

Conversational Responsiveness of Speech- and Language-Impaired Preschoolers

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The purpose of this study was to describe preschoolers' conversational responsiveness in an integrated classroom setting. Variables of primary interest were the types of responses as a function of the conversational partner. The children were categorized according to language ability: normally developing, marginal (children previously diagnosed as language or speech impaired, but now functioning within the normal range), language impaired (LI), and speech impaired (SI). They were observed during free play. Differences in response types were apparent between groups with both adult and peer partners. LI and SI children were ignored by their peers and responded less often when a peer initiated to them. Hence, they participated in proportionately fewer peer interactions. These results suggest that peer interaction difficulties may be concomitant consequences of early speech and language impairments. Clinical implications for verbal interactive skill intervention, particularly with peers in classroom settings, are discussed.

KEY WORDS: social interactions, language impairments, speech impairments, discourse, child language

Verbal interactive skills are central to theories of language development in the social context (Bates, 1976; Bates, Bretherton, Beeghly-Smith, & McNew, 1982; Berko-Gleason, Hay, & Cain, 1989; Lewis & Cherry, 1977; MacDonald & Gillette, 1984; Nelson, 1989). During verbal interactions embedded in play, children learn how to use language to meet their social needs. The development of these skills is believed to create opportunities for language learning. MacDonald (1985) states that "maintaining the child in the turn-taking format exposes the child to more language and better conversational models than do short didactic interchanges" (p. 100). The availability of several conversational partners may also facilitate language learning. Nelson (1989) posits that access to several partners is beneficial insofar as different styles of linguistic input may be differentially facilitative for individual children. Therefore, a variety of input styles could increase the probability of obtaining effective matches between children and their partners.

Participation in verbal exchanges requires basic conversational skills. Primary among these are (a) the ability to initiate an interaction (assertiveness) and (b) the ability to appropriately respond to and thereby maintain an interaction (responsiveness). Normally developing children demonstrate considerable individual variability in their rates of initiation, although less variability is evident in their responsiveness to and from conversational partners (Greenwood, Walker, Todd, & Hops, 1981). Several studies have documented increases in peer interaction and verbal responsiveness with age (Greenwood et al., 1981; Holmberg, 1980; Mueller, Bleier, Krakow, Hegedus, & Cournoyer, 1977; Reuter & Yunik, 1973). Furthermore, Greenwood and his colleagues found that by age 3 children are successful in obtaining and providing reciprocity in peer interaction more than 90% of the time.

Children with speech and language impairments, on the other hand, may encounter several complications in initiating and maintaining verbal interactions with their peers. Even among children with age-appropriate language skills, Mueller (1972) found the highest predictors of interaction failure were unintelligibility and grammatically unclear utterances. If a message is unintelligible or makes little sense, it may be difficult to interpret communicative intentions (Duchan, 1989). In addition, language-impaired children demonstrate reduced responsiveness to their adult conversational partners (Rosinski-McClendon & Newhoff, 1987). Contributing factors may be limited comprehension (Craig & Evans, 1989) or a growing awareness of an inability to communicate effectively. Taken together, such repeated experiences of conversational failure may discourage the child's interactive attempts or inhibit partners from engaging in future interactions when previous experiences have not been mutually reinforcing (Strain, Odom, & McConnell, 1983).

Little is known about peer interactions specific to children whose primary handicapping condition is a speech and/or language impairment, although some information about the influence of communicative limitations can be inferred from studies of children with mild to moderate mental retardation (e.g., Guralnick, 1980; Guralnick & Groom, 1985; Guralnick & Groom, 1987) or hearing impairments (e.g., Lederberg, 1986; Vandell & George, 1981). Conflicting conclusions have been reported regarding the interactive profiles of these children. Some of this work has concluded that these children initiate interactions less frequently than do normally developing children (e.g., Levy-Shiff & Hoffman, 1985; Stipek & Sanborn, 1985), whereas other investigators have reported no differences in the general rate of initiation (Vandell & George, 1981). Asher, Markell, and Hymel (1981), however, suggest that differences may not be revealed by general rates of interaction. For example, counts of initiations do not provide information about the outcome of initiation attempts, yet the outcome is likely to influence the rate of initiations. Initiations that are ignored or rebuffed are less likely to support equivalent learning opportunities.

