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The Peer Relations of Preschool Children with Communication Disorders

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GURALNICK, MICHAEL J.; CONNOR, ROBERT T.; HAMMOND, MARY A.; GOTTMAN, JOHN M.; and KINNISH, KELLY. *The Peer Relations of Preschool Children with Communication Disorders*. CHILD DEVELOPMENT, 1996, 67, 471-489. The peer-related social interactions of preschool-age children with communication disorders were compared to those of normally developing chronological age-mates. All children were previously unacquainted with one another and participated in a series of short-term play groups. Differences between the 2 groups emerged primarily in terms of overall social activity, as children with communication disorders engaged in fewer positive social interactions and conversed with peers less often during non-play activities. Children with communication disorders also were less successful in their social bids and appeared to be less directive with their peers. However, both groups of children exhibited similar patterns of socially competent interactions including the ability to sustain play (group play), to minimize conflict, to join others in ongoing activities, and to respond appropriately to the social bids of others. Based on peer sociometric ratings, both groups of children were equally accepted. These general patterns of similarities and differences were found in settings in which play groups consisted of all children with communication disorders (specialized settings) as well as in settings in which the play groups included both children with communication disorders and normally developing children (mainstreamed settings). However, even during the relatively brief acquaintanceship process, an analysis of peer preference patterns revealed that children with communication disorders in mainstreamed settings were less socially integrated in the play groups than normally developing children. The potential for additional difficulties in peer interactions for children with communication disorders when children become more familiar with one another and play becomes more intricate was discussed in light of interaction patterns formed during the short-term play groups.

Research examining the peer relations of young children has carefully documented its developmental course, provided insight into those historical and contemporary factors that govern the level of children's peer-related social competence, and identified many of the mechanisms through which peer relations uniquely contribute to a child's development (Hartup, 1983; Howes, 1988; Rubin & Coplan, 1992). These studies also have revealed the complexity of the issues confronting young children seeking to establish productive and successful relationships with their peers. In particular, social behaviors have been identified that are required for children to enter into the ongoing play activities of peers (Putallaz, 1983; Putallaz & Wasserman, 1990), to resolve the many conflicts that arise (Eisenberg & Gar-

vey, 1981; Hartup, Laursen, Stewart, & Eastonson, 1988; Shantz, 1987), and to manage the ebb and flow of social exchanges needed to maintain play (Gottman, 1983). Accordingly, it is not surprising that as many as 10% of children without any other known risk factors have problems establishing relationships with peers and forming friendships (Asher, 1990).

As might be expected, for children at risk for developmental problems and those with established disabilities (Guralnick, 1986), difficulties in peer relations are far more prevalent, even when controlling for developmental level. For example, in comparison to normally developing children at similar developmental levels, children with general developmental (cognitive) delays

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exhibit a marked absence of sustained interactions (social participation in group play), engage in disproportionately high levels of solitary play, are less preferred playmates based on peer sociometric ratings and observational measures, have fewer reciprocal friendships, become less successful in obtaining positive outcomes to social bids over time, and appear to be less interested in social play with peers (Guralnick & Groom, 1985, 1987, 1988). Moreover, these children display a pattern of individual social behaviors that is correlated with lower levels of peer-related social competence (Doyle, Connolly, & Rivest, 1980; Wright, 1980), such as reduced frequencies of attempts to direct peers during play, to use others as resources, or to show affection (Guralnick & Groom, 1985, 1987). Social participation difficulties, particularly as indicated by less involvement in sustained group play, are also apparent for children with hearing impairments (Higgenbotham & Baker, 1981), although the pattern of individual social behaviors differs from that of children with cognitive delays (Vandell & George, 1981). In fact, recent research is beginning to identify characteristic patterns of social participation with peers and individual social behaviors for various disability groups (see Odom, McConnell, & McEvoy, 1992).

Nevertheless, relatively few studies have examined the peer relations of young children with communication disorders, despite its high prevalence (Enderby, 1989). This is a highly diverse population, as difficulties can be identified at phonologic, morphologic, syntactic, semantic, pragmatic, or discourse levels of speech and language development (Johnston, 1988). Because developmental problems at any one or more of these levels can affect the comprehension or expression of language (Allen, 1989), problems in peer-related social competence can be expected (Guralnick, 1992). Even for normally developing children interacting with their peers, poor intelligibility and lack of grammatical clarity are important predictors of communication failure (Mueller, 1972), comprehension or encoding difficulties can lead to problems in identifying appropriate social cues (Dodge, Pettit, McClaskey, & Brown, 1986), and concerns regarding discourse can adversely affect the connectedness of exchanges so necessary for effective peer interactions (Black & Hazen, 1990).

The limited research available that has included samples of children defined as

communication disordered suggests the existence of peer interaction problems. Specifically, compared to chronological age-mates in group settings, children with communication disorders interact more with adults than peers, tend to be ignored more often by peers, and are less likely to respond to the initiations of others (Hadley & Rice, 1991; Rice, Sell, & Hadley, 1991). Yet we have few details regarding the extent to which these children participate socially with their peers (as reflected by measures of group, solitary, or parallel play), engage in dramatic or other forms of cognitive play, or actively converse with peers when not playing. Perhaps more importantly, virtually no information is available with respect to those individual social behaviors that characterize interactions with peers. Assertive type interactions, such as leading others, defending property, and joining children in specific activities (peer group entry), serve as important indicators of peer-related social competence and may be a special area of concern for children with communication disorders (Craig & Washington, 1993; Siegel, Cunningham, & van der Spuy, 1985; but see Fey & Leonard, 1984). Similarly, the degree to which children with communication disorders are successful in gaining appropriate responses to their social bids or engage in negative or rejecting exchanges, including hostility, failing to respond to others' social bids, or using directives in a negative manner, constitute important yet unknown patterns of social interactions that are relevant to peer-related social competence. Accordingly, in this investigation, a wide range of social participation and individual social behavior measures are used to examine and compare the peer interactions of children who are normally developing and children with communication disorders.

