

ARTICLES

Nonsocial Play Patterns of Young Children With Communication Disorders: Implications for Behavioral Adaptation

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It has been well established that young children with communication disorders (CD) have considerable difficulties interacting socially with peers in free-play settings. The central purpose of this study was to determine whether behavioral adaptations of children with CD could contribute to their peer interaction problems. To accomplish this, the behavioral patterns of reticent, solitary–passive, and solitary–active subtypes of nonsocial play of children with CD were observed in unstructured playgroup settings and compared to the nonsocial play of matched groups of typically developing children. Also examined was whether the associations with peer social interaction measures and child and family characteristics differed among the reticent, solitary–passive, and solitary–active subtypes and whether the context factors of the developmental status and familiarity of peers influenced these patterns. Results revealed that preschool children with CD do not exhibit distinct patterns of nonsocial play and provide no evidence for situation-specific (i.e., with peers) behavioral adaptations despite difficulties interacting with peers. The developmental characteristics of or familiarity with one’s peers did not influence these results. Moreover, the peer social interaction patterns corresponding to each subtype, as well as child and family characteristics associated with each subtype, were also similar for both groups of

children. Recommendations for preventive intervention programs to minimize future peer interaction problems emphasizing social-information and emotional regulation processes were presented.

Young children identified as having communication disorders (CD) constitute a complex and heterogeneous group characterized by a range of deficits in speech and language but obtain scores at age-appropriate levels on tests of nonverbal intelligence (Catts, Fey, Tomblin, & Zhang, 2002; Kelly & Sally, 1999). Although professional consensus with respect to the specific forms these disorders can take and corresponding classification systems are not available, communication difficulties can nevertheless be identified at many levels including those of phonology, morphosyntax, semantics, pragmatics, and discourse (Kelly & Sally, 1999; Leonard, 1998; Tager-Flusberg & Cooper, 1999; Tallal & Benasich, 2002). Available evidence suggests that a substantial portion of children classified as CD during early childhood will also experience both academic and social difficulties over time (Fey, Catts, & Larrivee, 1995; Schachter, 1996).

Although often subtle, difficulties in the social interactions of children with CD can be detected during the preschool period, particularly when interacting with peers. In general, as evaluated during free-play interactions, in comparison to typically developing chronological age-mates, children with CD initiate less frequently, are ignored more often by peers, and are less responsive to the social bids of other children (Guralnick, Connor, Hammond, Gottman, & Kinnish, 1996; Hadley & Rice, 1991; Rice, Sell, & Hadley, 1991). Moreover, children with CD are usually less preferred play partners by their peers in group settings containing both typically developing children and those with CD (inclusive settings), have more difficulty establishing mutual friendships, and tend to interact with adults more often (Gertner, Rice, & Hadley, 1994; Guralnick et al., 1996; Rice et al., 1991). These peer interaction problems continue to be evident during the elementary school years (e.g., Brinton & Fujiki, 1999; Fujiki, Brinton, Morgan, & Hart, 1999; Fujiki, Brinton, & Todd, 1996).

Coexisting with these well-documented peer interaction difficulties are substantial abilities to interact with peers in a socially competent manner similar to typically developing chronological age-mates; that is, children with CD engage in sustained (group) play, minimize conflict, and join others in play to a similar extent (see Guralnick et al., 1996). Moreover, the amount of nonsocial play in which children with CD participate is also similar to that of typically developing children. Despite this complex and somewhat contradictory pattern of peer play, efforts have been made to search for factors that might lead to the identification of the characteristics of children with CD associated with greater or lesser risk for those peer interaction difficulties that are evident (e.g., fewer initiations, less responsive, less preferred).

One approach to understanding the peer social interaction problems of children with CD has been to focus on their cognitive and communicative characteristics, as difficulties in these domains are likely to adversely affect those social-information processing components that govern peer-related social competence. Difficulties attending to, encoding, or interpreting complex social information are prime candidates in this connection, as are concerns that many of these children simply cannot execute social strategies in an effective and timely way (Ford & Milosky, 2003; Guralnick, 1992, 1999; Rubin & Krasnor, 1986).

It is also the case that emotion or emotion regulation factors may contribute to the peer interaction problems of children with CD. That is, disruption of emotion or emotion regulation processes may generate nonoptimal patterns of social interactions in peer groups. Admittedly, definitional and conceptual issues for the constructs of emotion and emotion regulation are still being debated (Cole, Martin, & Dennis, 2004), and no attempt is made in this study to define and assess those constructs directly. Rather the focus of this study is on behavioral adaptations to possible emotional regulation problems generated in the peer context as a result of children's communication difficulties. These behavioral adaptations in the peer context, once established, may further contribute to peer interaction problems. For example, other clinical groups, such as children with developmental delays, often turn to solitary play as an emotion regulation strategy or behavioral adaptation to a failure to engage peers in social interactions (Wilson, 1999). If it persists, this behavior pattern can ultimately have negative consequences (see Rubin & Mills, 1988). Moreover, when teachers are respondents, children with CD are rated as having higher levels of behavioral problems, especially in connection with scales representing internalizing or social problem difficulties (Redmond & Rice, 1998). This could inhibit children from initiating to peers. Consequently, the potential for behavioral adaptations due to these and related circumstances exists, and is examined in this study through direct observations of children with CD engaging in play with peers.

One approach to understanding possible behavioral adaptations is to examine children's nonsocial play patterns during unstructured play with peers. For typically developing children, the analysis of nonsocial play (i.e., playing alone when in the presence of available peers) has been particularly fruitful in this connection. Recent research has clearly revealed that nonsocial play can be considered to be a multidimensional construct composed of distinct subtypes that correspond to different behavioral patterns, developmental pathways, and developmental outcomes (Coplan, 2000; Coplan, Rubin, Fox, Calkins, & Stewart, 1994; Harrist, Zaia, Bates, Dodge, & Pettit, 1997; Rubin, 1982; Rubin, Stewart, & Coplan, 1995). The general approach has been to define, a priori, subtypes based on a conceptual framework, operationalize each subtype, and then determine if the constructs can be considered to be distinct and that each corresponds to measures that yield coherent psychological meanings.

