.50	39.44	7.75	40.08	6.43
Verbal MA*	60.03	7.84	62.84	8.05	40.51	6.70	40.68	6.08
TACL-R								
Total Scale*	105.06	7.05	109.21	9.74	75.33	9.64	73.00	11.17
Word Class & Relations*	106.33	9.25	110.63	12.05	76.44	18.74	80.17	10.52
Grammatical Morphemes*	103.06	9.73	105.29	10.65	78.22	9.06	71.42	14.42
Elaborated Sentences*	105.06	13.48	109.83	10.89	82.89	8.07	80.75	11.31
PLS								
Verbal ability*	35.83	4.97	37.33	4.17	19.11	9.00	21.83	7.30
Articulation*	19.83	2.29	21.00	2.60	12.83	6.38	15.60	5.32
Vineland								
Total adaptive behavior*	97.56	11.12	92.25	10.11	67.56	7.90	70.25	9.27
Communication*	96.00	9.76	96.50	7.99	77.00	12.50	76.17	11.56
Daily Living Skills*	97.61	11.06	88.38	10.95	70.11	6.93	74.00	12.47
Socialization*	99.39	8.53	98.63	10.40	78.67	9.13	81.33	12.69
Motor Skills*	100.83	9.65	94.83	14.76	64.67	14.22	70.83	13.30
CBCL								
Total behavior problems*	46.61	7.82	47.83	8.00	55.11	8.79	52.42	10.08
Externalizing	48.61	8.42	48.13	9.83	50.44	10.55	49.58	12.41
Internalizing*	46.00	9.31	48.21	7.57	57.94	10.06	53.50	6.92

Note. WPPSI-R=Wechsler Preschool and Primary Scale of Intelligence; TACL-R=Test of Auditory Comprehension-Revised; PLS=Preschool Language Scale; Vineland=Vineland Adaptive Behavior Scales; CBCL=Child Behavior Checklist.

*Indicates a significant difference, $p < .05$, between typically developing children and children with developmental delays.

mothers were partnered, with an average family social strata based on the Hollingshead index of 2.15 (medium business, minor professional). The four groups did not differ on these two measures, which were analyzed with the χ^2 and Kruskal-Wallis one-way analysis of variance, respectively.

Playgroup Setting and Procedure

Each 6-child playgroup operated 2.5 hours per day, 5 days per week, for 2 weeks (10 sessions) in either a morning or afternoon time period. Children arrived in separate vehicles via parents or drivers, and parents were asked to avoid contact with the other families or children for the duration of the playgroup. Parents were paid \$100 plus transportation expenses.

Playgroups were supervised by a teacher and graduate assistant in a specially designed laboratory playroom. Children participated in a series of group and individual activities typical of preschool programs, including circle time, music, art, snack, and story. During two daily 30-minute free-play periods, children had access to the extensive array of toys and equipment found in the playroom. Separate areas provided opportunities for house-keeping, blocks, puzzles, games, and precast and manipulative toy play activities, as well as an option for individual reading. Although the teacher generally encouraged social and play interactions among the children in other activities, during free-play periods the teacher limited her interactions to providing assistance when necessary.

Children's social and play interactions were videorecorded using split-screen

technology: two remote controlled cameras mounted at either end of the playroom and a hand-operated camera in an adjacent observation room. The child being recorded at the time focal child wore a specially designed lightweight vest equipped with a professional quality wireless microphone and transmitter secured in a hidden pocket in the back of the vest. Other microphones were placed discreetly throughout the room and a control panel of mixers balanced the auditory signals.

Each child was observed for a total of 60 minutes during free play over the 2-week period. Recording commenced on the second playgroup day and was divided into segments of 10 consecutive minutes for each of 6 recording periods per child. The order of recording children was randomized within blocks of six 10-minute segments, and no child was observed more than once per day. In addition, recordings were distributed such that each child was videotaped on three occasions within the first week (Time 1) and on three occasions during the second week (Time 2).

As described later, videotaped recordings were analyzed using two separate scales, one focusing on more global measures of social participation and cognitive play and the other on individual social behaviors. A peer sociometric measure was administered to each child at the completion of the study.

Observational Measures

Social Participation and Cognitive Play. Parten's (1932) index of social participation formed the basis for characterizing global differences in children's peer relationships. Despite legitimate concerns regarding the sequential and hierarchical nature of this measure of social participation (Bakeman & Brownlee, 1980; Roper & Hinde, 1978; Rubin, Maioni, & Hornung, 1976; Smith, 1978), variations and modifications of the Parten scale, many including measures of cognitive play based on Smilansky's (1968) categories (see Rubin, 1985), appear to have considerable utility.