Recent literature has focused on the need to assess and remediate conversational skills of speech- and language-impaired children (Fey, 1986; Paul, 1985; Rice, *in press*; Rice, Sell, & Hadley, 1990; Roth & Spekman, 1984) although relatively little is known about the use of these skills in integrated classroom settings. At the same time there is growing recognition of the advantages of naturalistic language intervention environments (Norris & Hoffman, 1990). Classroom-based intervention draws on theoretical positions that emphasize language learning within the social context. Language teachers need not be adults; interactions with more linguistically advanced peers may also facilitate language learning (Nelson, 1989). Given these assumptions, there is an immediate need to evaluate the interaction patterns of speech- and language-impaired children.

In an initial study of the social interactions of speech- and language-impaired children in an integrated classroom, we found that they differed from their normally developing peers in several ways (Rice, Sell, & Hadley, 1991). Normal-language preschool peers were more likely to initiate interactions with each other than with speech- and language-

impaired children, and they had a higher percentage of longer responses. Furthermore, the normal-language peers were the preferred addressee in all peer initiations. In contrast, children with limited communication skills were more likely than their normal-language peers to initiate to adults and to shorten their responses or use nonverbal responses. We concluded that preschoolers are sensitive to their relative communication abilities and make corresponding adjustments in their patterns of social interaction.

One possible reason for the speech- and language-impaired children's relative reluctance to initiate to their normally developing peers may be a lack of responsiveness on the part of peers. The coding system of the Rice et al. (1991) study did not capture interlocutor responses. Therefore, the purpose of this study was to determine whether there was a difference in the types of responses received by normal-language, marginal (children previously diagnosed as speech or language impaired, now testing within the normal range of development), language-impaired (LI), and speech-impaired (SI) preschoolers during verbal interactions. More specifically, the question was whether initiations meet with (a) a response that prompts the child's next turn; (b) an acknowledgment; (c) attention, but no response; or (d) ignoring the initiation. Procedures developed by Rice et al. (1990) were used, with modification of the coding system to focus on the sequential responses of the conversational partners. This allowed us to assess the degree to which partners maintained verbal interactions with speech- and language-impaired children.

Method

Setting

The current investigation was conducted in the Language Acquisition Preschool (LAP), University of Kansas, Lawrence. LAP is an integrated preschool serving children of various language abilities (Rice & Wilcox, 1986). At the time of the study, LAP provided services to a total of 26 children, 13 children in each of two daily sessions, one in the morning and another in the afternoon. To be enrolled in LAP, all children must satisfy several admission criteria. First, children must be between the ages of 3 and 5. They must also demonstrate normal intelligence on the Kaufman Assessment Battery for Children (Kaufman & Kaufman, 1983) and normal social/emotional development. Finally, they must not have a physical or visual handicap or a hearing loss. Children are placed in language groups according to performance on a battery of language measures. Approximately one third of the children are developing language normally, one third are learning English as a second language (ESL), and one third are delayed in speech and language development. Children in the speech- and language-impaired group must meet at least two of the following criteria: (a) a score below one standard deviation of the mean on the Peabody Picture Vocabulary Test-Revised (PPVT-R, Dunn & Dunn, 1981); (b) a score below the 25th percentile on the receptive portion of the Reynell Developmental Language Scales-Revised (Reynell, 1985); (c) an MLU below the predicted range for chronolog-

ical age (Miller, 1981); and (d) nonmastery of at least two age-appropriate grammatical morphemes (GM) (de Villiers & de Villiers, 1973).

Subjects

Children enrolled in the speech- and language-impaired and language-normal groups served as target children in this study. ESL children were not included as target children, although they were potential peer partners because of the configuration of the classroom. For the purpose of this study, the children originally enrolled in the preschool in the speech- and language-impaired group were divided into three subgroups. A total of 18 children were placed in four groups: LI, 4; SI, 4; marginal language, 4; and language normal, 6.

The LI children satisfied the original enrollment criteria for the speech- and language-impaired group provided above. In consideration of previous research conducted on the social interactions of speech- and language-impaired children, two additional groups, the SI and marginal groups, were then formed. Rice et al. (1991) observed differences relative to the other groups in the patterns of interactions for children with limited intelligibility in conversational speech. Therefore, children with multiple articulation errors that were outside the developmentally appropriate range on the Goldman-Fristoe Test of Articulation (Goldman & Fristoe, 1969) were reclassified as SI. These articulation errors seriously affected the children's intelligibility. Although also displaying characteristics similar to the LI group—e.g., reduced mean length of utterance (MLU), lack of grammatical morphemes—the feature discriminating these groups was the pervasiveness of their speech problems and associated unintelligibility (see Table 1).