Three subtypes of nonsocial play behaviors have been put forward: (a) reticent behavior—a behavioral pattern consisting of a hesitancy to join peers or exhibiting no apparent purpose to one's behavior, (b) solitary–passive behavior—a behavioral pattern characterizing children who prefer to play alone but are quite capable of socially competent interactions when called on to do so, and (c) solitary–active behavior—a behavioral pattern in which children engage in abnormal forms of play such as repetitious sensorimotor types of behavior or engage in dramatic play action alone but when peers are available (Coplan et al., 1994). These three subtypes of nonsocial play have been operationalized using Rubin's (2000) Play Observation Scale (POS), as applied to observations of children participating with peers during free-play situations. Specifically, both social and nonsocial behaviors are coded across a series of consecutive intervals with respect to the major social participation categories of the POS (unoccupied, onlooking, solitary play, parallel play, conversation, and group play) as well as the quality of the play when it occurs (functional, exploratory, dramatic, constructive, games with rules). Reticent behavior is defined as intervals in the POS consisting of unoccupied or onlooking behavior; solitary–passive behavior is defined as intervals consisting of solitary–exploratory or solitary–constructive play; and solitary–active behavior is defined as intervals consisting of solitary–functional and solitary–dramatic play. Analyses of intercorrelation matrices for these three constructs have provided evidence for considering them as representing distinct subtypes of nonsocial play (Coplan et al., 1994; Guralnick, Hammond, & Connor, 2003).

With respect to the psychological meaning of these three subtypes of nonsocial play, a number of studies have examined expected associations with other child characteristics. Specifically, for reticent behavior, consistent with the observation that many of these children appear anxious in social situations, concurrent associations with temperamental shyness and internalizing problems have been reported (Coplan, 1998, 2000; Coplan et al., 1994; Coplan, Gavinski-Molina, Lagacé-Séguin, & Wichmann, 2001; Coplan & Rubin, 1998). Of note, teacher ratings of lower social competence are also associated with reticent behavior (Coplan, Gavinski-Molina, et al., 2001). These children appear to be interested in their peers but at the same time are fearful of those interactions, representing an approach–avoidance conflict (Asendorpf, 1990). Given the potential for increased emotion regulation difficulties discussed earlier, children with CD may be at greater risk of a reticent behavioral pattern in the peer situation. Such hesitancy may be associated with the lower level of success children with CD experience in having their social bids responded to and for other problematic patterns of peer interactions as well. This would certainly be consistent with behavior problem ratings by teachers suggesting elevated levels of internalizing problems (Redmond & Rice, 1998).

In contrast, children who engage in frequent episodes of solitary–passive behavior do not exhibit anxiety about peer interactions and are essentially well-regulated emotionally (Rubin, Coplan, Fox, & Calkins, 1995). Moreover, they attempt

to interact competently with peers when they choose to do so, although they prefer to be alone, exploring and playing constructively with objects (Coplan & Rubin, 1998; Coplan et al, 1994; Rubin, 1982). It should be noted that recent work suggests that solitary–passive behavior is associated with ratings of poorer academic ability and internalizing problems for boys but not girls, with similar trends for social competence (Coplan, Gavinski-Molina, et al., 2001) and possible problems emerging over time (Rubin & Mills, 1998). Nevertheless, the preponderance of evidence suggests that solitary–passive behavior should not be of concern during the early childhood period. Children with CD may adopt this behavioral pattern more frequently as a means of adapting to the stress of interacting with peers, despite an overall competence.

As noted, the third subtype of nonsocial play consists of a behavioral pattern of repetitive sensorimotor behaviors or dramatic play when playing alone, yet having easy access to peers. As might be expected, this behavioral pattern is associated with maladaptive behaviors during early childhood, particularly impulsivity and externalizing problems (Coplan & Rubin, 1998; Coplan et al., 1994; Rubin, 1982). Also as expected, teachers have rated children exhibiting this pattern as less socially competent compared to children who do not display any solitary–active behavior (Coplan, Wichmann, & Lagacé-Séguin, 2001). Presumably, these children are interested in interacting with their peers, but this unusual behavior pattern leads peers to reject and ignore them (see Rubin & Asendorpf, 1993). Although externalizing problems appear to be of limited concern for children with CD, the frequent co-occurrence of attentional difficulties and hyperactivity could result in an elevated risk for engaging in this solitary–active behavioral pattern (Tallal, Dukette, & Curtiss, 1989).

Accordingly, in this study we first determined whether one or more of the nonsocial play behaviors (subtypes) of children with CD, serving as indicators of behavioral adaptations in the challenging context of the peer play situation, differed from those of typically developing children. To accomplish this, the nonsocial play of matched groups of typically developing children and children with CD were compared as they participated in a series of 2-week playgroups with initially unfamiliar peers. As noted, in view of the language difficulties of children with CD, possible susceptibility internalizing problems, and their history of often difficult relationships with peers in unstructured play, higher levels of reticent behavior are to be expected for these children, although children with CD may channel these difficulties into increased participation in solitary–passive forms of play. Only minor differences in solitary–active behavior are anticipated as there is little evidence that children with CD exhibit externalizing behavior patterns.

Next, we addressed whether specific social behaviors with peers were associated with the three nonsocial play subtypes and whether this pattern of relationships was similar for children with CD and typically developing children. To examine these issues, a series of observational measures of social interactions with

peers occurring in the 2-week playgroups was included. These measures included the success of children's interactions with peers, their frequency of initiations, the frequency of positive and negative behaviors directed toward peers, the proportion of positive interactions, and the responsiveness of children to the positive social bids of their peers. Each of these six social interaction measures should be negatively related or unrelated to each of the three nonsocial play subtypes. However, some subtypes of nonsocial play may also produce different patterns of associations. Specifically, it would be expected that solitary-active behavior would be more closely linked with a lower proportion of positive behavior toward peers and lower levels of success, and that reticent behavior and perhaps even solitary-passive behavior would be associated with lower levels of initiations. Again, although the proportion of time children spent in one or more of the subtypes might differ between the two groups, assuming that each of the nonsocial play subtypes hold the same meaning, these patterns of correlations should not differ between typically developing children and children with CD. Moreover, although not expected to yield consistent patterns (see Gertner et al., 1994; Guralnick et al., 1996), associations with child characteristic measures of cognitive, language, and adaptive behavior were nevertheless included as well.