The extent to which peer interaction patterns are affected by the social setting constitutes an additional yet largely unexplored area. Children's sensitivity to the developmental characteristics of their peers, as indexed by chronological age, developmental level, or developmental status, has been well established. In terms of specific social/communicative exchanges, normally developing children appropriately adjust their interactions to the developmental characteristics of their peers (Masur, 1978; Shatz & Gelman, 1973), as do children with developmental delays (Guralnick & Paul-Brown, 1989). Similar adjustments have been ob-

served for children with communication disorders in dyadic exchanges (Fey & Leonard, 1984; Fey, Leonard, & Wilcox, 1981).

From the broader perspective of social interactions occurring in settings differing in terms of the developmental characteristics of the peer group, for normally developing children the impact of children's chronological age has been equivocal (Bailey, McWilliam, Ware, & Burchinal, 1993; Goldman, 1981). No consistent effects on peer interactions have been detected for normally developing children if children with developmental delays (the disability group found in most studies) are included in the peer group (see Buysse & Bailey, 1993, and Guralnick, 1990, for reviews). However, for children with a variety of disabilities, particularly those with developmental (cognitive) delays, rates of social interaction have been found to be higher in settings including normally developing children than in settings consisting only of other children with similar delays (e.g., Field, Roseman, DeStefano, & Koewler, 1981). Whether corresponding effects of social setting will be obtained when children with communication disorders are participants, which aspects of peer relations may be affected, and the degree to which children with communication disorders become integrated into the play activities of normally developing children are important questions that have not yet been addressed and will be examined in this investigation.

A better understanding of the peer relations of children with communication disorders and the effects of social setting are relevant to important contemporary clinical and practice issues as well. First, knowledge of peer interaction patterns for specific groups of children with established disabilities can be useful in focusing assessments of peer relations and for providing an initial framework to guide interventions (Guralnick, 1992). Second, the effects of setting can inform discussions and practices regarding the value of placing children with disabilities in preschool programs primarily containing normally developing children (referred to as mainstreaming or inclusion). The practice of early childhood mainstreaming is encouraged by federal law (IDEA, 1991). Nevertheless, the impact of mainstreamed settings compared to those containing only children with disabilities (specialized settings) on children's peer relations figures prominently in debates as to what constitutes the best

developmental/educational environment for young children and is central to the concerns of parents as well (Guralnick, 1990, 1994).

Method

Overview and Play Group Methodology

Previously unacquainted groups of children were brought together to form a series of 12 separate play groups ($N = 6$ children per play group). The play groups differed in terms of two factors: (1) the developmental characteristics of the children (referred to as the group variable), that is, children with communication disorders or normally developing children; and (2) the social environment (referred to as the setting variable), that is, play groups consisting only of other children with similar developmental characteristics (all normally developing children or all children with communication disorders) or those in which children from both groups participated. As noted, play groups consisting of children with similar developmental characteristics are referred to as specialized, whereas those settings containing children differing in developmental characteristics are referred to as mainstreamed.

Of the 12 play groups, six were specialized, three consisting of only normally developing children and three consisting of only children with communication disorders. The remaining six play groups were mainstreamed, each consisting of four normally developing children and two children with communication disorders. As described below, a matching procedure ensured that normally developing children assigned to mainstreamed or specialized groups, as well as children with communication disorders assigned to mainstreamed or specialized groups, were equivalent within each of the two groups in terms of child characteristic measures (chronological age, cognitive, language, adaptive behavior, and behavior problems). A similar matching process ensured equivalence across all groups for family demographic measures (family social status, marital status). During each 2-week play group, the social and play interactions of each child were recorded during a designated free-play period. At the conclusion of each play group, peer sociometric ratings were completed for each of the six children.

The play group methodology used in this study is similar to that described by Coie and Kupersmidt (1983) and Dodge (1983) involving normally developing chil-

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dren varying in social status, and to the work of Guralnick and Groom (1987), who established a series of mainstreamed play groups involving children with cognitive delays. In all of these studies, expected developmental patterns emerged even in the context of short-term play groups. In addition, the play group methodology has a number of characteristics uniquely suited to the study of emerging social interaction patterns. First, children unacquainted with one another can be brought together to form play groups, 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, Wagner, & Butler, 1990). Second, control over subject selection and the ability to achieve appropriate matches of family and child characteristics in the formation of the play groups minimize sampling bias inherent in the study of intact groups of mainstreamed or specialized children. Finally, the laboratory playroom housing play groups permits the use of sophisticated recording techniques and the application of multiple coding systems.

Subjects

Normally developing children were recruited through direct contact with administrators and teachers of public and private nursery schools and day-care programs. Children with communication disorders were recruited from appropriate service programs and from rosters of children who received clinical evaluations for communication disorders from diagnostic clinics. The chronological age range for all subjects was established at 4 years 3 months to 5 years 6 months. Because the preponderance of children with diagnosed communication disorders are male, only boys were selected to participate in the play groups. 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: (1) three siblings within 3 years of age of the child being considered, (2) teacher reports of major disruptive behavior problems, (3) legally blind or major uncorrected hearing loss, (4) significant motor problems, (5) acquainted with other children in the play group, and (6) living with the primary caregiver less than 1 year.

For selection and matching purposes, all prospective children were administered individually the revised version of the Wechsler Preschool and Primary Scale of In-

telligence (WPPSI-R; Wechsler, 1989). 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 (TACL-R; Carrow-Woolfolk, 1985) was administered. The TACL-R consists of scales for word classes and relations, grammatical morphemes, and elaborated sentences. A total score (standard score) also is obtained. Second, to supplement the receptive language assessment of the TACL-R, the expressive components of the Preschool Language Scale were administered (Zimmerman, Steiner, & Pond, 1979). Because of the lack of standardization, only raw scores were used (range 0–48 for verbal ability and 0–23 for articulation).

In addition to cognitive and language measures, mothers served as respondents for assessments of their child's adaptive behavior and behavior problems. First, the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Cicchetti, 1984) Survey Form was administered to mothers by trained interviewers. 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 obtained from the Child Behavior Checklist (CBCL; 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 8–66).