Various forms of the scale have been shown to be sensitive to (a) developmental changes over time (Barnes, 1971; Rubin & Krasnor, 1980; Rubin, Watson, & Jambor, 1978; Smith, 1978), (b) socioeconomic status (Rubin et al., 1976), (c) environmental conditions (Vandenberg, 1981), (d) the familiarity of peers (Doyle, Connolly, & Rivest, 1980), and (e) differences between mixed-age and same-age groupings (Goldman, 1981). Moreover, variations of the scale have been applied effectively to populations of children with disabilities (Guralnick & Groom, 1985, 1987; Guralnick et al., in press; Higgenbotham & Baker, 1981) and may well be of value in identifying children at risk for developmental problems (Rubin, 1982; Rubin, LeMare, & Lollis, 1990).

A time code superimposed on each videotape in conjunction with a remotely controlled tape-stop device allowed observers to view tapes at 10-second intervals. Coders recorded the categories of social participation and level of cognitive play where required during each 10-second interval using a slightly modified version of the scale developed by Rubin (1985). This scale consists of 10 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 four measures of cognitive play based on the work of Smilansky (1968): (a) *functional* (simple repetitive play), (b) *constructive* (learns to use materials, creates something), (c) *dramatic* (role taking and pretend play), and (d) *games with rules* (child behaves in accordance with prearranged rules). If any 10-second interval was coded as either solitary, parallel, or group play, then one of the four cognitive play categories was also scored.

The 7 remaining categories consisted of the following: (a) *unoccupied behavior*

(child not playing), (b) *onlooker behavior* (child watches other children but does not enter into play), (c) *reading or listening* (reading, leafing through a book, listening to a tape), (d) *exploration* (examining physical properties of objects), (e) *active conversation* (talking, questioning, and suggesting to other children but not playing), (f) *transition* (moving from one activity to another), and (g) *adult-directed* (any activity with an adult).

In order to obtain information with regard to whom the focal child interacted with, we noted the identity of the peer for the group, parallel play, active conversation, and onlooker categories whenever these categories were coded. 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 (1985) manual. (Coding rules and related modifications of this scale as well as the coding manual for the Individual Social Behavior Scale [see later discussion] may be obtained by writing the first author).

Individual Social Behaviors. Each videotape was reviewed a second time in order to examine specific peer-related social behaviors. For this purpose, the Individual Social Behavior Scale was developed based on the work of White and Watts (1973) and adapted in a manner similar to the approach taken by Doyle et al. (1980) and by Guralnick and Groom (1985, 1987). The current adaptation was most recently applied by Guralnick et al. (in press) to children with communication disorders. The cluster of individual social behaviors originally described by White and Watts (1973), including the ability to gain the attention of peers, use peers as resources, express affection, and direct peers successfully during play, has been employed extensively. These component behaviors increase over the preschool years, correspond to other measures of social competence with peers (such as teacher ratings and peer sociometrics), vary with the familiarity of interacting children, and corre-

late positively with social participation (Connolly & Doyle, 1981; Doyle et al., 1980; Wright, 1980).

Specifically, observers recorded continuously the occurrence of individual social behaviors defined by 34 categories. The following categories were designed to record social interactions of the focal child as directed to peers: (a) seeks attention of peer; (b) uses peer as a resource; (c) leads in peer activities—direct, positive, or neutral; (d) leads in peer activities—indirect, positive, or neutral; (e) leads in peer activities—direct, negative; (f) leads in peer activities—indirect, negative; (g) imitates a peer; (h) engages in observation of peer; (i) joins peers in specific activity; (j) verbally supports peer's statement; (k) verbally competes with peer; (l) shows pride in product to peer; (m) competes with peer for adult's attention; (n) expresses affection to peer; (o) shows empathy toward peer; (p) expresses hostility toward peer; (q) takes unoffered object; (r) defends property; and (s) seeks agreement from peer.

With the exception of the involved observation and defends property categories, each of the focal child individual social behaviors just listed was classified as to whether it was an initiation. A *focal child initiated event* is one in which no prior verbal or nonverbal interaction occurred for at least 3 seconds.

Fourteen of the remaining categories focused on the social behaviors of the focal child in response to directed activities of peers. Categories consisted of following the lead of a peer (4 categories tied to direct/indirect and positive, neutral/negative dimensions), failing to follow the lead of a peer (4 categories as above), responding and failing to respond to a peer's attempt to use the focal child as a resource (2 categories), responding and failing to respond to a peer's attention-seeking behavior (2 categories), and responding and failing to respond when a peer sought agreement from the focal child (2 categories). The final category was one

in which the focal child served as a model for a peer.

Ten of the categories designed to record the social interactions of the focal child as directed to peers *a* through *f*, *m*, *p*, *q*, and *r* also were judged as either successful or unsuccessful. Definitions for successful or unsuccessful social interactions were specific to each social behavior category. For example, the gains the attention of peer category would be coded as successful if the peer attended within 5 seconds, either visually or verbally, or moved closer to or touched the focal child. The response of the peer must be appropriate to the attention-getting effort of the focal child. Finally, the identity of the peer interacted with also was recorded following procedures outlined previously for the social participation scale.

