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Social Interactions of Speech- and Language-Impaired Children

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Social interactions among preschool children were classified into four groups according to language ability: normally developing English, specific language impairment (SLI), speech impairment (SI), and English as a second language (ESL). The children were observed in naturalistic classroom interactions on three occasions. Conversational turns were coded according to initiations and responses, and addressee. The results reveal differences across the groups of children. Normal language peers initiate interactions with each other and have a higher percentage of longer responses; normal language peers were the preferred addressee in peer initiations. In contrast, children with limited communication skills were more likely than their normal language peers to initiate with adults and to shorten their responses or use nonverbal responses. ESL children were the least likely to initiate interactions and were the most likely to be avoided as the recipient of an initiation. The findings are interpreted as evidence that preschool children are sensitive to relative communication skills and make adjustments in their social interactions accordingly. Multiple contributing factors are implicated, including intelligibility, limited linguistic flexibility, limited discourse skills, and self-consciousness about communicative competence.

KEY WORDS: social interactions, language impairments, speech impairments, second language learners, child language

Language-impaired children have been described as poor communicators, relative to their normal peers[1] (e.g., Fey, 1986). On a number of pragmatic measures, such as clarification responses and the use of cohesive discourse devices, language-impaired children perform below their age peers, on a level more like younger language-matched peers (Lahey, 1988). These children are often seen as being less responsive and less able to maintain a conversation with their peers. To the extent that their discourse skills are limited, children with language impairment would be at risk for social interactions with their normal peers in integrated preschool settings.

Recent work with normally developing children links communication skills to children's social status. In particular, connectedness of discourse is a skill that has been associated with the social popularity of preschool children. In a study by Hazen and Black (1989), liked children were more inclined to clearly direct their initiations to specific listeners, to speak to both interaction partners rather than just one, to respond contingently to others, and to acknowledge others. In a follow-up study, Black and Hazen (1990) explored the interactions of acquainted and unacquainted preschoolers. They report that when entering the play of children they did not know, disliked children were less responsive to peers and more likely to make irrelevant comments than were liked children.

[1]In the interest of clear prose, the terms *normal peers* and *normal-language peers* will be used throughout as a shorthand term for "age-appropriate mastery of English as a native language."

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The contribution of communication skills to social acceptance is also implicated in reports of limited social interactions between children with other handicapping conditions and their normally developing peers. Guralnick (1980) and his colleagues (Guralnick & Groom, 1985, 1987; Guralnick & Paul-Brown, 1989) have studied the peer relations of children with mental retardation and nonhandicapped preschool children in mainstreamed playgroups. Based on analyses of a variety of discourse measures, over several studies, Guralnick (1990) concludes that "handicapped children form a socially separate subgroup in preschool settings. In general, nonhandicapped children tend to interact far less frequently with handicapped children than they do with other nonhandicapped classmates" (p. 287). He then goes on to state that "handicapped children are perceived as being of lower social status and are treated accordingly as reflected in speech style analyses" (p. 294).

As Guralnick points out, in the case of children with mental retardation, it is not easy to identify a single source of the social difficulties. The social interaction differences may be related to these children's cognitive or social skills deficits, or an interaction between the two, as well as the children's particular limitations with interactive speech and language skills. Physical differences for some of the children, which can serve as visual cues of an individual child's handicapped status, are another possible factor.

Similar problems with social interactions have been documented for hearing-impaired children. Vandell and George (1981) report that although deaf preschoolers were persistent initiators in interactions with a normal peer, they encountered interaction difficulties. Their initiation attempts were more likely to be actively refused than those of their hearing counterparts.

Parallel evidence documenting the social interactions of children whose only problems are speech and/or language impairments in naturalistic interactions with their peers has not been reported. Given the recent interest in naturalistic language intervention environments (cf. Norris & Hoffman, 1990), evidence of social interaction patterns would have immediate clinical relevance. It was the purpose of this study to provide such evidence by describing the social interactions of children in an integrated preschool language-intervention setting.