Beyond the inclusionary and exclusionary criteria applied to all subjects noted above, specific criteria were established for each of the two groups of children differing in developmental characteristics. Specifically, normally developing children were included if they achieved an FSIQ score between 90 and 130. Children were excluded, however, for any of the following reasons: (1) VIQ or PIQ lower than 90, (2) TACL-R less than 90, (3) CBCL Total Problem score

greater than the ninetieth percentile, (4) enrolled in a preschool program in which more than 15% of the children have established disabilities, or (5) has a sibling with an established disability.

For children with communication disorders, the selection criteria were more complex. To be included, a child must have achieved a PIQ equal to or greater than 90 or an FSIQ greater than 85, and have completed a comprehensive speech, language, and hearing assessment administered by qualified personnel resulting in a categorical diagnosis of a communication disorder and a recommendation for regular therapy. In addition, as a minimal protection against possible diagnostic errors, particularly in view of the wide variability in testing procedures found in the community, and to define more carefully the study population to be included in the sample, children with communication disorders were required to meet one or more of the following criteria: (1) a $PIQ > VIQ$ differential on the WPPSI-R of at least 15 points, (2) a TACL-R total score equal to or less than 90, or (3) a diagnosed articulation disorder. Children were excluded if they obtained a TACL-R score less than 55, a CBCL Total Problem score greater than the ninety-eighth percentile, held a primary diagnosis of stuttering, or had an unpaired cleft palate.

The criteria met by the 30 children with communication disorders who participated in the specialized and mainstreamed play groups were as follows: (1) articulation disorder only ($N = 6$); (2) $PIQ-VIQ$ differential greater than or equal to 15 points only ($N = 11$); (3) TACL-R equal to or less than 90 only ($N = 4$); and (4) children with both a $PIQ-VIQ$ differential and low TACL-R score ($N = 9$). In addition, comparisons among children with high and low receptive language scores (based on a TACL-R score of 90 as the cut-off point) and high and low expressive language scores (based on the PLS, median split with a cut-off score of 25) revealed an even distribution of children with receptive only, expressive only, and both receptive and expressive deficits.

The rationale for this complex series of criteria for selecting children with communication disorders reflects the general lack of agreement in the field for identifying research subjects (McCauley & Demetras, 1990), and the fact that it was not possible nor appropriate for the research staff to administer a complete diagnostic battery. As

noted, all children were required to have received a categorical diagnosis of a communication disorder and be recommended for regular therapy by qualified specialists. With regard to our additional criteria, it is important to point out that the TACL (now revised) is the most frequently used standardized test for selecting children with language impairments (McCauley & Demetras, 1990). Moreover, although it is recognized that the $PIQ > VIQ$ differential is not sufficient to guarantee the existence of a communication disorder, it is nevertheless characteristic of children so diagnosed (Stark & Tallal, 1981).

Matching Procedures

Children with communication disorders were first identified for each play group, with normally 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 play groups were formed when an appropriate number of children meeting criteria were recruited. Specialized and mainstreamed play groups 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 indicated in Table 1, as a result of this process, all child characteristic measures were equivalent for the normally developing children participating in the mainstreamed and specialized play groups ($p > .05$). Similar equivalencies were obtained for the children with communication disorders participating in specialized and mainstreamed settings. To further ensure an appropriate match between children with communication disorders participating in mainstreamed and specialized settings, similar proportions were maintained for children selected on the basis of the $PIQ > VIQ$ differential, the low TACL-R Full Scale score (<90), and a diagnosis of articulation disorder. As noted, only a small number of children received a diagnosis of articulation disorder only.

As expected, significant differences were obtained for most of the child characteristic measures (see Table 1 for details) when comparing normally developing children and children with communication disorders. The only exceptions were child's

TABLE 1

CHILD CHARACTERISTIC MEASURES FOR NORMALLY DEVELOPING CHILDREN AND CHILDREN WITH COMMUNICATION DISORDERS IN SPECIALIZED AND MAINSTREAMED SETTINGS

CHILD CHARACTERISTICS	NORMALLY DEVELOPING						COMMUNICATION DISORDERED					
	Specialized (N = 18)			Mainstreamed (N = 24)			Specialized (N = 18)			Mainstreamed (N = 12)		
	M	SD		M	SD		M	SD		M	SD	
Chronological age (months)	56.28	(3.51)		57.63	(3.80)		58.50	(5.14)		57.00	(4.94)	
WPPSI-R:												
Full-Scale IQ ^a	110.06	(10.88)		111.83	(8.47)		95.78	(12.35)		95.17	(10.11)	
Performance IQ ^a	110.83	(13.01)		113.75	(13.36)		103.94	(14.38)		106.00	(10.00)	
Verbal IQ ^a	107.39	(12.19)		107.83	(8.00)		89.39	(9.82)		87.00	(14.22)	
Performance-Verbal IQ ^a	3.44	(16.83)		5.92	(16.18)		14.56	(10.77)		19.00	(16.62)	
Full-Scale MA ^a	61.51	(7.18)		62.82	(6.41)		54.58	(6.74)		52.63	(4.74)	
Performance MA ^a	61.93	(8.19)		63.92	(8.98)		59.24	(7.84)		58.69	(5.97)	
Verbal MA ^a	60.03	(7.84)		60.57	(5.98)		51.00	(5.76)		48.20	(7.09)	
TACL-R:												
Total Scale ^a	105.06	(7.05)		104.13	(9.44)		93.83	(9.50)		90.00	(12.56)	
Word Class and Relations ^a	106.33	(9.25)		106.13	(11.46)		94.78	(14.94)		94.00	(9.92)	
Grammatical Morphemes ^a	103.06	(9.73)		102.63	(11.62)		91.11	(11.98)		89.25	(15.05)	
Elaborated Sentences ^a	105.06	(13.48)		104.88	(11.26)		100.00	(12.56)		92.33	(12.94)	
PLS:												
Verbal Ability ^a	35.83	(4.97)		37.42	(4.57)		26.83	(5.58)		23.50	(7.57)	
Articulation ^a	19.83	(2.29)		21.75	(3.24)		13.11	(4.01)		13.75	(3.45)	
Vineland:												
Total Adaptive Behavior ^a	97.56	(11.12)		97.83	(9.63)		87.28	(13.38)		82.67	(10.98)	
Communication ^a	96.00	(9.76)		97.21	(6.98)		83.06	(8.03)		80.42	(8.40)	
Daily Living Skills ^a	97.61	(11.06)		95.67	(11.60)		88.28	(13.80)		86.00	(12.77)	
Socialization ^a	99.39	(8.53)		100.75	(10.27)		95.22	(11.24)		93.67	(14.58)	
Motor Skills ^a	100.83	(9.65)		101.13	(10.31)		95.44	(16.73)		87.17	(10.65)	
CBCL:												
Total Behavior Problems ^a	46.61	(7.82)		47.75	(7.88)		55.06	(9.03)		50.83	(8.72)	
Externalizing	48.61	(8.42)		49.00	(8.65)		52.00	(9.42)		50.50	(8.30)	
Internalizing	46.00	(9.31)		47.21	(8.23)		54.06	(6.91)		52.75	(8.39)	