Other, but far less central questions regarding the influence of context were also addressed in this investigation. First, the possible influences of the developmental characteristics of play partners were considered. The peer interactions of children with CD have generally been evaluated within a setting that included typically developing children, referred to as inclusion or mainstreaming (e.g., Gertner et al., 1994). In those inclusive settings, children with CD interacting with one another are less successful in gaining a response to their social bids than when interacting with typically developing children, and children with CD are less preferred playmates (Gertner et al., 1994; Guralnick et al., 1996). This pattern of increased social-communicative failure and restricted access to play partners may alter the distributions of nonsocial play subtypes. Accordingly, to examine the possible effects of setting on nonsocial play subtypes, separate playgroups were arranged such that each of the two target groups differing in developmental status (CD, typical development) was compared when they participated in settings containing children who were similar (specialized setting) to settings with children different (inclusive setting) in developmental status.

Second, the familiarity of peers is an important influence on various aspects of children's peer relationships (Doyle, Connolly, & Rivest, 1980; Shea, 1981). This context factor is also relevant to nonsocial play (Coplan, 2000), although considerable short-term stability has been observed for each of the three subtypes of nonsocial play when patterns at the beginning and end of a play session with unfamiliar peers have been correlated with one another (Coplan et al., 1994). Longer-term stability has been observed as well (Coplan, 2000), despite adjustments that are likely to occur in response to the initially unfamiliar environment and playmates (Asendorpf, 1991). Investigated here is whether increas-

ing familiarity occurring in intensive short-term playgroups can influence nonsocial play patterns.

In summary, based on their peer interaction difficulties and related concerns, the primary purpose of this investigation was to determine if children with CD exhibit different distributions of participation in nonsocial play subtypes in comparison to a matched group of typically developing children. These nonsocial play behavior patterns in unstructured play settings with peers were intended to represent children's behavioral adaptations to possible emotion regulation difficulties and may contribute to children's peer interaction problems. To examine this further, associations with children's social behaviors with peers were obtained for these three nonsocial play subtypes for both developmental status groups. Possible correlations with child and family characteristics were evaluated as well. Finally, the effects of the context factors of inclusion and familiarity (short-term stability) on subtypes of nonsocial play were investigated.

METHOD

Overview

Previously unacquainted groups of children were brought together to form a series of 12 separate playgroups ($N=6$ children per playgroup), each operating for a 2-week period. Children participating in the playgroups differed in terms of their developmental characteristics—referred to as the developmental status variable (i.e., children with CD or typically developing children). The social environment of the playgroups also varied—referred to as the setting variable (i.e., playgroups consisting only of other children with similar developmental characteristics [specialized], or those in which children from both developmental status groups participated [inclusive]).

Of the 12 playgroups, 6 were specialized, in which 3 consisted of only typically developing children and 3 were composed of only children with CD. The remaining 6 playgroups were inclusive; each consisted of 4 typically developing children and 2 children with CD. As described later, a matching procedure ensured that typically developing children assigned to inclusive or specialized playgroups, as well as children with CD assigned to inclusive 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 (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.

Typically developing children were recruited through direct contact with administrators and teachers of public and private nursery schools and day care pro-

grams. Children with CD 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 participants 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 playgroups. Similarly, to avoid potential confounds due to race, only White 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) legally blind or major uncorrected hearing loss, (d) significant motor problems, (e) acquainted with other children in the playgroup, and (f) 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 Intelligence (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 (PLS) 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, 1991). 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 participants noted earlier, specific criteria were established for each of the two groups of chil-

dren differing in developmental characteristics. Specifically, typically developing children were included if they achieved a FSIQ score between 90 and 130. Children were excluded, however, for any of the following reasons: (a) VIQ or PIQ lower than 90, (b) TACL-R less than 90, (c) CBCL Total Problem score greater than the 90th percentile, (d) enrolled in a preschool program in which more than 15% of the children have established disabilities, or (e) has a sibling with an established disability.

For children with CD, the selection criteria were more complex. To be included a child must have achieved a PIQ equal to or greater than 90 or a 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 CD were required to meet one or more of the following criteria: (a) a $PIQ > VIQ$ differential on the WPPSI-R of at least 15 points, (b) a TACL-R total score equal to or less than 90, or (c) 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 98th percentile, held a primary diagnosis of stuttering, or had an unrepaired cleft palate.

The criteria met by the 30 children with CD who participated in the specialized and inclusive playgroups were as follows: (a) articulation disorder only ($N = 6$); (b) $PIQ - VIQ$ differential greater than or equal to 15 points only ($N = 11$). Although it is recognized that the $PIQ > VIQ$ differential is not sufficient to guarantee the existence of a communication disorder and cannot be used as the primary basis for diagnosis (McCauley, 2001), it is nevertheless often characteristic of children so diagnosed (Stark & Tallal, 1981; as noted, all children in this study received an independent diagnosis of a communication disorder and were receiving services); (c) TACL-R equal to or less than 90 only ($N = 4$); and (d) 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 cutoff point) and high and low expressive language scores (based on the PLS, median split with a cutoff score of 25) revealed an even distribution of children with receptive only, expressive only, and both receptive and expressive deficits.

Matching Procedures

Children with CD were first identified for each playgroup, with typically developing children participating in both inclusive and specialized groups subsequently recruited from the same neighborhoods to maximize similar demographic charac-

teristics. 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 inclusive 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 a result of this process, all child characteristic measures were equivalent for the typically developing children participating in the inclusive and specialized playgroups ($p > .05$). Similar equivalencies were obtained for the children with CD participating in specialized and inclusive settings. To further ensure an appropriate match between children with CD participating in inclusive 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 typically developing children and children with CD. The only exceptions were child's chronological age and CBCL externalizing factor. Finally, for family demographics, 83% of the mothers were partnered. The average Hollingshead Index was 2.18 (medium business, minor professional). The groups did not differ for these measures ($p > .05$).

Playgroup Setting and Procedure

Each six-child playgroup operated 2.5 hr 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-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.