The particular integrated preschool setting in the study also allowed for inclusion of another group of children with limited English (i.e., children learning English as a second language: ESL). In a recent doctoral dissertation, Tabors (1987) reports that ESL children attending nursery school were ignored by their first language peers for the first several months and communicated primarily with the adults in the classroom. This suggests that the ESL children are an informative comparison group. They have a history of successful communication and are not regarded as handicapped. Therefore, any similarities between speech/language-impaired children and the ESL children are more likely to represent the effect of limited communication skills instead of otherwise unidentified personal factors.

As in the work of other investigators (Black & Hazen, 1990; Hazen & Black, 1989; Lederberg, Chapin, Rosenblatt, & Vandell, 1986; Lederberg, Rosenblatt, Vandell, & Chapin, 1987; Vandell & George, 1981), the targeted variables are initiations and responses. These variables are conversational moves that are sensitive to the interface of verbal and social abilities. In order to initiate successfully, a child must have a good sense of when to approach another child, be able to negotiate joint attention, and find an appropriate way to talk about something. Initiations are indices of social assertiveness, whereas a disproportionate number of responses would indicate a passive social role.

The distinction between initiations and responses is similar to Fey's (1986) proposal that language-impaired children could be classified along the dimensions of assertiveness and responsiveness. He used a variety of conversational acts for determining clinical profiles of children, including such measures as types of requests, types of assertions, types of responses, and moves to initiate or maintain topic.

In this study the intent was to describe patterns of general conversational moves, at the level of conversational turn, that might differentiate groups of children. Assertiveness and responsiveness were regarded as complementary aspects of conversational competence, thereby reducing Fey's (1986) two dimensions to one. Each turn a child took in an interaction was coded as a type of initiation or response (following the conventions of Lederberg et al. 1986; Lederberg et al., 1987; and Vandell & George, 1981). The higher the proportion of initiations, the greater the presumed assertiveness.

With regard to responsiveness, we were interested in the manner in which children maintained verbal interactions. Children may add substantively to the discourse, or they may use response strategies that allow active participation but add minimally to the subject matter. In this study, both one-word and nonverbal responses were interpreted as a limited response strategy. A high proportion of limited responses implies a reluctance to hold the conversational floor. Limited responses differ from previously described *back channel behaviors* (e.g., *mm-hmm, yeah,* or head nods and shakes) (Duncan, 1972; Duncan & Niederehe, 1974; Fey, Leonard, & Wilcox, 1981) that signal attentiveness to the ongoing discourse but are not considered to be conversational turns.

The three parameters of particular interest to this study were (a) the children's willingness to initiate an interaction, (b) the specific addressee of these initiations (peer vs. adult), and (c) the type of response used to mark a conversational turn. We predicted that the children with communicative limitations would demonstrate interactive patterns different from those of their normal-language peers, with fewer initiations, especially toward their peers. In addition, it was expected that children with communicative limitations would use fewer multiword verbal responses to seize the conversational floor and maintain verbal interactions.

Method

Subjects

The subjects in the study were 26 children who were enrolled in the Language Acquisition Preschool (LAP) at the University of Kansas. The children were in two classes of 13

each. All children demonstrated normal intelligence as indicated by performance on the Kaufman Assessment Battery for Children (K-ABC), (Kaufman & Kaufman, 1983). None had a physical or visual handicap or a hearing loss, as determined by regular hearing screenings conducted by the certified staff audiologist. Hearing was screened at 20 dB HL (ANSI, 1970) at 250, 500, 1000, 2000, and 4000 Hz in both right and left ears.

Children were initially enrolled in LAP in one of four language groups according to their performance on a battery of tests and descriptive language measures. The four groups were (a) models developing language normally (b) specific language-impaired (SLI) children, (c) speech-impaired (SI) children, and (d) ESL children. The language measures in the test battery included the Peabody Picture Vocabulary Test–Revised (PPVT-R), (Dunn & Dunn, 1981), the Reynell Developmental Language Scale–Revised (Reynell, 1985), and the Goldman-Fristoe Test of Articulation (Goldman & Fristoe, 1969), a spontaneous language sample used to obtain a mean length of utterance (MLU) and mastery of grammatical morphemes. Of the 26 children, 9 were normal-language models, 6 were SLI, 3 were SI, and 8 were ESL. Both classes contained an approximately equal number from each of the four groups. The children ranged in age from 39 to 67 months with mean ages for each group as follows: normal language models, $M = 54$; SLI, $M = 58.6$; SI, $M = 51.6$; and ESL, $M = 48$.