Coders were free to review any segment of the tape as often as needed. The coding protocol was divided into 30-second 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 (see later discussion within the event-based system).

Peer Sociometric Ratings. Following Asher, Singleton, Tinsley, and Hymel (1979), at the end of the playgroup we presented to each child color Polaroid photographs of each playgroup participant and asked him to place the photographs into one of three boxes. One box contained a drawing of a happy face for "children you really like to play with a lot," a second contained a neutral face for "children you kinda like to play with," and the third contained a sad face for "children you don't like to play with." Prior training with pictures of different foods established that each child understood the rating procedure. Ratings were assigned a score of 3 for *positive*, 2 for *neutral*, and 1 for *negative* in order to obtain a composite score in the form of an overall rating. In addition, separate scores were obtained for the number of

positive assignments and the number of negative assignments.

Reliability. Prior to coding, five raters were trained for a period of 12 to 19 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 average criterion necessary for participation of 70% interobserver agreement for each of the major categories for ten 10-minute segments from a reliability tape containing complex segments for each of the two scales. Reliability also was obtained for each rater during the course of the study for 25% of the playgroup tapes selected on a random basis but balanced to ensure representation from the two types of social settings, groups, and time.

For the social participation and cognitive play scale, reliability was based on percentage agreement obtained across each of the 10-second observation intervals (number of agreements divided by the total number of observations and transformed to a percentage). Cohen's (1960) kappa also was calculated where appropriate. For prestudy reliability, raters agreed on a mean of 84% (range = 83% to 85%) of the intervals, $\kappa = .80$, for the 10 categories of the social participation scale. Using only those instances in which observers agreed that a cognitive play coding was required, we found that interobserver agreement averaged 94% (range = 93% to 96%) for the 4 cognitive play categories. Average agreement with regard to the identity of the peer involved in the social interaction was 85% (range = 80% to 93%). During the course of the study, average interobserver agreement continued to be high in all instances for each of the 12 groups: social participation, 86% (range = 82% to 90%), $\kappa = .81$ (range = .76 to .85); cognitive play, 91% (range = 82% to 97%); and the identity of the peer, 90% (range = 84% to 96%).

For the individual social behavior scale, raters were considered to be in agreement if codes matched within a specified 10-second 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 34 individual social behavior categories, a "no-interaction" event was included to complete the possible options within each interval. Percentage agreement was obtained for each 10-minute segment by taking the total number of agreements, dividing by the total number of observed individual social interactions, and transforming to a percentage. Calculated in this manner, the average prestudy agreement for this scale was 85% (range = 84% to 87%), $\kappa = .75$. Given agreement on the occurrence of a particular social interaction, observers further agreed on an average of 82% (range = 80% to 90%) of the occasions as to whether the event could be classified as successful or unsuccessful, an average of 79% (range = 67% to 88%) as to whether or not selected focal child behaviors were initiations, and an average of 98% (range = 97% to 99%) 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: individual social behaviors, 87% (range = 83% to 92%), $\kappa = .78$ (range = .76 to .83); successful/unsuccessful, 91% (range = 84% to 100%); initiations, 80% (range = 67% to 96%); and identity of peer, 96% (range = 91% to 99%).

Results

For each measure or group of measures derived from the two observational scales, data were summed across the first three and the last three observation periods, and a series of Group (developmentally delayed, typically developing) \times Setting (mainstreamed, specialized) \times Time (Time 1, Time 2) mixed-model analyses of variance was carried out. When peer group membership children who were targets of the social interactions of the focal child was included during separate analyses of the main-

streamed settings, analyses consisted of 2 (group) \times 2 (time) \times 2 (peer group: developmentally delayed), typically developing analyses of variance, with Time and Peer Group as within factors. In those instances in which multivariate analyses of variance were applied, Wilks' criterion was used. Whenever frequency data were transformed to proportions, the arcsine transformation was employed. However, to facilitate the interpretation of results, we presented untransformed scores in the tables.