The marginal group consisted of children who had been enrolled in LAP as speech- and/or language-impaired in the previous year. These children had made significant progress and although they no longer fit the LI subject criteria, they continued to attend LAP. They received the support of the language-enriched classroom curriculum, although specific

goals were not formally targeted. Even though the speech and language skills of these children were within the normal range of development, it is possible that their interactive skills might be different from the group developing language normally as a consequence of previous delays. (See Table 1 for a descriptive profile of children in the LI, SI, and marginal groups.) The scores for the PPVT-R, Reynell, MLU, and grammatical morphemes presented in Table 1 were obtained in the fall semester preceding data collection, whereas the Goldman-Fristoe percentiles were obtained during the spring semester concurrent with data collection. In addition, the performance of Subject 6 and Subject 11 requires some explanation. Although Subject 6 demonstrated an MLU within the normal range, it was inflated by the use of carrier phrases and nonspecific vocabulary (e.g., "I want those things there, please"). For Subject 11, the K-ABC scores fell outside the normal range. Classroom performance, however, suggested that these low scores were a consequence of severe language impairment and lack of experience with the testing format rather than a significant developmental delay. This impression was subsequently confirmed by average performance on the PPVT-R during the kindergarten year (PPVT-R standard score = 94) and placement in a regular kindergarten classroom.

At the time of this investigation, all children were between the ages of 42 and 66 months and had been enrolled for at least one semester in LAP. All groups had equivalent numbers of boys and girls, with the exception of the LI group. (See Table 2 for demographic information.)

Procedure

Observational data were collected for each child on six separate occasions. Each observation was 4 min in length for a total of 24 min of data per child. All observations occurred within a 6-week period of time. An on-line coding procedure was used. (See Rice et al., 1990, for a discussion of the relative advantages and limitations of on-line versus videotaped data collection.)

TABLE 1. Subject information.

Subject	Group ^a	Age in mos.	Sex	K-ABC ^b Processing/Achievement	PPVT ^c	Reynell ^d Receptive/Expressive	MLU ^e (MLU/%ile)	Gram morph ^f	Goldman-Fristoe ^g %ile
1	M	55	M	100/91	101	1.2/-0.3	4.32/46	9	83
2	M	62	M	100/105	98	0.5/0.0	5.58/59	12	27
3	M	62	F	96/106	103	0.0/1.4	6.22/79	12	34
4	M	64	F	100/90	100	-0.1/-0.1	6.99/87	7	99
5	LI	56	M	96/90	95	-0.9/-2.4	3.70/16	1	47
6	LI	56	M	93/93	67	-0.7/0.7	4.94/59	9	41
7	LI	42	M	107/89	90	-1.7/-1.3	2.91/23	2	39
8	LI	46	M	95/101	87	-0.1/-0.8	2.96/16	4	49
9	SI	58	F	96/96	103	0.1/-1.2	3.23/7	7	1
10	SI	64	M	87/78	63	-2.6/-3.0	3.06/2	5	11
11	SI	57	M	73/65	41	-3.0/-3.0	3.21/4	2	7
12	SI	52	F	126/113	102	-0.5/0.4	3.12/6	7	18

^aM = marginal, LI = language impaired, SI = speech impaired. ^bProcessing/Achievement composite scores on the Kaufman Assessment Battery for Children (Kaufman & Kaufman, 1983). ^cStandard scores on Peabody Picture Vocabulary Test-Revised (Dunn & Dunn, 1981). ^dReceptive/Expressive standard scores ($M = 0$, $SD = 1$) on Reynell Developmental Language Scales-Revised (Reynell, 1985). ^eMean length of utterance (MLU) and percentile rank calculated by Miller's (1981) criteria. ^fNumber of grammatical morphemes mastered according to de Villiers and de Villiers (1973) criteria. ^gPercentile rank on Goldman-Fristoe Test of Articulation (Goldman & Fristoe, 1969).

TABLE 2. Demographic information.

Group	Boys <i>n</i>	Girls <i>n</i>	Age in mos.		Semesters enrolled	
			<i>M</i>	Range	<i>M</i>	Range
Normal	3	3	52	45–66	2	1–4
Marginal	2	2	60.75	55–64	4	3–5
Language	4	0	50	42–56	1	
Speech	2	2	57.75	52–64	1.5	1–3

The verbal interactions of the target children and their partners, both teachers and peers, were coded by investigator Hadley during the regularly scheduled 40-min play-center time. Play-center time was divided into six coding blocks. The interactions of a different target child were coded in each block, counterbalanced for order. Coding began after all children had arrived at their chosen play center. This signaled the beginning of the first block. Interactions were coded continuously for a 4-min period, followed by a 2-min break prior to the beginning of the second block. This coding procedure was repeated until six blocks were completed or the children were given instructions to clean up.