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 as seen through a

TABLE 1
Child Characteristics for Each Developmental Status Group

Child Characteristics	Communication Disorder N = 30		Typically Developing N = 42	
	M	SD	M	SD
Chronological age (months)	57.90	5.03	57.05	3.70
WPPSI-R				
Full Scale IQ***	95.53	11.33	111.07	9.49
Performance IQ*	104.77	12.65	112.50	13.13
Verbal IQ***	88.43	11.60	107.64	9.88
Performance-Verbal IQ**	16.33	13.33	4.86	16.30
Full Scale MA***	53.80	6.01	62.26	6.70
Performance MA*	59.02	7.05	63.07	8.60
Verbal MA***	49.88	6.36	60.34	6.75
TACL-R				
Total Scale***	92.30	10.79	104.52	8.42
Word Class & Relations***	94.47	12.97	106.21	10.45
Grammatical Morphemes***	90.37	13.07	102.81	10.72
Elaborated Sentences**	96.93	13.06	104.95	12.10
PLS				
Verbal Ability***	25.50	6.54	36.74	4.75
Articulation***	13.41	3.66	20.93	2.98
Vineland				
Total Adaptive Behavior***	85.43	12.49	97.71	10.16
Communication***	82.00	8.14	96.69	8.20
Daily Living Skills**	87.37	13.22	96.50	11.28
Socialization*	94.60	12.46	100.17	9.47
Motor Skills**	92.13	14.97	101.00	9.92
CBCL				
Total Behavior Problems**	52.57	7.85	47.14	7.24
Externalizing	50.83	7.96	48.48	7.35
Internalizing*	48.10	6.09	44.24	7.66

Note. Analyses consisted of *t* tests (df = 70); 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; MA = Mental Age.

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

one-way mirror. 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 min during free play over the 2-week period. Recording commenced on the second playgroup 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 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).

Observational Measures

Social Participation and Cognitive Play

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 the POS developed by Rubin (1985). Nonsocial play subtypes were derived from information obtained from the POS.

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: (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 each of 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 as a solitary activity), (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).

Play Observation Scale-based measures. Based on the POS, the proportion of intervals for each of the three nonsocial play subtypes for each child was calculated. This was carried out separately for each of the two observation periods (Time 1, Time 2), generating 180 coded intervals per child for each time point. Reticent behavior was indexed by summing the proportion of intervals children engaged in unoccupied or onlooking behaviors. Solitary-passive behavior was indexed by summing the proportion of intervals children engaged in solitary-

exploratory or solitary–constructive play. Finally, solitary–active behavior was indexed by summing the proportion of intervals children engaged in solitary–functional or solitary–dramatic play.

Individual Social Behaviors

Each videotape was reviewed a second time 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). Specifically, observers recorded continuously the occurrence of mutually exclusive individual social behaviors for all defined 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) joins peers in specific activity; (i) verbally supports peer's statement; (j) verbally competes with peer; (k) shows pride in product to peer; (l) expresses affection to peer; (m) shows empathy toward peer; (n) expresses hostility toward peer; (o) takes unoffered object; and (p) 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 sec.

Ten 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 (two categories tied to direct–indirect and positive–neutral dimensions), failing to follow the lead of a peer (two categories as shown earlier), 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).

Seven of the categories designed to record the social interactions of the focal child as directed to peers (a through f, p) 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.

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.

Peer interaction composites. Measures of interest were the success of social bids (proportion), total initiations, positive behavior total directed toward peers (consists of joins, verbal support, verbal competition, pride in product, expresses affection, shows empathy, lead peer direct and indirect positive or neutral, use of peer as resource, imitation, seek attention of peer, and seek agreement from peer categories), negative behavior total directed to peers (consists of expresses hostility, lead peer direct and indirect negative, and takes unoffered object), the proportion of positive interactions directed to peers, and the extent to which the target child was responsive to the positive social bids of peers. To obtain the responsiveness measure, the number of instances in which the target child responded positively was calculated (consisting of positively responding to the lead peer direct and indirect, use as a resource, seeking attention, and seeking agreement categories), as was the number of times the target child failed to respond positively to the social bids in those categories. Responsiveness was defined as the proportion of positive responses to the total.

Reliability. Prior to coding, 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-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 playgroup tapes selected on a random basis but balanced to ensure representation from the two types of social settings, developmental status groups, and time.

For the social participation and cognitive play scale (POS), reliability was based on percentage 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. 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); and cognitive play, 91% (range 87%–97%).

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 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-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, and an average of 79% (range 67%–88%) as to whether selected focal child behaviors were initiations. 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%); and initiations, 86% (range 64%–100%).

RESULTS

Effects of Setting

Three mixed design analyses of variance (ANOVAs) were performed for each of the subtypes and for each developmental status group. This was carried out for the two levels of setting (specialized vs. inclusive) with repeated measures for the time factor (Time 1 vs. Time 2). These analyses yielded nonsignificant results ($p > .05$) for setting and for setting by time interactions. Accordingly, for all subsequent analyses, specialized and inclusive groups within each developmental status group were combined.

Distribution Among Subtypes

Table 2 presents the descriptive statistics for the three nonsocial play subtypes for each developmental status group across time. The overall proportion of nonsocial play was .50 for typically developing children and .48 for children with CD ($p > .05$). As can be seen, solitary–passive play occurred most frequently for both groups.

Mixed design ANOVAs were carried out for each nonsocial play subtype with two levels of developmental status group and repeated measures for the two levels of time. Analyses for reticent and solitary active behaviors did not yield any differences between groups or across time, and the interactions were not significant ($p > .05$). Although solitary–active behavior also did not differ across groups or time, the interaction was significant, $F(1, 70) = 8.75, p < .01$. Paired t tests for each group separately showed a significant decrease over time for solitary–active behavior for children with CD, $t(29) = 2.13, p < .05$. Overall, then, children with CD and typi-

TABLE 2
 Descriptive Statistics (Proportions) for Nonsocial Play Subtypes
 by Developmental Status Group and Time

Subtype	Communication Disorder (N = 30)						Typically Developing (N = 42)					
	Time 1		Time 2		Total		Time 1		Time 2		Total	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Reticent	.09	.07	.11	.07	.10	.06	.13	.08	.13	.08	.13	.07
Solitary-passive	.25	.17	.22	.10	.23	.12	.23	.16	.22	.10	.22	.09
Solitary-active	.17	.12	.12	.09	.15	.09	.13	.11	.16	.10	.15	.09

cally developing children did not differ in terms of the extent to which they participated in each of the three subtypes of nonsocial play.