NOTE.—Standard deviations are in parentheses. WPPSI-R = Wechsler Preschool and Primary Scale of Intelligence; VIQ = verbal IQ; PIQ = performance IQ; FSIQ = Full-Scale IQ; TACL-R = Test of Auditory Comprehension—Revised; PLS = Preschool Language Scale; VABS = Vineland Adaptive Behavior Scales; CBCL = Child Behavior Checklist.

^a Indicates a significant difference ($p < .05$) between normally developing children and children with communication disorders.

chronological age and CBCL externalizing factor. Finally, for family demographics, 83% of the mothers were partnered with an average Hollingshead index of 2.18 (medium business, minor professional). The four groups did not differ for these measures ($p > .05$).

Play Group Setting and Procedure

Each six-child play group operated 2½ 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 play group. Parents were paid \$100 plus transportation expenses.

Play groups 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-min free-play periods, children had access to the extensive array of toys and equipment found in the playroom. 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 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.

Using split-screen technology, children's social and play interactions were video-recorded by 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 light-weight 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 min during free play over the 2-week period. Recording commenced on the second play group day and was divided into segments of 10 consecutive min for each of six recording periods per child. The order of recording children was randomized within blocks of six 10-min segments, and no child was ob-

served 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 below, 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. At the completion of the study, a peer sociometric measure was administered to each child.

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 developmental changes over time (Barnes, 1971; Rubin & Krasnor, 1980; Rubin, Watson, & Jambor, 1978; Smith, 1978), to socioeconomic status (Rubin et al., 1976), to environmental conditions (Vandenberg, 1981), to the familiarity of peers (Doyle et al., 1980), and to 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; 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-sec intervals. Coders recorded the categories of social participation and level of cognitive play (where required) during each 10-sec 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 three were derived from Parten's (1932) social participation categories consisting of the following play classifications:

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(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 three 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 pre-arranged rules). If any 10-sec interval was coded as either solitary, parallel, or group play, then one of the four cognitive play categories was also scored.

The seven 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 regarding with whom the focal child interacted, the identity of the peer for group, parallel play, active conversation, and onlooker categories was noted 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 below) 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 Doyle et al. (1980) and to Guralnick and Groom (1985, 1987). The cluster of individual social behaviors originally described by White and Watts (1973), including the ability to gain the attention of peers, to use peers as resources, to express affection, and to direct peers successfully during play, has been em-

ployed 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 correlate positively with social participation (Conolly & 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: (1) seeks attention of peer, (2) uses peer as a resource, (3) leads in peer activities—direct, positive or neutral, (4) leads in peer activities—indirect, positive or neutral, (5) leads in peer activities—direct, negative, (6) leads in peer activities—indirect, negative, (7) imitates a peer, (8) involved observation of peer, (9) joins peer(s) in specific activity, (10) verbally supports peer's statement, (11) verbally competes with peer, (12) shows pride in product to peer, (13) competes with peer for adult's attention, (14) expresses affection to peer, (15) shows empathy toward peer, (16) expresses hostility toward peer, (17) takes unoffered object, (18) defends property, and (19) seeks agreement from peer.

With the exception of the involved observation and defends property categories, each of the focal child individual social behaviors listed above 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 three 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 (four categories tied to direct/indirect and positive, neutral/negative dimensions), failing to follow the lead of a peer (four categories as above), responding and failing to respond to a peer's attempt to use the focal child as a resource (two categories), responding and failing to respond to a peer's attention seeking behavior (two categories), and responding and failing to respond when a peer sought agreement from the focal child (two 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 (1–6, 13, 17–19) 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 sec, 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 above 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-sec 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 below) within the event-based system.

Peer sociometric ratings.—Following Asher, Singleton, Tinsley, and Hymel (1979), at the end of the play group each child was individually presented with color Polaroid photographs of each play group participant and asked 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 average rating. In addition, separate scores were obtained for the number of positive assignments, the number of neutral assignments, and the number of negative assignments.

Reliability.—Prior to coding, raters were trained for a period of 12–19 weeks on the two observation scales. Videotapes of pilot play groups 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-min segments from a reliability tape (containing complex segments) for each of the two scales. Reliability also

was obtained during the course of the study for 25% of the play group 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 percent agreement obtained across each of the 10-sec observation intervals (number of agreements divided by the total number of observations and transformed to a percentage). Cohen’s (1960) kappa was calculated where appropriate. For prestudy reliability, raters agreed on a mean of 84% (range 83%–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, interobserver agreement averaged 94% (range 93%–96%) for the four cognitive play categories. Average agreement with regard to the identity of the peer involved in the social interaction was 85% (range 80%–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, 85% (range 82%–91%), $\kappa = .81$ (range .75–.87); cognitive play, 91% (range 87%–97%); and the identity of the peer, 89% (range 85%–95%).