During play-center time, children choose to play in four areas of the classroom where different activities are available: (a) *dramatic play*, where children role play the theme of the day; (b) *art table*, which offers various types of coloring, cutting, and pasting activities; (c) *quiet area*, consisting of books, puzzles, and various Fischer-Price toys; and (d) *block area*, providing building blocks, cars, and trucks. Children are free to move among these areas during the 40-min play-center time. While following the target child, the investigator moved freely throughout the classroom as unobtrusively as possible. She did not actively participate in any of the play activities. If a child initiated a question or comment to the investigator, she did not respond to the initiation. Interactions with the investigator were recorded but excluded from data analysis, given the emphasis on partner responses.

Coding System

Major components captured by this particular coding system included the choice of play area and conversational partners within verbal interactions. Of special interest were the types of responses following interaction attempts. The investigator identified the area of the classroom and the number of children and adults present in that area at the beginning of each block. Additional codes were recorded as the child changed areas. The child-teacher ratio was recorded each minute. As verbal interactions occurred, the conversational partner was identified in order to determine whether there were differences in interaction patterns as a function of partner. Verbal interactive coding began with an interaction attempt by the target child or an attempt addressed to him/her. Once an interaction was initiated, the following responses were coded according to whether they (a) prompted the next turn in the interaction; (b) acknowledged the previous turn; (c) attended, but offered no response; or (d) ignored the previous turn. Response codes of both the target child and his/her conversational partner were

recorded sequentially until the interaction ended. (See Appendix for coding definitions.)

Training Procedures and Reliability

The coding system was piloted in the classroom over a 1-month period during the semester prior to data collection. The investigator then trained an independent observer on the coding system, first on videotaped segments and then in the classroom. The training phase began with the explanation of coding definitions both in discussions and while viewing videotaped segments. Following this, videotaped segments were coded by both observers. Differences in interpretations were discussed as the segments were replayed. These resolutions guided future coding.

Approximately 10 hours of training occurred on videotaped segments and in the classroom over a 3-week period. A final videotaped segment was coded and interjudge reliability was calculated. Point-by-point reliability was calculated by dividing the number of coding agreements by the total number of agreements and disagreements. During the training phase, both observers noted 94% of all interactions and 100% of all conversational turns (e.g., interaction attempts and response types) on the final videotaped sample. The reliabilities for each category were as follows: area 100%, partner 88%, turns 90%, and interaction endings 82%. Reliability during on-line classroom observations during training was calculated at 78% for all interactions and 87% for all turns across six blocks. Category reliabilities were as follows: area 100%, partner 93%, turns 90%, and interaction endings 93%.

Thirteen blocks were coded simultaneously by both observers during data collection, accounting for 12% of all observations. Both observers noted 74% of all interactions and 90% of all turns. Reliabilities for each category were as follows: area 100%, partner 98%, turns 88%, and interaction endings 85%. Error analysis on the interactions in disagreement indicated that two thirds of the omission errors were initiated by a partner. In these situations, the target child gave no response approximately half of the time. This was a primary source of omitted turns as well. Only one third of the disagreements occurred when the target child initiated the interaction attempt. Furthermore, 71% of interactions in disagreement occurred in areas where five or more persons were present (excluding the observers). Greater disagreement appeared to be related to an increase in available partners, which necessarily broadened the observer's field of focus.

Results

General Patterns of Interactions

One-way ANOVAs indicated that there were no significant differences in the number of interactions among the four language groups, $F(3, 17) = 1.43, p > .05$, or the number of total conversational turns, $F(3, 17) = 0.82, p > .05$. Thus, all children were engaged in similar levels of interaction in the classroom. Summaries of interactions and total turns are provided in Table 3.

Further analyses by conversational partner, however, revealed rather different results. The interactions were coded as involving an adult or a child. Approximately half of the interactions of normal-language and marginal children were with their peers, 45% and 51%, respectively, whereas the LI and SI children participated in peer interactions only 35% and 34% of the time. The test for significance between two proportions (Bruning & Kintz, 1977) indicated that LI children participated in significantly fewer peer interactions than the normal-language and marginal children ($z = -2.19, -3.21$, respectively; $p < .05$). The difference between LI and marginal children may have been partially influenced by the marginal children's age advantage. On the other hand, the SI children were comparable in age to the marginal group and older than the normal-language children and still participated in significantly fewer peer interactions than both groups ($z = -3.64, -2.63$, respectively; $p < .05$).