Intercorrelations Among Nonsocial Play Subtypes

A series of Pearson product–moment correlations was calculated for each developmental status group separately at both the first and second time points. As seen in Table 3, none of the subtypes for either group was significantly positively correlated with one another at either Time 1 or Time 2. Accordingly, following Coplan et al. (1994), these findings provide evidence for the existence of distinct nonsocial play subtypes for typically developing children and suggest that these subtypes apply to children with CD as well. These findings further indicate that the pattern of associations for subtypes is also similar for both developmental status groups. Specifically, none of the tests for differences (two-tailed *t* tests) between independent correlations were significant between the two developmental status groups ($p > .05$).

Stability

The stability of each subtype for individual children across time for each developmental status group is also presented in Table 3. As can be seen, significant positive correlations were found for all three subtypes for both developmental status groups with the exception of solitary–passive behavior for typically developing children.

Relationships With Child Characteristics and Peer Interaction Measures

A series of multiple regressions were carried out to examine associations between nonsocial play subtypes and both child characteristics and the social behavior with peers as observed in the playgroups. This multiple regression approach enabled us to examine the unique relationships between the nonsocial play subtypes and both child characteristics and the peer interaction measures while controlling for developmental status group. Of importance, interaction terms were used to determine the degree of similarity of patterns of association between developmental status groups.

Child characteristics. First, child characteristics were examined (see Table 1) based on WPPSI–R (Full Scale IQ and Full Scale Mental Age), the PLS verbal ability measure, TACL–R total, Vineland total, and the internalizing and externalizing scores of the CBCL. A separate analysis of the family social status measure was also carried out. Eight hierarchical multiple regressions were performed

TABLE 3
Intercorrelations Among Nonsocial Play Subtypes for Group and Time

	<i>Solitary-Passive-1</i>	<i>Solitary-Active-1</i>	<i>Reticent-2</i>	<i>Solitary-Passive-2</i>	<i>Solitary-Active-2</i>
Communication disorder					
Reticent-1	.06	-.02	.39*	-.11	-.07
Solitary-passive-1		-.25	.08	.49**	-.21
Solitary-active-1			-.18	-.15	.38*
Reticent-2				-.04	-.15
Solitary-passive-2					-.11
Typically developing					
Reticent-1	-.34*	.01	.51**	.02	-.18
Solitary-passive-1		-.38*	-.09	.22	-.01
Solitary-active-1			-.20	-.21	.50**
Reticent-2				-.15	-.39*
Solitary-passive-2					-.07

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

in which each of the seven child characteristic measures (and the one family status measure) was regressed in the following steps on: (a) a dummy-coded CD or typical child variable, (b) the three subtypes of nonsocial play behaviors (total proportions), and (c) interactions between each subtype and the CD or typical child variable. Results indicated that R^2 changes at Step 1 followed the pattern of significant differences seen in Table 1. At Step 2 of the analysis, R^2 changes and betas for subtypes were not significant ($p > .05$). However, at Step 3, significant interactions for the TACL-R and the externalizing scale of the CBCL were obtained. For the TACL-R, the pattern of results indicated that higher comprehension is associated with lower reticent behavior for typically developing children $\beta = .41, p < .05$), but is unrelated for children with CD. The pattern for externalizing was surprising in that higher externalizing ratings were not correlated with solitary-active behaviors for typically developing children but negatively associated for children with CD ($\beta = -.51, p < .01$). This anomalous finding appears to be related to three extreme scores, and differences disappear when these scores are removed. Accordingly, as anticipated, standard child characteristic measures of cognition, language, and behavior did not yield any consistent relationships with nonsocial play subtypes.

Peer interaction measures. A similar multiple regression analysis was then carried out on the composite measures based on the Individual Social Behavior Scale as presented in Table 4 (see Guralnick et al., 1996). In this case, six hierarchical multiple regressions were performed in which each of the peer-related social behavior measures was regressed on the following: (a) a dummy-coded CD/typical child variable, (b) the three subtypes of nonsocial play behaviors (proportions), and (c) interactions between each subtype and the CD/typical child variable.

At Step 1, results indicated that R^2 changes followed the pattern of significant differences between groups seen in Table 4. At Step 2, Table 5 reveals a number of interesting patterns for each of the three subtypes. It should be noted at the outset that the three subtypes showed the expected negative associations with total positive behavior to peers. In addition to that association, reticent behavior also showed trends for a negative relationship for both initiations ($\beta = -.25, p < .10$) and responsive to peers ($\beta = -.22, p < .10$). Solitary-passive behaviors were also associated negatively with the responsive to peers measure ($\beta = -.26, p < .05$). In contrast, solitary-active behaviors were negatively associated with total negative behavior to peers ($\beta = -.33, p < .01$), likely reflecting an overall lower level of interactions with peers. Responsive to peers was also significantly associated with solitary-active behaviors ($\beta = -.38, p < .01$). Also at Step 2 (see Table 5), developmental status group showed significant positive associations for successful bids ($\beta = .25, p < .05$), total positive behavior to peers ($\beta = .28, p < .05$), and positive to peers (proportion; $\beta = .30, p < .05$), confirming previous findings and trends that children with CD were less involved in positive exchanges with peers and less successful as well. Finally and of importance, the analyses of the interactions at Step 3 between

TABLE 4
Descriptive Statistics for the Peer Interaction Measures (ISBS) for Each
Developmental Status Group

	<i>Communication Disorder N = 30</i>		<i>Typically Developing N = 42</i>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Successful bids (proportion) [†]	.49	.15	.55	.10
Initiations (total)	18.23	9.21	18.31	7.21
Positive behavior to peers (total)*	55.40	28.91	70.19	24.14
Negative behavior to peers (total)	20.87	13.40	19.17	11.13
Positive behavior to peers (proportion)*	.72	.14	.79	.09
Responsive to peers (proportion)	.55	.14	.58	.10

Note. Measures are summed across two time periods. Analyses consisted of *t* tests (*df* = 70) comparing the two developmental status groups.

[†]*p* < .06. **p* < .05.