Effects of Setting, Group, and Time

A multivariate analysis of variance carried out on the 10 social participation categories revealed significant multivariate effects or strong trends only for the setting, $F(10, 59) = 1.96, p < .055$, and group, $F(10, 59) = 3.56, p < .001$, factors. For setting, separate univariate effects were obtained for the parallel play, $F(1, 68) = 8.70, p < .01$, and unoccupied, $F(1, 68) = 5.26, p < .05$, categories. As can be seen in Table 2, parallel play occurred more frequently in the mainstreamed setting, but children were unoccupied approximately twice as often in the specialized setting. For the group factor, typically developing children engaged in more group and parallel play, $F_s(1, 68) = 7.04$ and 9.13 , respectively, $p_s < .01$, as well as more active conversation with peers, $F(1, 68) = 13.47, p < .001$. In contrast, children with developmental delays engaged in more solitary play, $F(1, 68) = 7.86, p < .01$, transitions, $F(1, 68) = 15.22, p < .001$, and interactions involving adults, $F(1, 68) = 6.25, p < .05$. Separate analyses for the cognitive play categories produced an interesting pattern. Specifically, typically developing children engaged in more dramatic, $F(1, 68) = 7.94, p < .01$, but less functional play, $F(1, 68) = 8.40, p < .005$. The proportion of functional play, although quite low overall (mean = 5.9%), did increase from Time 1 to Time 2, $F(1, 68) = 5.78, p < .05$. Correspondingly, as indicated

Table 2
Mean Frequencies for Social Participation and Cognitive Play Measures by Subject Group and Setting

	Typically developing				Developmentally delayed			
	Specialized (<i>n</i> = 18)		Mainstreamed (<i>n</i> = 24)		Specialized (<i>n</i> = 18)		Mainstreamed (<i>n</i> = 12)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Social participation and cognitive play								
Social participation								
Play								
Group	48.72	36.24	38.13	27.82	25.89	31.35	22.25	20.17
Parallel	74.17	23.99	109.54	44.37	48.06	47.76	73.42	50.74
Solitary	134.50	53.91	109.96	44.89	163.39	59.27	160.25	82.08
Nonplay								
Reading	3.28	5.73	6.33	12.50	9.00	18.10	1.33	4.31
Exploration	.39	1.04	.67	1.01	2.22	3.59	.33	.49
Active conversation	32.56	17.09	36.92	23.24	12.06	11.58	23.92	19.85
Transition	10.94	4.92	11.00	4.64	18.83	14.79	19.92	8.07
Onlooker	29.61	17.39	25.88	17.59	35.33	43.32	30.75	27.81
Unoccupied	18.44	20.40	12.67	6.86	33.89	34.38	15.92	15.45
Adult-directed	4.00	4.93	5.58	5.58	8.39	7.54	9.50	9.95
Cognitive play								
Dramatic	40.42	18.40	45.35	16.07	23.66	17.15	35.42	23.18
Constructive	55.00	17.68	53.56	16.03	66.50	14.37	56.99	24.72
Functional	4.58	5.47	3.09	3.39	9.84	11.50	7.59	6.78

Note. Data are summed across six observations; data for cognitive play categories are in percentages.

by a significant Setting \times Time interaction, $F(1, 68) = 6.93, p < .05$, and follow-up tests, constructive play decreased from Time 1 to Time 2, but only for children participating in the specialized setting.

A multivariate analysis of variance carried out on the frequency of the 15 most commonly occurring individual social behaviors revealed significant multivariate effects for group, $F(15, 54) = 3.56, p < .001$, and time, $F(15, 54) = 2.40, p < .01$. Table 3 presents the data for all 34 individual social behaviors. As indicated in the table, typically developing children were far more interactive than were children with developmental delays, with significant univariate effects obtained for lead peer direct, positive or neutral, $F(1, 68) = 10.71, p < .01$; lead peer indirect, positive or neutral, $F(1, 68) = 34.00, p < .001$; use peer as resource, $F(1, 68) = 17.03, p < .001$; follow peer direct, positive or neutral, $F(1, 68) = 12.52, p < .001$; and respond to peer seeking to use focal child as a resource, $F(1, 68) = 24.49, p < .001$. Univariate effects for time revealed only that children failed to follow the directives, positive or neutral, of peers more frequently during Time 2 than Time 1. The overall frequency of this measure was quite low, however (see Table 3).

In order to evaluate the affective quality of the exchanges, we identified categories reflecting negative social interactions from among the 34 individual social behaviors. Those behaviors included were hostility, lead direct negative, lead indirect negative, follow lead direct negative, follow lead indirect negative, fail to follow lead direct negative, fail to follow lead indirect negative, fail to follow lead direct positive or neutral, fail to follow lead indirect positive or neutral, fail to respond to a peer's attempt to use focal child as a resource, take unoffered object, defend property, and fail to respond to a peer's attempt to gain focal child's attention. All other behaviors constituted a positive behavior grouping. The frequency of negative social behaviors was then transformed into a proportion to total individual social behaviors and subjected to a 2 (group) \times 2 (setting) \times 2 (time) analysis of variance. This analysis revealed that children with developmental delays displayed a higher proportion of negative social behaviors than did typically developing children (means = .43 and .36, respectively, $F(1, 68) = 8.67, p < .01$), and that a greater proportion of negative social behaviors occurred in the mainstreamed than in the specialized setting (means = .40 and .37, respec-