Reciprocity of Peer and Adult Partners

Four possible combinations of interaction attempt-response sequences were of interest: (a) target child initiates—peer responds (Table 4), (b) target child initiates—adult responds (Table 4), (c) peer initiates—target child responds (Table 5), and (d) adult initiates—target child responds (Table 5). This division into child-child and adult-child interactions led to empty cells. Three empty cells occurred when the target child initiated interactions (see Table 4) and two when conversational partners addressed the target child (see Table 5). These cells were not included in statistical analyses. All proportional data were analyzed with the test for significance between two proportions (Bruning & Kintz, 1977). This test took the raw frequencies contributing to each proportion into consideration, therefore controlling for the low frequencies across some response types.

Responses of the peer partners. An acknowledgment from peer partners was the most typical response type when

target children initiated the interaction to a peer (see Table 4) irrespective of group classification. In contrast, peer partners ignored twice as many of the SI and LI children's initiations, as compared to the children with normal and marginal language skills. These differences reached statistical significance for contrasts involving the marginal children ($z = 2.12, 2.24$, respectively; $p < .05$).

Responses of the adult partners. There were no group differences when target children initiated the interaction to adults (see Table 4). Adults most often acknowledged children's initiations or prompted the next turn, except in the case of the marginal children. Adults ignored 22% of the marginal children's attempts in comparison to 12% of the normal-language children's attempts. This difference did not reach statistical significance. Overall, the adults were very responsive to children's initiations, acknowledging more than half of the initiations and prompting additional conversational turns nearly a quarter of the time. Collapsing across language groups, adults prompted target children's next conversational turns (24%) significantly more often than peers (4%; $z = 2.20, p < .05$).

It should be noted that this high level of teacher responsiveness may not be representative of all preschool settings. For example, Pecyna Rhyner, Lehr, and Pudlas (1990) report that in their observations in two classrooms of children with developmental delays, the teachers responded and maintained interactions for only 38% of the child initiations in child-directed activities and a mere 13% of the initiations during teacher-directed activities. In contrast, the high level of responsiveness of the adults in LAP is an emphasized feature of the language facilitation curriculum.

Responses to the peer partners. An acknowledgment was the most likely response for all groups when they were addressed by peers. There were no differences for the prompt, acknowledge, or ignore response types. Significant differences were apparent between normal-language, LI, and SI children for no response (see Table 5). Although LI and SI children attended to their conversational partners, they were less likely to respond to peers than normally developing children ($z = 2.99, 2.50$, respectively; $p < .05$). LI children did not respond to their peers' interaction attempts 30% of the time. Similarly, SI children did not respond 27% of the time. Although the opportunities to respond were minimal for both the LI and SI children, this finding is significant in and of itself. These children were addressed by their peers half as frequently as children with age-appropriate language skills. This lack of social integration in peer interactions is also consistent with our previous findings that the normal-language children in the classroom are preferred conversational partners (see Rice et al., 1991, for a discussion).

Responses to the adult partners. When target children were addressed by an adult, all groups tended to respond with an acknowledgment. This ranged from 71% to 89% across the groups. LI and SI children were more likely to give no response ($z = 2.01, 2.40$, respectively; $p < .05$; see Table 5). The children were equally likely to prompt or ignore the interaction attempt. These response types occurred infrequently for all groups (six times or fewer).

TABLE 3. Mean number of interactions and conversational turns.

Group	n	Interactions		Conversational turns	
		M	SD	M	SD
Normal	6	61.33	8.1	95.33	18.6
Marginal	4	62.25	8.7	85.25	8.4
Language	4	48.75	12.5	71.00	31.7
Speech	4	52.50	16.9	78.50	36.3

TABLE 4. Proportion of response types of peers and adults to the initiations of four language groups.

Initiator	Responder	Type of response							
		Prompt		Acknowledge		No response		Ignore	
		Prop.	No.	Prop.	No.	Prop.	No.	Prop.	No.
Normal	Peer	.05	5	.58	60	.23	23	.15	15
		.05	3	.62	48	.20	14	.12 ^{a,b}	7
	Adult	.03	2	.49	24	.20	10	.28 ^a	11
		.07	2	.51	21	.14	6	.27 ^b	15
Marginal	Peer	.25	25	.57	58	.05	6	.12	12
		.15	8	.62	31			.22	14
	Adult	.26	10	.56	15			.17	7
		.29	17	.67	32	.04	2		

Note. Empty cells represent absence of response type.