Children serving as normal-language models were required to score within normal limits on all standardized measures, possess an MLU within the predicted range for chronological age (Miller, 1981), and use age-appropriate grammatical morphemes (de Villiers & de Villiers, 1973). Upon initial enrollment in LAP, SLI children were required to meet at least two of the following criteria: (a) score below one standard deviation on the PPVT-R, (b) score below the 25th percentile on the receptive portion of the Reynell, (c) possess an MLU below the 16th percentile for chronological age (Miller, 1981), or (d) lack mastery of at least two age-appropriate grammatical morphemes (de Villiers & de Villiers, 1973). Children were classified as SI if they (a) met the SLI criteria described above, (b) scored below the 16th percentile on the Goldman-Fristoe (1969), and (c) had limited intelligibility in conversational speech. Although the subdivision of the communicatively impaired children into two groups reduced the number of subjects per group and, therefore, the available statistical power, there was reason to suspect that the more limited intelligibility of the SI children could influence social interactions in somewhat different ways than the limitations of the SLI children. Although some SLI children demonstrated speech errors, most were developmentally appropriate and characterized by typical sound substitutions. These errors did not reduce conversational intelligibility in the same way as the errors of the SI children.

Each SLI and SI child's test performance is reported in Tables 1 and 2. Two times of measurement are reported. Fall test scores were used for group classification purposes. Table 2 presents test scores obtained in the spring semester concurrent with data collection, documenting gains in language abilities during LAP enrollment. For some children, test scores document status in the second year of LAP enrollment. Their scores demonstrated improvement in their communication skills from the time of initial enrollment in the program, although they still met the established criteria. In addition, by the end of the spring semester all children had comprehension skills that were within normal limits on the PPVT-R and receptive portion of the Reynell.

The ESL children were selected to be as young as possible at the time of initial enrollment with no previous exposure to the English language. The children's native languages included Chinese, Japanese, Korean, Spanish, and Urdu. Normal first language acquisition was confirmed by parent report. Singletons or firstborn ESL children were preferred so that school-age siblings did not affect language learning. All ESL children tested within the normal range of intelligence in their native language on the K-ABC. Testing was conducted in the child's native language. There was considerable variability in English skills across the 8 ESL children. Four newly enrolled children had very little spontaneous English, whereas 4 children who had attended LAP for an average of three semesters prior to data collection had better English skills. For these children, their receptive skills were near normal on the PPVT-R and the Reynell, but their expressive repertoires were still limited.

TABLE 1. SLI and SI children's test battery scores: fall semester.

Subject	Sex	Group	K-ABC[a]	Age (yrs:mos)	PPVT[b]	Reynell[c]	G-F[d] (%)	MLU[e] #	MLU[e] %	Grammatical morphemes[f]
1	M	SLI	90	5:7	76	−0.2/−0.5	15	4.18	11	5/14
2	M	SLI	92	4:9	58	−1.5/−2.2	47	3.60	6	6/14
3	M	SLI	100	3:8	97	0.0/−0.9	15	3.51	25	0/5
4	M	SLI	96	5:3	92	−0.5/−1.6	13	2.59	1	0/14
5	F	SLI	100	4:1	73	−0.2/0.0	58	3.86	22	3/10
6	M	SLI	100	not enrolled						
7	F	SI	96	3:10	106	1.3/0.3	6	2.20	2	4/10
8	F	SI	112	4:9	100	1.4/−0.8	3	3.44	5	5/14
9	F	SI	96	not enrolled						

[a]Kaufman Assessment Battery for Children Mental Processing Composite standard score; $M = 100$, $SD = 15$. [b]Peabody Picture Vocabulary Test standard score; $M = 100$, $SD = 15$. [c]Receptive/Expressive standard scores; $M = 0$, $SD = 1$. [d]Goldman-Fristoe Test of Articulation percentile rank. [e]Mean length of utterance and percentile rank calculated according to the Miller (1981) conventions. [f]Number mastered, following de Villiers and de Villiers (1973) criteria of 90% correct use in obligatory context; denominator reflects number of morphemes expected for that age.