For the individual social behavior scale, raters were considered to be in agreement if codes matched within a specified 10-sec 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. Percent 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. Calculated in this manner, the average prestudy agreement for this scale was 85% (range 84%–87%), $\kappa = .75$. Given agreement on the occurrence of a particular social interaction, observers further agreed on an average of 82% (range 80%–90%) of the occasions as to whether the event could be classified as successful or unsuccessful, an average of 79% (range 67%–88%) as to whether or not selected focal child behaviors were initiations, and an average of 98% (range 97%–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, 85% (range 83%–88%), $\kappa = .78$ (range .75–.82); successful/unsuccessful, 89% (range 84%–92%); initiations, 86% (range 64%–100%); and identity of peer, 95% (range 91%–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 (communication disorder [CD], normally developing [ND]) \times setting (mainstreamed, specialized) \times time (time 1, time 2) mixed-model analyses of variance (ANOVA) were 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 mainstreamed settings, analyses consisted of 2 (group) \times 2 (time) \times 2 (peer group; CD, ND) ANOVAs, with time and peer group as within factors. In those instances in which multivariate analyses of variance (MANOVA) were applied, Wilks's criterion was used. Whenever frequency data were transformed to proportions, the arcsine transformation was applied. However, to facilitate the interpretation of results, data presented in the tables and text are untransformed scores.

Effects of Group, Setting, and Time

Social participation.—A MANOVA carried out on the 10 social participation categories revealed significant multivariate effects for the setting, $F(10, 59) = 3.09, p < .01$, and group, $F(10, 59) = 2.73, p < .01$, factors. For setting, separate univariate effects were obtained for exploration, $F(1, 68) = 5.49, p < .05$, and transition, $F(1, 68) = 22.41, p < .001$ (see Table 2). Both social participation categories occurred more frequently in mainstreamed than in specialized programs. Two univariate effects also were obtained for the group factor. Specifically, ND children engaged in more active conversation than did CD children, $F(1, 68) = 5.69, p < .05$, but CD children participated in more transition type activities than did ND children, $F(1, 68) = 16.38, p < .001$. Separate analyses of the cognitive play categories revealed that when children were playing, they engaged primarily in dramatic and constructive activities, but that cognitive play did not differ for setting, group, or time ($p > .05$). Moreover, separate ANOVAs carried out on the fre-

quencies of the three cognitive play categories that were observed (functional, constructive, and dramatic) as nested with the three social participation categories (group, parallel, and solitary) also did not yield significant effects for any variable ($p > .05$).

Individual social behaviors.—A MANOVA carried out on the frequency of the 15 most commonly occurring individual social behaviors was designed to determine if specific patterns such as assertive or directive type interactions differed as a consequence of group, setting, or time. No significant multivariate effects were obtained ($p > .05$). However, inspection of the data suggested trends for the group variable. Specifically, univariate analyses were significant for the lead peer indirect, positive or neutral (M [ND] = 13.50; M [CD] = 7.97), $F(1, 68) = 9.25, p < .01$, and follows lead of peer indirect, positive or neutral (M [ND] = 6.21; M [CD] = 4.07), $F(1, 68) = 4.46, p < .05$, measures.

As was the case for the social participation and cognitive play scale, the individual social behaviors of the normally developing children and of children with communication disorders were highly similar in both the specialized and mainstreamed settings. The only trend observed, as indicated by a significant univariate effect, was for fails to follow lead of peer direct, positive or neutral, $F(1, 68) = 4.29, p < .05$, which occurred more often in specialized than in mainstreamed settings. However, considerable variability characterized both groups of children, and many of the behaviors occurred at low rates.

In order to evaluate the affective quality of the interactions, a "negative behavior composite" was identified from among all of the 34 individual social behaviors. Those behaviors included in the composite 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 composite." Separate ANOVAs for the two composite scores revealed a significant effect for the group factor for positive social behavior only, $F(1, 68)$

TABLE 2
 MEAN FREQUENCIES FOR SOCIAL PARTICIPATION AND COGNITIVE PLAY MEASURES FOR
 NORMALLY DEVELOPING AND COMMUNICATION DISORDERED CHILDREN IN SPECIALIZED AND
 MAINSTREAMED PLAYGROUPS

SOCIAL PARTICIPATION AND COGNITIVE PLAY	NORMALLY DEVELOPING				COMMUNICATION DISORDERED			
	Specialized (N = 18)		Mainstreamed (N = 24)		Specialized (N = 18)		Mainstreamed (N = 12)	
	M	SD	M	SD	M	SD	M	SD
Social participation: ^a								
Play:								
Group	48.72	(36.24)	39.92	(20.33)	46.17	(39.22)	39.33	(37.11)
Parallel	74.17	(23.99)	80.79	(31.29)	94.83	(36.56)	60.25	(24.53)
Solitary	134.50	(53.91)	132.33	(37.65)	135.44	(57.59)	151.75	(52.99)
Nonplay:								
Reading	3.28	(5.73)	6.79	(15.32)	5.83	(15.72)	5.42	(11.36)
Exploration .....	.39	(1.04)	.96	(1.49)	.39	(.85)	1.17	(1.11)
Active conversa- tion	32.56	(17.09)	31.46	(13.04)	22.67	(14.68)	24.17	(14.81)
Transition	10.94	(4.92)	14.29	(7.79)	13.17	(7.14)	25.33	(6.18)
Onlooker	29.61	(17.39)	30.96	(21.42)	22.83	(16.37)	32.08	(23.39)
Unoccupied	18.44	(20.40)	14.63	(12.84)	11.11	(10.23)	12.50	(12.54)
Adult directed	4.00	(4.93)	5.17	(4.44)	5.67	(5.90)	5.67	(5.35)
Cognitive play:								
Dramatic	40.42	(18.40)	39.32	(18.95)	42.21	(21.63)	41.06	(15.70)
Constructive	55.00	(17.68)	56.18	(17.56)	55.38	(21.64)	54.60	(14.95)
Functional	4.58	(5.47)	4.50	(4.06)	2.34	(2.89)	4.34	(5.22)

NOTE.—Standard deviations are in parentheses; data are summed across six observations; cognitive play categories are in percentages.