^{a,b}Like letters indicate significant differences between the two proportions, $p < .05$, two-tailed test.

TABLE 5. Proportion of response types of four language groups to the initiations of peers and adults.

Initiator	Responder	Type of response							
		Prompt		Acknowledge		No response		Ignore	
		Prop.	No.	Prop.	No.	Prop.	No.	Prop.	No.
Peer	Normal	.05	4	.68	42	.07 ^{a,b}	4	.21	9
		.05	3	.64	34	.15	8	.16	9
	Adult	.06	2	.54	17	.30 ^a	8	.10	2
		.06	2	.67	18	.27 ^b	5	.06	1
Adult	Peer	.06	5	.84	59	.09	6	.08	1
		.06	5	.89	37	.05 ^{c,d}	2	.05	2
	Adult	.01	1	.75	59	.20 ^c	16	.06	6
		.03	3	.71	54	.21 ^d	16	.04	4

Note. Empty cells represent absence of response type.

^{a,b,c,d}Like letters indicate significant differences between the two proportions, $p < .05$, two-tailed test.

Interactive Successfulness

The four types of responses can be reduced to a dichotomy regarding their function in maintaining a verbal interaction. Both prompts and acknowledgments preserve the ongoing nature of interactions, whereas no response and ignore may terminate conversations. Successful turns can be defined as interaction attempts followed by a prompt or acknowledgment as well as turns embedded within an ongoing interaction. The proportion of successful turns out of the total number of turns can then be calculated. Total turns is the sum of unsuccessful interaction attempts (those attempts that did not elicit a response) and successful turns (see Table 6). The proportion of successful turns did not vary for the

normal-language children when indexed by partner, whereas the marginal children appeared to be more successful in their peer interactions than in interactions with adults ($z = 2.08$; $p < .05$). In contrast, the SI children showed significantly less success in their interactions with other children as compared to adults ($z = -3.93$; $p < .05$), whereas the LI children showed marginally less success with other children ($z = 1.85$; 1 point below the z score of 1.86 required for a p of .05). Success with peers was relatively consistent for normal-language, marginal, and LI children. Only SI children showed less than 80% success in conversational turns with peers.

TABLE 6. Proportion of successful turns of four language groups with peer and adult partners.

Language group	Peer partner		Adult partner	
	Total turns	Proportion successful	Total turns	Proportion successful
Normal	248	.80	324	.85
Marginal	166	.84 ^a	175	.75 ^a
Language	118	.83	166	.90
Speech	99	.75 ^b	215	.91 ^b

^{a,b}Like letters indicate significant differences between the two proportions, $p < .05$, two-tailed test.

Discussion

At a general level, the results of this study indicate that children with limited communication skills participate in proportionately fewer peer interactions than do their normally developing peers in an integrated classroom. This finding has now been replicated in LAP across two samples of children and a change in teaching staff between the sampling periods (Rice et al., 1991). Similar rank orders across the two studies in the proportion of peer interactions (i.e., marginal > normal > LI > SI) support the conclusion that relative communication abilities influence preschool children's participation in social interactions.

The findings from this study suggest that at least part of the differences in social interaction may be attributable to the responses of their peers. When the LI and SI children initiated a conversational move, they were more likely to be ignored than were their normal peers. Two factors are implicated in this finding. One is the limited intelligibility of some of the children, insofar as the lowest proportion of successful turns (75%) was for SI children. This finding is consistent with Mueller's (1972) observation that for normally developing children the highest predictors of interaction failure were unintelligibility and grammatically unclear utterances.

A second factor, that of attention elicitation, is suggested by the distinction between ignore and no response in the coding scheme. An *ignored* response was when the child did not attend to the previous turn, whereas *no response* was when the child attended but did not respond. In other words, the two categories differed in the addressee's attention. The ignored responses imply that the other children were less likely to pay attention to the LI or SI children's initiations. A closely related possibility may be that the communicatively limited children were less likely to gain a partner's attention prior to initiating. If they did not first gain attention by increasing physical proximity, establishing eye contact, or using a vocative or other appropriate conversational devices, their initiation attempts may have been less likely to connect with their interlocutors. These attention-getting discourse devices were not recorded in this study and are worthy of further investigation.