Table 3
Mean Frequencies for Individual Social Behaviors by Subject Group and Setting

Individual social behavior	Typically developing				Developmentally delayed			
	Specialized (<i>n</i> = 18)		Mainstreamed (<i>n</i> = 24)		Specialized (<i>n</i> = 18)		Mainstreamed (<i>n</i> = 12)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Directed to peer (P)								
Observation	14.89	13.04	10.17	9.03	18.61	32.69	16.83	17.47
Joins	5.50	4.15	7.38	4.11	3.72	2.65	6.50	5.35
Verbal support	1.89	1.88	2.63	3.23	.33	.84	.92	1.62
Verbal competition	.33	1.19	.46	1.02	.00	.00	.08	.29
Pride in product	.17	.51	.04	.20	.06	.24	.08	.29
Compete with P for adult	.00	.00	.00	.00	.00	.00	.00	.00
Affection	.17	.51	.17	.48	.44	.92	.17	.39
Empathy	.00	.00	.00	.00	.00	.00	.00	.00
Hostility	.83	1.47	1.79	2.93	1.56	1.62	2.25	3.60
Lead P direct positive, neutral	18.89	10.99	19.29	10.76	7.28	8.15	13.33	14.93
Lead P indirect positive, neutral	13.61	8.72	13.75	7.40	3.50	4.06	4.58	5.35
Lead P direct negative	11.44	6.61	13.83	10.01	8.50	7.37	13.25	9.01
Lead P indirect negative	2.94	2.69	2.33	3.00	.78	1.40	1.50	1.83
Use P as resource	13.50	8.81	12.79	9.39	3.44	5.77	7.00	5.48
Takes unoffered object	4.78	4.35	5.46	4.19	3.89	4.04	5.92	5.20
Imitation	1.67	2.11	1.38	1.31	1.33	1.57	1.67	1.78
Seek attention of P	9.78	6.33	10.29	6.13	8.11	5.07	11.33	7.97
Seek agreement of P	2.89	3.25	4.42	8.38	.89	1.71	1.00	1.60
Response to peer								
Follow P direct positive, neutral	10.94	7.82	8.88	5.28	3.89	4.40	6.00	4.86
Follow P indirect positive, neutral	5.83	3.45	5.04	3.61	2.61	4.31	2.25	1.82
Follow P direct negative	5.83	5.06	6.58	4.60	4.00	3.24	6.50	4.80
Follow P indirect negative	.94	.87	.75	.79	.28	.57	1.08	1.08
Fail to follow P direct positive, neutral	7.61	5.16	7.08	4.67	4.06	6.49	7.33	6.05
Fail to follow P indirect positive, neutral	5.06	2.69	4.58	4.24	2.94	4.11	3.67	3.87
Fail to follow P direct negative	3.44	2.48	4.13	5.10	4.00	4.58	8.42	9.39
Fail to follow P indirect negative	1.11	1.68	.42	.78	.39	.85	1.00	1.41
Respond to P as resource	8.44	6.61	8.08	5.67	1.61	2.40	2.75	3.82
Fail to respond to P as resource	5.11	3.38	4.58	3.39	2.28	3.01	2.50	3.99
Defends property	6.22	4.81	7.88	3.84	5.50	4.33	6.75	4.92
Respond to P attention	5.33	3.80	7.58	3.73	5.22	2.82	5.67	4.10
Fail to respond to P attention	3.56	2.81	5.08	3.24	2.83	1.69	3.67	2.93
Respond to P seek agreement	1.17	1.62	3.04	8.77	.17	.38	.33	.49
Fail to respond to P seek agreement	1.56	1.50	2.04	3.72	.33	.69	.58	.79
Other								
Being a model	1.39	1.79	1.00	1.14	.67	1.19	.83	1.40

Note. Data are summed across six observations.

tively, $F(1, 68) = 4.55, p < .05$).

A separate analysis of variance carried out on the percentage of success across all social bids (both positive and negative) did not yield any significant effects. Both groups, irrespective of setting or time, were successful on approximately half the occasions. However, similar analy-

sis for the percentage of individual social behaviors that were initiated produced significant group, $F(1, 68) = 15.54, p < .001$, and setting effects, $F(1, 68) = 5.48, p < .05$. A greater percentage of initiations were made by children with developmental delays than by typically developing children (means = 35.81% and 19.73%, respectively).

Moreover, a greater proportion of initiations occurred in the specialized than in the mainstreamed setting (means = 31.79% and 21.07%, respectively).