TABLE 5
Summary of Results of Hierarchical Multiple Regressions for the Peer Interaction
Measures

<i>Peer Interaction Measures</i>	<i>Group</i>	<i>Subtypes of Nonsocial Play Behavior</i>		
	<i>CD vs. Typical</i>	<i>Reticent</i>	<i>Solitary–Passive</i>	<i>Solitary–Active</i>
Successful bids (proportion)	.25*	-.15	.09	-.12
Initiations(total)	-.05	-.25	-.15	.00
Positive behavior to peers (total)	.28*	-.26*	-.52***	-.51***
Negative behavior to peers (total)	-.06	-.16	-.20	-.33**
Positive to peers (proportion)	.30*	.02	-.18	-.06
Responsive to peers (proportion)	.14	-.22	-.26*	-.38**

Note. Betas are standardized coefficients. R²change at Step 3 and betas for interactions were nonsignificant. CD = communication disorders.

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

each subtype of nonsocial play behaviors and developmental status group were not significant for any of the six dependent variables (*p* > .05). These results indicate that similar patterns of associations exist between subtypes of nonsocial play behaviors and peer-related social behaviors for both developmental status groups.

DISCUSSION

The results of this study clearly indicate that preschool-age children with CD display highly similar patterns of nonsocial play with peers in comparison to a care-

fully matched group of typically developing children. More specifically, behavioral adaptations indexed by direct observations obtained in the peer play situation that may have resulted from emotional regulation problems associated with the peer context for children with CD are not apparent. That is, any hesitancy or anxiety in joining peers (reticence) or displays of unusual behavior patterns (solitary–active behavior) do not occur more frequently in comparison to typically developing age mates. And children with CD do not increase their participation in constructive but solitary forms of play (solitary–passive). These findings for nonsocial play support Redmond and Rice's (1998) contention that children with CD may not be experiencing unusual emotion regulation problems in the peer situation despite their limited communication abilities and peer social interaction problems.

This is not to say, as a result of repeated peer difficulties and the increasing importance of peers in children's social life, that future problems will not result. Indeed, elementary school children with CD engage in substantially higher levels of reticent behavior than do children who are developing typically, and, for boys at least, display higher levels of solitary–active behavior as well (Fujiki et al., 1999). The ratings by teachers of nonsocial play subtypes in the Fujiki et al. (1999) investigation should be confirmed by future longitudinal studies utilizing observational measures in peer play situations to minimize the possibility of general bias (Rice, Hadley, & Alexander, 1993). Moreover, available longitudinal studies of the behavior problems (not peer interactions) of preschool-age children with CD in samples similar to those in this study are consistent with the observational results obtained in this study in that no evidence for overall emotional disturbance was found based on parent ratings when items representing neurodevelopmental delays were eliminated (Tallal et al., 1989). However, as children reach early elementary age, behavior problems for children with CD increase substantially, but only for children with a concomitant decline in nonverbal IQ (Benasich, Curtiss, & Tallal, 1993). These emerging behavioral problems clearly increase the likelihood of additional peer interaction difficulties (see Guralnick, 1999).

Accordingly, despite the absence of evidence for nonoptimal behavioral adaptations during nonsocial play in the peer context, concerns remain at a high level for children with CD. Specifically, in view of the fact that peer interaction problems are already evident at preschool ages, the likelihood of increased peer interaction difficulties occurring over time, and related concerns of emerging behavioral difficulties, both increased vigilance and active interventions, including preventive programs, in the domain of peer relations seem clearly warranted. This point has been effectively addressed by Hadley and Schuele (1998) along with specific suggestions for intervention strategies. Indeed, should such interventions become high priorities of professionals involved in early intervention, a better understanding of the factors contributing to peer interaction difficulties may result. By focusing on situation-specific peer play interventions that consider both verbal and nonverbal social strategies involved in the critical social tasks of peer group entry, conflict resolution, and main-

taining play within contemporary social–information processing and emotional regulation frameworks (Crick & Dodge, 1994; Guralnick, 1999; Lemerise & Arsenio, 2000; Rubin & Krasnor, 1986), an increased understanding of the complex patterns displayed by children with CD may result. Moreover, it would also be instructive to examine how these children are able, given communication difficulties, to engage in frequent episodes of productive interactions with their peers. Perhaps children with CD utilize strategies such as limiting interactions to more responsive peers or selecting play activities that make fewer communicative demands. Identifying possible strategies these children employ constitutes an important area for future study and may provide insights for interventionists working with children who are not adapting as effectively.

It is also important to highlight the relevance of nonsocial play subtypes for preschool-age children with CD. Analyses of children's peer interactions in the short-term playgroups in this study revealed that indeed distinct subtypes of nonsocial play could be identified for children with CD that were similar to those found for typically developing children. Specifically, analyses of the intercorrelation matrices provided evidence for the subtypes defined in previous work, as these subtypes were either negatively associated or uncorrelated with one another for both groups of children, and each subtype demonstrated good short-term stability. Direct comparisons between the two developmental status groups for the intercorrelation matrices did not reveal any significant differences, again providing evidence for a similar multidimensional structure for nonsocial play for children with CD and typically developing children. Moreover, multiple regression analyses for child and family characteristics and the peer interaction measures further suggested that, with minor exceptions, the subtypes of nonsocial play characterized both developmental status groups in similar ways. Finally, for both groups of children, these results were robust as similar peer interaction patterns occurred in inclusive and specialized settings. The absence of setting effects on nonsocial play subtypes is reassuring given the well-established fact that children with CD are less integrated with typically developing peers in inclusive settings (Guralnick et al., 1996; Rice et al., 1991). Whether the intervention programs mentioned earlier can influence these patterns and minimize the peer interaction problems likely to emerge over time remains a critical question for future research (see Guralnick, 2001).