In addition to the role played by the classroom peers as respondents, the study suggests that inadequacies of the SI and LI children as responders were implicated in the breakdowns in their conversational interactions. They were more likely than their normal peers to not respond to conversational initiations, something that happened more than 25% of the time when they were addressed. Several hypotheses may be generated to explain this lack of responsiveness. LI and SI children may not have understood the previous utterance or been able to formulate an immediate response. They may have been avoiding an anticipated communication difficulty or lacked motivation for the activity or topic. It is quite possible that these are not independent factors but instead interact and mutually contribute to limited conversational skills. Although these children did not differ from their normal peers in the proportion of acknowledgments to initiations, this category did not distinguish among them according to length of response (e.g., multiword vs. one-word response) nor mode of response (verbal vs. nonverbal). Children were credited with maintaining the interaction with any response, regardless of response mode or linguistic complexity. Had these been differentiated codes, more striking differences might have been apparent in the strategies used to maintain interactions (Rice et al., 1991).

In evaluating the results of this study, it is necessary to consider demographic and contextual variables that have influenced peer versus adult interaction in previous research. Research with children who are developing normally and those who have developmental delays has provided the following general conclusions: (a) peer interaction increases with age in the preschool years (Greenwood et al., 1981;

Guralnick & Weinhouse, 1984; Holmburg, 1980; Mueller, 1972; Reuter & Yunik, 1973); (b) boys interact at a higher rate than girls (Greenwood et al., 1981; Mueller, 1972); (c) situational factors (e.g., playmate familiarity, play activities) influence social participation (Guralnick & Groom, 1985).

Relative to this study, the apparent similarity of the marginal group to the language-normal group may have been related to two advantages: the marginal children's advanced age and longer enrollment in LAP. The mean ages of the LI and SI groups, however, were very similar to that of the normal-language group, and therefore age would not account for these group differences. The second advantage, that of length of enrollment, can be addressed by limiting the group comparisons to children who had completed only one semester in LAP prior to data collection. This adjustment eliminated the marginal-language group, 2 children from the normal-language group, and 1 child from the SI group. Although this adjustment reduced the mean age of the normal-language group to 46 months, the normal-language group continued to participate in proportionately more peer interactions (41%) than the older LI and SI groups (both 35%). Such a finding supports the interpretation that language ability plays a significant role in peer interactions above and beyond the contributions of age and length of enrollment.

The nature of play activities also must be taken into consideration when interpreting the proportion of peer interaction. Observations took place in a relatively child-directed time in which children were able to move freely among the four play centers. Children showed preferences among these four centers, with only six children interacting in three or four areas during the observations. The most striking preference, however, was that 16 of the 18 children favored dramatic play and that all children were involved in interactions in this area for some portion of the observations. This therefore reduced much of the data to comparisons of peer interaction in dramatic play. Dramatic play also requires the greatest conversational demands to negotiate participant roles and shared meanings. It appears that participation in this activity was desired by all children, yet when children with communicative limitations ventured in, they preferred the support of adult conversational partners to a greater degree than those with more advanced communication skills.

The obvious limitations of this study are the small number of subjects and the limited number of responses in some cells. Our strategy, however, has been one of buttressing several small-*N* studies via programmatic replication. Our on-line approach to data collection has allowed us to observe social integration and conversational participation in 31 speech- and/or language-impaired children enrolled in LAP over the last 3 years. To the extent that our findings have reappeared across samples, our confidence in the data has increased. Although our reliability may be somewhat lower than for coding based upon transcript data, this approach has allowed us to document global characteristics of a larger sample of children at the expense of more detailed analyses of only a few.

In summary, three characteristics of LI and SI children's peer interactions were significantly different from the children with age-appropriate language skills: (a) both groups were

less likely to interact with their peers, (b) both groups were more likely to be ignored by their peers, and (c) both groups were less likely to respond to the interaction attempts of their peers (and adults). There were no group differences in the total number of interactions, nor were there differences in conversational turns when adult-child interactions were included.

The implications for intervention are somewhat sobering. It seems that placement of these children in an integrated setting, even one in which adults are highly responsive to and encourage the children's initiation attempts, does not necessarily ensure peer interactions. It could be argued that the responsiveness of the adults encouraged children's reliance on them and therefore contributed to the greater probability of initiations toward adults. Two observations counter this argument. First, the adults in LAP were responsive to all the children and therefore their responsiveness did not account for group differences. Second, although this factor was not measured in this study, the LAP teachers encouraged the SI and LI children's attempts to initiate to their peers. There is, undoubtedly, much to be learned about the way in which teachers' responsiveness does or does not influence young children's interactions with their peers.