The final set of measures for the Group \times Setting analyses (no time factor) was obtained from the peer sociometric ratings. Three measures consisted of the number of positive ratings, the number of negative ratings, and an overall rating based on the average of five ratings one from each of the other children in a playgroup. Significant multivariate analyses of variance were obtained for group, $F(3, 66) = 3.30, p < .05$, and the Group \times Setting interaction, $F(3, 66) = 2.71, p < .05$. Separate analyses of variance, however, produced significant effects only for the Group \times Setting interaction for each of the three measures; overall, $F(1, 68) = 5.71, p < .05$, positive, $F(1, 68) = 7.97, p < .01$, and negative ratings, $F(1, 68) = 5.71, p < .05$. Follow-up analyses revealed that typically developing children received higher overall and more positive ratings, but fewer negative ratings when participating in the mainstreamed in comparison to the specialized settings, but children with developmental delays received similar ratings in both settings.

Factor Analysis and Correlations With Demographics and Child Characteristics

In order to identify important dimensions of peer-related social interactions, we carried out a principal components factor analysis using the varimax rotation. Based on previous work (Guralnick & Groom, 1990; Guralnick et al., in press), the following nine measures were selected for analysis: (a) total positive social behaviors, (b) proportion of negative social behaviors, (c) group play, (d) parallel play, (e) solitary play composite solitary, read, explore, unoccupied, (f) active conversation, (g) onlooker, (h) transition, and (i) positive peer sociometric ratings. This analysis yielded

Table 4
Rotated Factor Matrix

Measure	Factor 1	Factor 2	Factor 3
Group play	.587	-.083	.243
Positive peer sociometric ratings	.043	.080	.828
Solitary play composite	-.936	-.069	-.132
Onlooker	-.093	.858	-.015
Proportion negative social behaviors	-.134	-.661	-.496
Total positive social behaviors	.833	.410	.214
Active conversation	.708	.332	.013
Transition	.370	-.009	-.599
Parallel play	.654	-.467	.129

three factors, which accounted for 68.1% of the variance see Table 4.

The first factor accounted for 39.7% of the variance and appeared to represent a *level of social interaction* dimension, with high positive loadings on total positive social behavior, active conversation, parallel play, and group play, but a strong negative loading on the solitary composite. A second factor accounted for 17.4% of the variance and appeared to represent a dimension reflecting *interest in peers*, with high positive loadings on onlooker behavior and moderate positive loadings for total positive social behaviors and active conversation. A high negative loading was obtained for the proportion of negative social behaviors and a moderate negative loading for parallel play. The third factor accounted for only 11% of the variance and primarily reflected the contribution of the *positive peer sociometric* rating. As can be seen, the high positive rating is associated with the absence of children being in transition or engaging in a high proportion of negative behaviors.

Factor scores were then computed for each child by multiplying the factor loadings for each of the nine measures and summing. Three separate Group \times Setting analyses of variance were then carried out for children's scores on each of the factors. For the level of social interaction factor, as expected, significant effects were found for group, $F(1, 68) = 21.20, p < .001$, as typically developing children achieved higher factor scores than did children with

developmental delays. In addition, a significant setting effect was obtained, $F(1, 68) = 4.32, p < .05$. In this case, children in the mainstreamed setting obtained higher scores than did children in the specialized setting. No other effects were significant for this factor.

No significant effects were obtained for Factor 2 (interest in peers). However, the analysis of variance for Factor 3 yielded a significant group effect, $F(1, 68) = 4.75, p < .05$, and a significant Group \times Setting interaction, $F(1, 68) = 5.50, p < .05$. Consistent with previous results for the peer sociometric analyses, follow-up analyses indicated that typically developing children had higher scores in the mainstreamed than in the specialized playgroups, whereas children with developmental delays obtained similar scores in both settings.

Finally, the family demographic and child characteristic measures listed in Table 1 were each correlated with the three factor scores. This was carried out separately for the typically developing children and children with developmental delays. The level of significance was set at .01 because of the large number of correlations. With this more stringent criterion, only a small number of significant correlations were obtained. For typically developing children, correlations were obtained between Factor 3 and WPPSI-R verbal MA, $r = .46$, and CA, $r = .45$. For children with developmental delays, Factor 1 correlated with total Vineland score, $r = .42$, and the Vineland Daily Living Skills, $r = .54$. The only other significant correlation was between Factor 3 and Child Behavior Checklist Total Behavior Problems, $r = -.43$.

Acceptance and Social Integration in Mainstreamed Settings

A separate series of analyses was carried out in order to evaluate the extent to which children with developmental delays were accepted and socially integrated within the mainstreamed playgroups. First, children

with developmental delays and typically developing children were contrasted in terms of the overall peer sociometric rating to determine their level of social acceptance in the mainstreamed setting. Also of interest was whether these ratings were similar when judged by children with and without developmental delays. Accordingly, a 2 (group) \times 2 (peer group) analysis of variance was carried out, which produced only a significant group effect, $F(1, 34) = 5.36, p < .05$. As found in the previous analysis of sociometric ratings across settings, typically developing children received higher overall ratings than did children with developmental delays (means = 2.63 and 2.23), respectively in the mainstreamed playgroups. Moreover, children with and without disabilities rated both peer groups similarly.