Finally, it is important to point out that the participants in this study were children at the high end of the CD spectrum and consisted of boys only; consequently, our conclusions should be considered with those limitations in mind. The performance IQs, in particular, of the children with CD, although significantly lower than the typically developing group, were slightly above the population norm. Nevertheless, it is important to emphasize the absence of correlations of cognitive and language measures with the peer interaction measures. Perhaps assessments of child characteristics related more directly to social–information processes relevant

to peer competence will turn out be useful complements to more conventional child characteristic measures. Moreover, as discussed earlier, the CD population is quite heterogeneous with numerous subgroups possible based on classifications of speech characteristics and varying profiles of receptive and expressive language. Even for major subgroups, such as children with speech–language impairments (SLI), no professional consensus with respect to defining children with SLI has been achieved (Tager-Flusberg, & Cooper, 1999). Nevertheless, future work should be designed to determine whether the results of this initial study that included a broad range of children with CD can be replicated with carefully identified subgroups. Such studies can consist of large sample sizes sufficient to permit subgroup analyses or highly focused studies involving only one well-defined sample (e.g., articulation problems only). When combined with a better understanding of core deficits for many of these subgroups of children with communication disorders, potentially powerful and highly specific clinical approaches may emerge to address identified patterns of peer interaction difficulties.

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REFERENCES

- Achenbach, T. M., & Edelbrock, C. (1991). *Manual for the Child Behavior Checklist/4–18 and 1991 Profile*. Burlington: University of Vermont, Department of Psychiatry.
- Asendorpf, J. B. (1990). Development of inhibition during childhood: Evidence for situational specificity and a two-factor model. *Developmental Psychology, 26*, 721–730.
- Asendorpf, J. B. (1991). Development of inhibited children's coping with unfamiliarity. *Child Development, 62*, 1460–1474.
- Benasich, A. A., Curtiss, S., & Tallal, P. (1993). Language, learning, and behavioral disturbances in childhood: A longitudinal perspective. *Journal of the American Academy of Child and Adolescent Psychiatry, 32*, 585–594.
- Brinton, B., & Fujiki, M. (1999). Social interactional behaviors of children with specific language impairment. *Topics in Language Disorders, 19*, 49–69.
- Carrow-Woolfolk, E. (1985). *Manual for the Test for Auditory Comprehension of Language— Revised*. Allen, TX: DLM.
- Catts, H. W., Fey, M. E., Tomblin, J. B., & Zhang, X. (2002). A longitudinal investigation of reading outcomes in children with language impairments. *Journal of Speech, Language, and Hearing Research, 45*, 1142–1157.
- Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement, 20*, 37–46.

- Cole, P. M., Martin, S. E., & Dennis, T. A. (2004). Emotion regulation as a scientific construct: Methodological challenges and directions for child development research. *Child Development, 75*, 317–333.
- Coplan, R. J. (1998). Social anxiety and maladjustment in the preschool. *On-line Proceedings of the 5th Internet World Congress on Biomedical Sciences '98*, McMaster University, Hamilton, Ontario, Canada. Retrieved June 6, 1999, from <http://www.mcmaster.ca/inabis98/simantov/dus0133/index.html>
- Coplan, R. J. (2000). Assessing nonsocial play in early childhood: Conceptual and methodological approaches. In K. Gilpin-Weiner, A. Sandgrund, & C. Schaefer (Eds.), *Play diagnosis and assessment* (2nd ed., pp. 563–598). New York: Wiley.
- Coplan, R. J., Gavinski-Molina, M. -H., Lagacé-Séguin, D. G., & Wichmann, C. (2001). When girls versus boys play alone: Nonsocial play and adjustment in kindergarten. *Developmental Psychology, 37*, 464–474.
- Coplan, R. J., & Rubin, K. H. (1998). Exploring and assessing nonsocial play in the preschool: The development and validation of the preschool play behavior scale. *Social Development, 7*, 72–91.
- Coplan, R. J., Rubin, K. H., Fox, N.A., Calkins, S. D., & Stewart, S. L. (1994). Being alone, playing alone, and acting alone: Distinguishing among reticence and passive and active solitude in young children. *Child Development, 65*, 129–137.
- Coplan, R. J., Wichmann, C., & Lagacé-Séguin, D. G. (2001). Solitary-active play behavior: A marker variable for maladjustment in the preschool? *Journal of Research in Childhood Education, 15*, 164–172.
- Crick, N. R., & Dodge, K. A. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin, 115*, 74–101.
- Doyle, A., Connolly, J., & Rivest, L. (1980). The effect of playmate familiarity on the social interactions of young children. *Child Development, 51*, 217–223.
- Fey, M. E., Catts, H. W., & Larrivee, L. S. (1995). Preparing preschoolers for the academic and social challenges of school. In M. E. Fey, J. Windsor, & S. F. Warren (Eds.), *Language intervention Vol. 5. Preschool through the elementary years* (pp. 3–37). Baltimore: Brookes.
- Ford, J. A., & Milosky, L. M. (2003). Inferring emotional reactions in social situations: Differences in children with language impairment. *Journal of Speech, Language, and Hearing Research, 46*, 21–30.
- Fujiki, M., Brinton, B., Morgan, M., & Hart, C. H. (1999). Withdrawn and sociable behavior of children with language impairment. *Language, Speech, and Hearing Services in Schools, 30*, 183–195.
- Fujiki, M., Brinton, B., & Todd, C. M. (1996). Social skills of children with specific language impairment. *Language, Speech, and Hearing Services in Schools, 27*, 195–202.
- Gertner, B. L., Rice, M. L., & Hadley, P.A. (1994). Influence of communicative competence on peer preferences in a preschool classroom. *Journal of Speech and Hearing Research, 37*, 913–923.
- Guralnick, M. J. (1992). A hierarchical model for understanding children's peer-related social competence. In S. L. Odom, S. R. McConnell, & M. A. McEvoy (Eds.), *Social competence of young children with disabilities: Issues and strategies for intervention* (pp. 37–64). Baltimore: Brookes.
- Guralnick, M. J. (1999). Family and child influences on the peer-related social competence of young children with developmental delays. *Mental Retardation and Developmental Disabilities Research Reviews, 5*, 21–29.
- Guralnick, M. J. (2001). Social competence with peers and early childhood inclusion: Need for alternative approaches. In M. J. Guralnick (Ed.), *Early childhood inclusion: Focus on change* (pp. 481–502). Baltimore: Brookes.
- Guralnick, M. J., Connor, R., Hammond, M., Gottman, J. M., & Kinnish K. (1996). The peer relations of preschool children with communication disorders. *Child Development, 67*, 471–489.
- Guralnick, M. J., Hammond, M. A., & Connor, R. T. (2003). Subtypes of nonsocial play: Comparisons between young children with and without developmental delays. *American Journal on Mental Retardation, 108*, 347–362.