^a Significant setting effects were obtained for exploration and transition. Active conversation and transition were significant for the group factor.

= 5.92, $p < .05$. Specifically, normally developing children engaged in significantly more positive social interactions ($M = 117.31$) than did children with communication disorders ($M = 95.67$). This result is similar to the finding for the active conversation measure of the social participation scale, suggesting that normally developing children exhibit a higher level of social interaction or social activity than do children with communication disorders. When the percentage of social interactions that were negative was entered into an ANOVA (approximately one-third of total interactions), no significant effects were obtained ($p > .05$).

A separate ANOVA carried out on the percentage of success across all social bids (both positive and negative) also revealed a group effect, as normally developing children were more successful ($M = 55\%$) than children with communication disorders ($M = 49\%$), $F(1, 68) = 7.78$, $p < .01$. No other significant effects were obtained. A similar analysis for the percentage of indi-

vidual social behaviors initiated did not yield any significant effects ($p > .05$).

Peer sociometric ratings.—The final set of measures for the group \times setting analyses (no time factor) was obtained from the peer sociometric ratings. A significant MANOVA for setting was obtained, $F(3, 66) = 3.91$, $p < .05$, for the array of measures consisting of the average rating, the number of positive ratings, and the number of negative ratings. Univariate analyses revealed a significant effect only for the number of positive ratings, $F(1, 68) = 6.82$, $p < .05$, with more positive ratings being given by children in mainstreamed ($M = 3.22$) than specialized ($M = 2.36$) settings.

Factor analysis.—In order to identify possible patterns that existed within the larger data set, and to reduce the number of measures to correlate with demographic and child characteristics, a principal components factor analysis using the varimax rotation was carried out. Based on previous work (Guralnick & Groom, 1990) and outcomes

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from this study, the following nine measures were selected for entry: (1) total positive social behaviors, (2) proportion of negative social behaviors, (3) group play, (4) parallel play, (5) solitary composite (solitary, read, explore, unoccupied), (6) active conversation, (7) onlooker, (8) transition, and (9) positive peer sociometric ratings. This analysis yielded three factors accounting for 66.9% of the variance (see Table 3).

The first factor accounted for 32.4% of the variance and appeared to represent a *social competence* dimension, with high positive loadings on group play and positive peer sociometric ratings, but a negative loading on the solitary composite. Total positive social behaviors also had high positive loadings on this first factor, but a similar loading was obtained for the second factor as well. This second factor accounted for 20.5% of the variance and appeared to represent a *social interaction* dimension, with high positive loadings on total positive social interactions, active conversation, and onlooker. A high negative loading was obtained for the proportion of negative social behaviors, and a moderate negative loading for the solitary play composite. The third factor accounted for only 14.1% of the variance and appeared to reflect a *non-play* dimension. This was indicated by a high positive loading on the transition category and a high negative loading on parallel play. A moderate positive loading on solitary play also was obtained.

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 ANOVAs were then carried out for children's scores on each of the factors. No significant effects were obtained for the social competence fac-

tor ($p > .05$), although the social interaction factor did produce a significant group effect, $F(1, 68) = 4.01, p < .05$, with normally developing children receiving a higher factor score. The non-play factor yielded an interesting pattern with both a setting effect, $F(1, 68) = 20.14, p < .001$, and a group \times setting interaction, $F(1, 68) = 7.65, p < .01$. Follow-up analyses indicated that more non-play behavior occurred in the mainstreamed as compared to the specialized setting for the communication disordered children, although no differences were obtained for the normally developing children. However, this factor accounted for only a relatively small proportion of the variance.

Relationships with demographic and child characteristics.—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 normally developing children and children with communication disorders. The level of significance was set at .01 because of the large number of correlations. With this more stringent criterion, no significant correlations were obtained for any measure. Nevertheless, the only consistent trend ($p < .05$) observed was an association between chronological age and the social competence factor for both ND ($r = .36$) and CD ($r = .31$) groups.

In order to evaluate the possible differential effects produced by children with communication disorders selected because of articulation problems only ($N = 6$), an additional series of analyses were conducted. First, comparisons were made between the articulation-only subgroup and the remaining children with communication disorders on the social participation and cognitive

TABLE 3
ROTATED FACTOR MATRIX

Measure	Factor 1	Factor 2	Factor 3
Group play .....	.783	-.011	-.118
Positive peer sociometric ratings .....	.715	-.196	.320
Solitary play composite	-.729	-.435	.399
Onlooker	-.131	.800	.259
Proportion negative social behaviors .....	.035	-.685	-.184
Total positive social behaviors .....	.656	.614	-.210
Active conversation .....	.284	.558	-.274
Transition .....	.142	.120	.785
Parallel play .....	.276	-.087	-.764

play scales, as well as the individual social behavior scale. No significant differences were obtained ($p > .05$). Second, the entire set of analyses described above, excluding the articulation-only group, was repeated. Findings indicated only minor variations in comparison to results for the entire sample. Accordingly, there appear to be many pathways through which difficulties in communication can influence children's level of social interactions with their peers.

Peer Interactions in Mainstreamed Play Groups

The following set of analyses examined interactions occurring only within the mainstreamed setting. In order to determine whether the developmental status of a child's companion (CD or ND) affected the patterns of social interactions of children in the two groups, a separate independent variable referred to as peer group interacted with (peer group; either representing CD or ND children) was added. As noted, this variable identifying who children interacted with replaced the setting variable for analyses reported in this section.

Success of social bids and proportion initiated.—Focusing specifically on the proportion of social bids that were successful, a 2 (group; CD, ND) \times 2 (peer group; CD,

ND) \times 2 (time: 1, 2) ANOVA was carried out. This analysis yielded significant effects for group, $F(1, 34) = 12.45, p < .001$, peer group, $F(1, 34) = 4.69, p < .05$, and the group \times peer group interaction, $F(1, 34) = 4.90, p < .05$. Follow-up analyses revealed that, as expected from earlier analyses that considered both specialized and mainstreamed settings, normally developing children were more successful than children with communication disorders. However, the significant interaction revealed that although the normally developing group had a higher success rate than the communication disordered group irrespective of the peer group interacted with, the children with communication disorders were more successful when interacting with the normally developing peer group (see Fig. 1). Finally, no significant effects were obtained for the proportion of initiations ($p > .05$).