Second, the degree to which children were successful in gaining a response to their social bids when the peer was a child with developmental delays or a typically developing peer was examined in a 2 (group) \times 2 (peer group) \times 2 (time) analysis of variance. A strong trend for the Group \times Peer Group interaction, $F(1, 34) = 3.87, p = .057$ (follow-up tests produced significant effects, $p < .05$), suggests that children with developmental delays may be at a slight disadvantage when interacting with typically developing children (mean success = 43.25% in comparison to interactions involving only typically developing children mean success = 53.28%). However, when social bids were directed to children with developmental delays, success was virtually identical for children from either group (overall mean = 48.34).

Finally, to assess the extent to which children with developmental delays were socially integrated in the mainstreamed playgroups, we applied a preference technique developed by Guralnick and Groom (1987). In this technique, preference scores are derived for each of the two time periods for each child within a group in relation to children in each of the two peer groups available for social interaction. To obtain different indices of social integra-

tion, we derived four such preference scores. The first two measures were taken from the Social Participation and Cognitive Play Scale and consisted of an active interaction composite group (play plus active conversation categories) and a passive interaction composite (parallel play plus onlooker categories). The second set of indices was based on the Individual Social Behavior Scale consisting of the composite categories of total positive and total negative social behaviors (frequencies) described earlier.

To obtain a preference score, we first determined the proportion of interactions *expected* to occur to each of the two peer groups for each child within a playgroup for each time period. This expected proportion was based on the number of children representing the two peer groups who were available for interaction for each of the six sessions. For example, if the preference score was being determined for a typically developing child, and, assuming no absences, the expected proportions associated with each of the peer groups would be .60 (3/5) to typically developing children and .40 (2/5) to children with developmental delays. Taking absences into account, we averaged the first three and second three playgroup sessions, which yielded expected proportions for Time 1 and Time 2. Accordingly, these *expected* values reflected the proportion of the four indices (active and passive interactions, total positive and negative individual social behaviors) that should have been associated with each peer group strictly on the basis of the number of children available in each peer group.

The *observed* proportion of interactions was obtained for each focal child by transforming the actual frequencies of occurrence separately for each of the four indices into a proportion of the total interactions occurring with children in each of the two peer groups. These were then averaged for each child over the first three and last three sessions. A preference score was then derived consisting of the observed proportion of interactions minus

the expected proportion to each peer group for each of the two time periods. Positive scores reflect a preference for a peer group, whereas negative scores reflect lower than anticipated interactions with that peer group.

A series of 2 (group) \times 2 (peer group) \times 2 (time) analyses of variance was carried out separately for each of the four indices of social integration. It is important to note that due to the nature of the derived score, the sums of squares for the group, time, and Group \times Time interaction will equal zero. For the active social play measure, a significant Group \times Peer Group interaction was obtained, $F(1, 34) = 13.61, p < .001$. Follow-up analyses revealed that children in the typically developing group preferred to interact with other typically developing children, but no preference was found for children with developmental delays. The passive social play measure yielded slightly different findings. Specifically, a main effect for peer group, $F(1, 34) = 7.48, p < .01$, indicated that, overall, children with developmental delays were less preferred play partners than were typically developing children. However, a strong trend for the Group \times Peer Group interaction, $F(1, 34) = 3.82, p < .059$, confirmed by follow-up analyses, reflected the same pattern obtained for the active social play measure. For the two measures based on the Individual Social Behavior Scale, the positive composite yielded a significant Group \times Peer Group interaction, $F(1, 34) = 10.52, p < .01$, following the pattern described for the active and passive social play measures. In contrast, the negative composite did not produce any significant effects.

Discussion

The results of this study revealed that young children with and without developmental delays are more interactive with their peers in mainstreamed as opposed to specialized settings. Of importance, virtually all of these effects were apparent

within the first week of the playgroups. Specifically, children who participated in playgroups with unacquainted peers were unoccupied nearly twice as often (and engaged less frequently in parallel play) when these playgroups were specialized rather than mainstreamed. Moreover, constructive play decreased across the 2-week period of the playgroups, but only when children participated in the specialized settings. Complementing these findings for specific measures was the effect of setting on children's levels of social interaction factor scores, which were composed of measures that included group play, positive social behaviors, active conversation, and parallel play. Once again, children's levels of social interaction were higher in the mainstreamed in contrast to the specialized setting.