TABLE 2. SLI and SI children's test battery scores: spring semester.

Subject	Sex	Group	K-ABC[a]	Age (yrs:mos)	PPVT[b]	Reynell[c]	G-F[d] (%)	MLU[e] #	MLU[e] %	Grammatical morphemes[f]
1	M	SLI	81[g]	6:1	88	−0.7/−2.0	20	5.17	35	10/14
2	M	SLI	92	5:3	85	−0.9/−2.3	56	4.65	20	7/14
3	M	SLI	100	4:3	105	0.2/0.0	54	3.61	14	6/10
4	M	SLI	96	5:9	94	−0.2/−1.4	28	5.06	32	4/14
5	F	SLI	100	4:6	85	0.1/0.6	NA	3.98	16	4/14
6	M	SLI	100	3:6	88	1.2/−0.3	37	3.46	35	2/5
7	F	SI	96	4:3	107	NA	6	NA		NA
8	F	SI	112	5:3	100	1.1/−0.5	34	5.48	45	NA
9	F	SI	96	3:5	95	−0.2/−2.5	1	2.10	1	3/5

Note. NA = scores not available.
[a]Kaufman Assessment Battery for Children Mental Processing Composite standard score; $M = 100$, $SD = 15$. [b]Peabody Picture Vocabulary Test standard score; $M = 100$, $SD = 15$. [c]Receptive/Expressive standard scores; $M = 0$, $SD = 1$. [d]Goldman-Fristoe Test of Articulation percentile rank. [e]Mean length of utterance and percentile rank calculated according to the Miller (1981) conventions. [f]Number mastered, following de Villiers and de Villiers (1973) criteria of 90% correct use in obligatory context; denominator reflects number of morphemes expected for that age. [g]Subject 1 had an entry K-ABC score of 90. Differences between entry and exit testing appear to reflect scores within the standard error of measurement.

Setting

All children attended the Language Acquisition Preschool (LAP) at the University of Kansas. LAP is designed to provide language facilitation to all children in a classroom setting. It can be described as a least restrictive environment, with a naturalistic, child-driven curriculum adapted from the social/cognitive High Scope model (Hohmann, Banet, & Weikart, 1978). (See Rice & Wilcox, 1990 for summative evaluation; Rice & Wilcox, 1988, and Bunce, Watkins, & Hadley, 1989, for further description.) The adults in the classroom included a combination of the classroom teacher (a certified speech-language pathologist), the classroom aide, speech-language pathology student clinicians, and interpreters. The clinicians provided speech and language intervention in the classroom to the SLI or SI children, and the interpreters served as "special friends" for the ESL children. Although the student clinicians and interpreters provided services to specific children, they were instructed to include all children in their activities during the 40-min play center time. At this time, children were free to play in any one of four areas in the classroom: the quiet area, where activities consist of books and puzzles; the block area, supplied with blocks and trucks; the art table, providing cut, color, and paste activities; and dramatic play, a pretend play area where children act out different themes each day. All data were collected during this play center time.

Procedure

On-line observational data were collected according to procedures developed for the Social Interactive Coding System (SICS), (Rice, Sell, & Hadley, 1990). SICS allows an observer to follow a "5-minute-on, 5-minute-off" format in which all social interactions within the first 5-min segment are recorded continuously. The purpose of SICS is to capture the pattern of initiations and responses in social interactions. To that end, SICS was designed as an on-line coding system to provide an indication of a child's social assertiveness in a relatively short amount of time. The on-line nature of SICS provides clinicians with a fair amount of clinically relevant information about social interactions that supplements the information they obtain from standardized language assessments. Given this focus, the variables included in SICS are (a) *play activity* or the play area (e.g., dramatic play) the target child occupies; (b) *addressee*, or whom the child talks to; (c) *verbal interactive status* (VIS), which provides an index of general assertiveness as measured by initiations versus responses; (d) *script code*, or the specific play activity of the target child (e.g., puzzles); (e) *play level*, which measures the child's relationship to other children in the room; and (f) *language used*, which is necessary for coding the ESL children. (See Rice et al., 1990, for complete definitions of each category.) The variables of interest in this study were the addressee and the VIS codes (see Appendix for definitions).