Social integration.—To assess the extent to which children with communication disorders were socially integrated in the mainstreamed settings, a preference technique developed by Guralnick and Groom (1987) was applied. 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

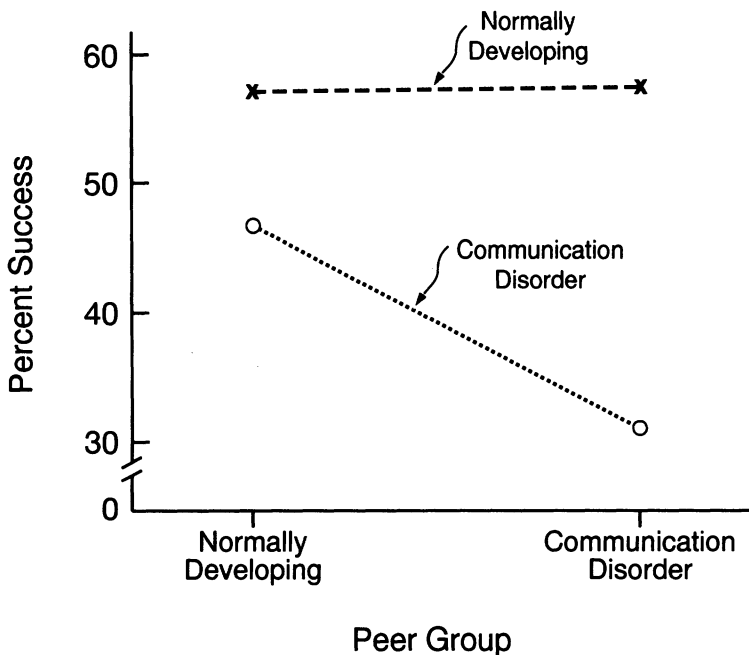


FIG. 1.—Percent success of social bids by children with communication disorders and normally developing children to the two peer groups.

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groups available for social interaction. To obtain different indices of social integration, four such preference scores were derived. 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 described earlier.

To obtain a preference score, the proportion of interactions *expected* to occur to each of the two peer groups was first determined for each child within a play group 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 child's preference score being determined was an ND child, and assuming no absences, the expected proportions associated with each of the peer groups would be .60 (3/5) to normally developing children and .40 (2/5) to children with communication disorders. Taking absences into account, the first three and second three play group sessions were averaged to yield 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; ND, CD) \times 2 (peer group interacted with; ND, CD) \times 2 (time; 1, 2) ANOVAs were 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 two indices based on social participation, a significant effect for peer group was obtained for the passive interaction composite only, $F(1, 34) = 8.09, p < .01$. Overall, ND peers were preferred to CD children during passive interactions. Although no differences were obtained for the negative individual social behavior category, a significant preference for ND children also was found for the total positive individual social behavior category, $F(1, 34) = 9.37, p < .01$. No other effects were significant ($p > .05$).

Discussion

Observations of the peer-related social interactions of children with communication disorders participating in a series of short-term play groups revealed a pattern of both similarities and differences in comparison to the peer interactions of normally developing chronological age-mates. Similarities were observed across the entire domain of peer relations, including sustained interactive play as indicated by the group play measure; interest in peers as reflected by the onlooker, parallel play, involved observation, and initiation measures; levels of conflict as suggested by the negative interaction composite; successful peer group entry as indicated by the joining peers who were engaged in specific activities measure; responsiveness to the social bids of peers as reflected by the responding to peers' efforts to direct their activities, to use them as resources, and to gain their attention or agreement measures; being actively involved with toys and materials as indicated by the rates of solitary play, parallel play, reading, and exploration; and acceptance by others in the play groups as indicated by peer sociometric ratings. Moreover, when playing, both groups either used materials in a constructive fashion ($M = 56\%$) or engaged in dramatic play ($M = 40\%$). Few instances of unoccupied behavior were observed.

Despite these similarities, a number of important differences also emerged between children with communication disorders and their normally developing chronological age-mates. As expected from previous work (Hadley & Rice, 1991), children with communication disorders engaged in fewer instances of active conversation, had a lower rate of positive social behaviors, and were

less successful in gaining an appropriate response to their social bids. Moreover, irrespective of setting, children with communication disorders in comparison to normally developing children tended to have a lower frequency both of indirect positive or neutral leads and following the indirect positive or neutral leads of peers. Finally, although acceptance as indexed by peer sociometrics did not differ between these groups, children with communication disorders in the mainstreamed settings nevertheless were less socially integrated, as reflected by observational indices of composite measures of passive and positive social interaction.

Taken together, the pattern of differences raises concerns regarding certain aspects of the peer relations of children with communication disorders. As indicated by the factor analysis, the dimension of peer relations that appears to be most affected is the overall level of "social interaction" with peers (i.e., children with high scores on this factor have high rates of positive social behavior and conversation, watch others frequently, but are less negative and tend not to play alone). Yet the factor analysis also indicated that, within the context and demands of these short-term play groups, children with communication disorders appear to be as "socially competent" as their normally developing peers (i.e., children with high scores on this factor actually succeed in engaging in sustained play and are well regarded by their peers). Consequently, this suggests the existence of adaptive capacities for children with communication disorders, at least for the short term, despite differences in various features of their peer relations.