Findings of this study confirm and extend previous research suggesting that mainstreamed settings are more supportive of the peer interactions of children with developmental delays than are specialized settings (e.g., Guralnick & Groom, 1988). In fact, despite the absence of an overall Group \times Setting interaction, inspection of Table 3, in particular, suggests a more consistent and substantial effect of setting for children with developmental delays than for typically developing children. In addition, because benefits appear almost immediately, they are likely to be related to the social demands and interaction levels associated with the typically developing children in the setting. Indeed, as expected, the interaction levels of typically developing children far exceeded those of children with developmental delays. The comparatively high frequency (see Table 3) with which typically developing children engaged in directive type behaviors in particular (e.g., lead direct and indirect) suggests that such children may be adopting an organizing role during play that, at least initially, includes children with and without developmental delays. Previous research has demonstrated that directive-type behaviors of children with develop-

mental delays are especially problematic (Guralnick & Groom, 1985, 1987) and may, therefore, create a unique set of difficulties for children with developmental delays in specialized settings.

It is important to point out that the benefits of mainstreamed settings found in this study applied to typically developing children as well. The social demands and interaction level explanations cannot, of course, provide an understanding of these results. Perhaps the diversity of developmental characteristics found in mainstreamed settings is a contributing factor, requiring typically developing children to exert more of a leadership role. However, research focusing on settings that include children at different CAs has found that older children's peer interactions do not benefit from mixed-age environments (e.g., Bailey, McWilliam, Ware, & Burchinal, 1993), suggesting that other explanations should be considered. It is interesting that typically developing children received higher overall ratings as well as more positive but fewer negative assignments in the mainstreamed than in the specialized settings, as judged by their peers in the sociometric task. These higher ratings were not inflated by the children with developmental delays, as revealed by separate analyses of the mainstreamed playgroups. Perhaps specific features of the mainstreamed social environment are creating a more positive climate for children's peer relations. Alternatively, contrasts between the social skills of children with and without developmental delays may have been responsible for this difference on the sociometric ratings. In any event, it is difficult to predict whether the observed benefits associated with the mainstreamed setting will be retained for typically developing children over time or revert to the more typical finding of no advantages nor adverse effects on children's peer interactions as a consequence of setting.

The fact that a greater proportion of initiations occurred in specialized than in mainstreamed settings suggests that social exchanges in the specialized setting were

brief and not as well-integrated. The finding that the proportion of social interactions that were initiations for children with developmental delays was nearly twice that of typically developing children supports this explanation. However, the finding that both groups of children had a higher proportion of negative social interactions in mainstreamed than in specialized settings is of concern. Perhaps the higher activity levels in the mainstreamed setting created proportionally greater opportunities for conflict to arise see "fail to follow" categories in Table 3. Nevertheless, despite this concern, the most consistent immediate effects of mainstreamed in comparison to specialized settings is one of increased peer-related social interactions. It is this initial positive interaction pattern that can be capitalized upon in mainstreamed early education settings to develop systematic intervention programs for children with developmental delays soon after the program begins.

The degree to which children with developmental delays are accepted and socially integrated in mainstreamed settings constitutes an important related issue. Consistent with previous research based on peer sociometric ratings (Guralnick & Groom, 1987), overall, children with developmental delays were less accepted in the mainstreamed playgroups. In addition, ratings were found to be similar when made by children with or without developmental delays. Although alternative explanations are possible (see Guralnick, 1990b; Guralnick & Groom, 1987), the most plausible basis for this lower level of acceptance is the relative lack of peer-related social competence exhibited by children with developmental delays, a pattern that is apparent almost immediately.

These peer sociometric ratings also were consistent with results based on a series of behavioral indices of social integration. For observational measures consisting of active and passive social play composites and a positive social interaction composite, it was evident that typically developing children preferred to interact

with other typically developing children, whereas no preference was obtained for children with developmental delays. However, for the final index, the negative social behavior composite, no preferences by either group to interact with children with or without disabilities were observed.

How the lower ratings of social acceptance and the absence of complete social integration for children with developmental delays in mainstreamed settings apparent during the first 2 weeks of the playgroups will influence the subsequent development of their peer interactions is difficult to determine. If exclusion from social play becomes a prominent feature of the social interaction patterns found in mainstreamed settings, then opportunities to benefit from participation with typically developing children over time will certainly be minimized. Nevertheless, despite the differences in acceptance and social integration found in this study, closer inspection of the data reveals that, even during the first 2 weeks, interactions between children with and without developmental delays occurred with considerable frequency. On an absolute basis, approximately 75% of the overall social interactions of children with developmental delays and nearly 78% of group play involved typically developing children. Consequently, unless the initial levels of acceptance and social integration for children with developmental delays change substantially, the presumed beneficial effects associated with and frequent exchanges occurring among children differing in developmental status in mainstreamed settings remain reasonable expectations. Should these findings be replicated with more diverse subject samples (i.e., children differing in terms of gender, ethnicity, or socioeconomic status) in a variety of settings, future work should be devoted to developing strategies that build upon these naturally occurring and rapidly emerging positive interaction patterns in order to maximize the peer-related social competence of children with and without developmental delays.

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