- Hadley, P. A., & Rice, M. L. (1991). Conversational responsiveness of speech- and language-impaired preschoolers. *Journal of Speech and Hearing Research, 34*, 1308–1317.
- Hadley, P. A., & Schuele, C. M. (1998). Facilitating peer interaction: Socially relevant objectives for preschool language intervention. *American Journal of Speech-Language Pathology, 7*, 25–36.
- Harrist, A. W., Zaza, A. F., Bates, J. E., Dodge, K. A., & Pettit, G. S. (1997). Subtypes of social withdrawal in early childhood: Sociometric status and social-cognitive differences across four years. *Child Development, 68*, 278–294.
- Hollenbeck, A. R. (1978). Problems of reliability in observational research. In G. P. Sackett (Ed.), *Observing behavior: Vol. 2. Data collection and analysis methods* (pp. 79–98). Baltimore: University Park Press.
- Hollingshead, A. B. (1975). *Four factor index of social status*. Unpublished manuscript, Yale University, Department of Sociology, New Haven, CT.
- Kelly, D. P., & Sally, J. I. (1999). Disorders of speech and language. In M. D. Levine, W. B. Carey, & A. C. Crocker (Eds.), *Developmental-behavioral pediatrics* (3rd ed., pp. 621–631). Philadelphia: Saunders.
- Lemerise, E. A., & Arsenio, W. F. (2000). An integrated model of emotion processes and cognition in social information processing. *Child Development, 71*, 107–118.
- Leonard, L. B. (1998). *Children with specific language impairment*. Cambridge, MA: MIT Press.
- McCauley, R. J. (2001). *Assessment of language disorders in children*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Parten, M. B. (1932). Social participation among preschool children. *Journal of Abnormal Social Psychology, 27*, 243–269.
- Redmond, S. M., & Rice, M. L. (1998). The socioemotional behaviors of children with CD: Social adaptation or social deviance? *Journal of Speech, Language, and Hearing Research, 41*, 688–700.
- Rice, M. L., Hadley, P. A., & Alexander, A. L. (1993). Social biases toward children with speech and language impairments: A correlative causal model of language limitations. *Applied Psycholinguistics, 14*, 445–471.
- Rice, M. L., Sell, M. A., & Hadley, P. A. (1991). Social interactions of speech- and language-impaired children. *Journal of Speech and Hearing Research, 34*, 1299–1307.
- Rubin, K. H. (1982). Nonsocial play in preschoolers: Necessarily evil? *Child Development, 53*, 651–657.
- Rubin, K. H. (1985). *The Play Observation Scale (POS)* (Rev.). Waterloo, Ontario: University of Waterloo.
- Rubin, K. H. (2000). *The Play Observation Scale*. University of Maryland, College Park, MD: Author.
- Rubin, K. H., & Asendorpf, J. B. (1993). Social withdrawal, inhibition, and shyness in childhood: Conceptual and definitional issues. In K. H. Rubin & J. B. Asendorpf (Eds.), *Social withdrawal, inhibition, and shyness in childhood* (pp. 3–17). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Rubin, K. H., Coplan, R. J., Fox, N. A., & Calkins, S. D. (1995). Emotionality, emotional regulation, and preschoolers' social adaptation. *Development and Psychopathology, 7*, 49–62.
- Rubin, K. H., & Krasnor, L. R. (1986). Social-cognitive and social behavioral perspectives on problem solving. In M. Perlmutter (Ed.), *The Minnesota Symposia on Child Psychology: Vol. 18. Cognitive perspectives on children's social and behavioral development* (pp. 1–68). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Rubin, K. H., & Mills, R. S. L. (1988). The many faces of social isolation in childhood. *Journal of Consulting and Clinical Psychology, 56*, 916–924.
- Rubin, K. H., Stewart, S., & Coplan, R. J. (1995). Social withdrawal in childhood: Conceptual and empirical perspectives. In T. H. Ollendick & R. J. Prinz (Eds.), *Advanced in clinical child psychology* (Vol. 17, pp. 157–196). New York: Plenum.
- Schachter, D. C. (1996). Academic performance in children with speech and language impairment: A review of follow-up research. In J. H. Beitchman, N. J. Cohen, M. M. Konstantareas, & R. Tannock

- (Eds.), *Language, learning, and behavior disorders* (pp. 515–529). New York: Cambridge University Press.
- Shea, J. D. C. (1981). Changes in interpersonal distances and categories of play behavior in the early weeks of preschool. *Developmental Psychology, 17*, 417–425.
- Smilansky, S. (1968). *The effects of sociodramatic play on disadvantaged preschool children*. New York: Wiley.
- Sparrow, S. S., Balla, D. A., & Cicchetti, D. V. (1984). *Vineland Adaptive Behavior Scales*. Circle Pines, MN: American Guidance Service.
- Stark, R. E., & Tallal, P. (1981). Selection of children with specific language deficits. *Journal of Speech and Hearing Disorders, 46*, 114–122.
- Tager-Flusberg, H., & Cooper, J. (1999). Present and future possibilities for defining a phenotype for specific language impairment. *Journal of Speech, Language, and Hearing Research, 42*, 1275–1278.
- Tallal, P., & Benasich, A. A. (2002). Developmental language learning impairments. *Development and Psychopathology, 14*, 559–579.
- Tallal, P., Dukette, D., & Curtiss, S. (1989). Behavioral/emotional profiles of preschool language-impaired children. *Development and Psychopathology, 1*, 51–67.
- Wechsler, D. (1989). *Wechsler Preschool and Primary Scale of Intelligence — Revised*. San Antonio, TX: Psychological Corporation.
- White, B. L., & Watts, J. C. (1973). *Experience and environment* (Vol. 1). Englewood Cliffs, NJ: Prentice Hall.
- Wilson, B. (1999). Entry behavior and emotion regulation abilities of developmentally delayed boys. *Developmental Psychology, 35*, 214–222.
- Zimmerman, I. L., Steiner, V. G., & Pond, R. E. (1979). *Preschool language scale* (Rev. ed.). Columbus, OH: Merrill.