It is our impression that, without adult assistance, interactions between LI and SI children and their peers are tenuous. In this study, when LI and SI children initiated to their peers they were often ignored, and when peers initiated to them, the LI and SI children often did not respond. Like children with developmental delays or hearing impairment, the LI and SI children remain on the edge of their preschool peers' social interactions (Guralnick, 1990; Levy-Shiff & Hoffman, 1985).

Given this picture, it is unlikely that success in social interactions with peers can be established by focusing on an individual SI or LI child alone in interactions with an adult, as in traditional one-to-one language therapy. The problem goes beyond a child's limited communication skill per se to implications for the interactive dynamics of long-standing conversational settings. There is a possibility of a negative interactive spiral generated by a child's history of communicative failure wherein a child becomes less likely to respond as he or she experiences failure in peer interactions and peers become less likely to attend to the child's initiations. One consequence of such a negative spiral is participation in proportionally fewer interactions with peers, an outcome that further deprives a child of the interactive experiences that could generate greater skill (Rice, in press).

Central to overcoming the social consequences of a child's communicative limitations is recognition of the apparently well-tuned sensitivity to relative communication ability that even young children demonstrate. Preschoolers behave as if they know who talks well and who doesn't, and they prefer to interact with those who do. Therefore, placement of communicatively impaired children in an integrated setting, with normal-language peers and facilitative adults, will not in and of itself establish successful peer interactions in spontaneous interactions. Peers do not possess the same sensitivity or sense of obligation as adults when responding to LI and SI children.

Successful language intervention will require enhancement of the communicative success of children with communication impairments in conversational interactions with their normally developing peers. Strategies designed to help these children overcome initial barriers to peer interactions and increase the likelihood that these interactions will be maintained ought to be fundamental goals for language intervention in integrated classroom settings. These strategies must be based on an understanding of the social interactions of children in general as well as on an appreciation of the particular contribution of communicative competence.

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Appendix

Hierarchy and Definitions of Codes

- I. *Identifying variables*
 - A. Subject—**name** of target child.
 - B. Group—determined by child's performance on speech and language assessment battery at the beginning of the semester.
 1. **normal**
 2. **marginal**
 3. **language impaired (LI)**
 4. **speech impaired (SI)**
 - C. Date—calendar **date** of observation.
 - D. Round—observation **number**.
 - E. Block—**number** of the corresponding block within the coding period.
 - F. Time—**time** at the beginning of each block.
 - G. Area—**area** in which the interactions take place as the child moves about the room.
 1. **dramatic play**
 2. **art table**
 3. **quiet area**
 4. **block area**
 - H. Ratio—**number of children:adults** in the area where the target child is at the beginning of the block and after the first, second, and third minutes elapse.
 - I. Partner—**name** of the teacher or peer involved in the interaction with the target child; **general** if the child initiates without directing the utterance toward a specific partner.
- II. *Interaction attempts*
 - A. Initial—**(I)**—target child initiates a verbal interaction with a teacher or peer, or partner initiates to the target child.
 - B. Repeat—**(R)**—target child attempts to initiate another

interaction with the same partner immediately following an unsuccessful attempt.

III. *Responses*

- A. **Successful**—target child or partner's interaction attempt or response elicits the next turn in the interaction.
 1. **Prompt—(P)**—the turn is in the form of a direct question or command which obligates a response from the partner.
 2. **Acknowledge—(A)**—the response fulfills the requirement for a conversational turn; may be either verbal or nonverbal.
- B. **Unsuccessful**—target child or partner's interaction attempt or response does not elicit the next turn.
 1. **No response—(NR)**—target child or partner attends visually/auditorily to the turn directed to him but does not respond.

2. **Ignore—(Ig)**—target child or partner does not attend to the previous turn.

IV. *End of interaction*

- A. **Appropriate (X)**—termination of interaction is dependent upon mutual agreement of both partners.
- B. **Inappropriate (-)**—termination of interaction is the result of **no response** or **ignore** from the partner addressed.
- C. **Other**
 1. **Interruption (°)**—the speaker's turn is interrupted by an external factor (e.g., partner walks away, another child distracts partner, demands in environment distract partner).
 2. **Engaged (E)**—partner engaged in previous interaction, therefore response directed to target child would inappropriately terminate the current interaction.