However, it is quite possible that differences in the level of social competence during play between children with and without communication disorders may become apparent when play becomes more complex and demanding as children in the play groups become more familiar with one another (Doyle et al., 1980; Howes, 1988; Lederberg, Ryan, & Robbins, 1986). The general absence of time effects for any of the measures across the 2-week period indicates that complex group interaction patterns may not have had sufficient time to emerge in this study. Yet as complexity increases, the combination of less successful outcomes for their social bids, fewer positive social interactions overall, less participation in conversations that presumably include establishing plans for dramatic play themes, and the compre-

hension and expressive language difficulties that define the group of children with communication disorders are likely to eventually take their toll on the level of sustained play, the ability to join established groups, the skills needed to resolve conflicts, and related measures of peer-related social competence. Moreover, although children with communication disorders appear to be reasonably assertive as indexed by the proportion of initiations, should trends identified in this study related to a relative lack of directedness in peer interactions be found to be robust, characterizing a disproportionately large number of children with communication disorders, additional difficulties in peer relations can be expected (see Guralnick & Groom, 1985, 1987).

Having identified additional details of the patterns of similarities and differences between the peer interactions of young children with communication disorders and their normally developing chronological age-mates in this study, future research can now focus on determining those specific factors that contribute to these patterns. As noted, children's peer interactions can be affected by a diverse array of differences in communicative ability. Although the absence of cognitive (nonverbal) delays and emotional problems are among the criteria that define the population of children referred to as communication disordered, it is evident nevertheless that numerous developmental differences in comparison to normally developing chronological age-mates will remain even when established exclusionary criteria are used for selecting samples. In fact, as seen in our sample and those of others (e.g., Stark & Tallal, 1981), due to the co-occurrence of behavioral patterns and generally depressed scores even for performance measures, differences are certain to exist on many developmental dimensions beyond language, despite adherence to generally accepted selection criteria. Accordingly, in future work, one possible approach to determining which factors contribute to observed peer interaction patterns is to control systematically for specific developmental characteristics through the use of various comparison groups (e.g., based on performance IQ, receptive language, or mental age). However, beyond difficulties in actually finding the appropriate comparison groups, results from the current study indicate that this is not likely to be a fruitful approach. Specifically, developmental characteristics, including performance IQ and

receptive language, were not correlated with the social competence, social interaction, or non-play factors. Alternatively, recent theoretical and empirical approaches have emphasized that information processing, emotional regulation, and other processes can be directly linked to children's peer relations (Dodge, 1991; Guralnick, 1992; Rubin & Krasnor, 1986), approaches that would appear relevant to the interaction patterns observed in this study. Assessments of these and related processes that may be governing children's peer interactions may well be of considerable value in understanding the developmental patterns of peer relations for children with and without disabilities.

With respect to the comparisons between mainstreamed and specialized settings, despite differences in terms of positive sociometric ratings and the non-play factor, relationships with peers were similar in both settings. The finding that the presence of children with communication disorders did not affect the peer interactions of normally developing children is consistent with previous studies of mainstreaming involving heterogeneous groups of children with disabilities (e.g., Field et al., 1981; Miller et al., in press). However, the finding that the peer interactions of children with communication disorders were also unaffected by the developmental status of the children in their play groups is not consistent with related research. In general, small but consistently higher levels of peer interactions have been found to be associated with participation in mainstreamed rather than specialized programs for a wide range of children with established disabilities, even as a consequence of relatively brief experiences in mainstreamed programs (see Buysse & Bailey, 1993, and Guralnick, 1990, for reviews).

The absence of this effect for children with communication disorders participating in mainstreamed as opposed to specialized settings is surprising for a number of reasons. Specifically, the social interaction levels of the normally developing children, as reflected in the positive social behavior composite, the extent of active conversation, and the overall success of social bids, would suggest that the presence of normally developing children would make the mainstreamed setting a more socially interactive environment. Similarly, the high rate of success of children with communication disorders when interacting with normally developing children in the mainstreamed setting

and the fact that normally developing children were preferred play partners by both groups further suggest that a higher level of responsivity to social bids was characteristic of the mainstreamed in contrast to the specialized setting. Moreover, it is also reasonable to expect that, in the mainstreamed setting, more normally developing children would assume directive roles in play. One consequence of this direction might be greater involvement of all children in sustained or thematic play. In particular, as noted earlier, appropriate accommodations to the cognitive and linguistic levels of play partners have been shown to occur for normally developing children in relation to the chronological age or conversational responsiveness of other normally developing children (Masur, 1978; Shatz & Gelman, 1973), and to children with developmental (cognitive) delays (Guralnick & Paul-Brown, 1984). It is not known whether similar accommodations by normally developing children also occur to children with communication disorders. However, it is reasonable to anticipate at least minimal adjustments to result, thereby establishing the potential for facilitating involvement in sustained play of all play group participants. Nevertheless, as noted, despite these expectations the peer interactions of children with communication disorders did not vary in any meaningful way as a consequence of setting.

In view of these typically influential factors operating to enhance peer interactions, why did a setting effect fail to occur? One possibility is that many of the same processes described above associated with the mainstreamed setting were also operating in the specialized setting, at least in the short term. Specifically, the variability in peer relations for children with communication disorders was considerable, with many children demonstrating highly sophisticated interaction patterns. In fact, equal representation of children from both groups was found in the upper quartile of the social competence factor. It may well be, at least in the early stages of a play group containing only children with communication disorders, that the more sophisticated children are highly responsive and adopt directive roles similar to those suggested above for normally developing children. Although adjustments of social/communicative interactions to the cognitive and linguistic levels of their play partners may well prove to be more difficult for children with communication disorders, Fey and Leonard (1984) have

demonstrated that children with specific language impairments are at least capable of making these adjustments in accordance with partners differing in chronological age in essentially the same way as do normally developing same-age children. Accordingly, this pattern may have been sufficient to minimize or compensate for the effects of the generally less socially interactive and responsive specialized setting. The social separation of children with communication disorders found in the mainstreamed setting may also have contributed to mitigating any effects of a more interactive social setting, although separation was only found for two of the four measures and both groups preferred normally developing peers. Moreover, given these factors (e.g., the existence of social separation, relative skills in making linguistic adjustments, different levels of social interaction) and other potentially counterbalancing factors that influence children's peer relations in specialized and mainstreamed settings, future research will be needed to determine whether any differential effects of setting emerge when play becomes more demanding as a consequence of longer-term associations.

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