Two trained observers collected data during the 40-min play center time for each child on three occasions. On the average, one target child was observed per session. One observation for each child was completed before the second and third rounds of data collection began. The three rounds of observations were collected over a 4-month period from late fall to early spring. Approximately 60 min of observational data were collected for each child.

The observers were able to move throughout the classroom unobtrusively because the children had become accustomed to their presence during the piloting phase. Observers did not participate in any of the play activities and discouraged the children from interacting with them. Observers recorded each of the target child's turns (e.g., initiation, verbal response) on a coding sheet. Other variables were recorded only as their status changed.

Training and Reliability

Data collection followed an extensive development and training period on SICS. Two observers piloted and revised the coding system in the classroom over a 3-month period. Once initial coding procedures and definitions were established, the two observers refined the coding system during a videotape training phase. Overall reliability during this phase was 95%.

After training with the videotapes, both observers participated in a classroom training phase, coding the interactions of randomly selected target children on 10 occasions. Interrater reliability for classroom observations of a target child was calculated on the data collected during the final session. Ninety-one percent of all interactions were coded by both observers. The reliability was 97% for the addressee category and 86% for VIS. The overall reliability was 92%. The major source of disagreements for the verbal interactive status involved the determination of interaction boundaries. One observer felt that a shorter pause time reflected the end of an interaction. Her observations consequently reflected more initiations, whereas the second observer coded the same turns as responses within an ongoing interaction. For further information about the training procedures and reliabilities, interested readers should refer to Rice et al. (1990). All data for the current study were collected immediately following training.

Results

The three rounds of data collection were combined, for a total of about 60 min of observational time per child. The overall frequency of interactions across the four groups differed [$F(3,22) = 3.54$; $p < .05$]. The means and standard deviations for total interactions per 5-min segment were as follows: normal language: $M = 9.31$, $SD = 2.67$; SLI: $M = 10.24$, $SD = 2.25$; SI: $M = 8.76$, $SD = .38$; ESL: $M = 6.58$, $SD = 1.99$. Post hoc Scheffé tests did not reveal significant pairwise contrasts between groups. The average length of interaction in turns and standard deviations were as follows: for normal-language children, $M = 1.94$, $SD = .30$; for SLI, $M = 1.73$, $SD = .24$; for SI, $M = 1.58$, $SD = .24$; and for ESL, $M = 1.93$, $SD = .45$. These differences were not significant.

The patterns of verbal interaction, however, varied across the four groups. Three parameters of interaction were explored. The first was a child's willingness to initiate a verbal interaction, or the choice between initiation and response. The groups varied in the total number of initiations. The means and standard deviations for initiations per 5-min segment were as follows: normal language: $M = 6.64$, $SD = 2.59$; SLI: $M = 6.68$, $SD = 2.28$; SI: $M = 4.17$, $SD = 1.03$; ESL: $M = 3.25$, $SD = 1.17$, with an ANOVA [$F(3,22) = 5.23$, $p < .01$]. Posthoc Scheffé tests indicated that normal language models and SLI children initiated significantly more often than ESL children.

The second parameter examined the addressee of an initiation. Pairwise tests of significance of difference (Bruning & Kintz, 1977) indicated that normal-language models directed a higher proportion of their initiations to peers (51%) than did SLI (36%), SI (37%), or ESL (37%; all $z > 2.86$; $p < .05$). The children with limited communication skills directed a higher proportion of initiations to adults. A further examination of the nature of these peer initiations indicated that normal models were the preferred partner for all children in the preschool, regardless of language level.

The actual number of initiations with children of specific language groups was compared to the probability of these initiations occurring by chance alone (Guralnick, 1980). Specifically, expected initiations to the four groups were calculated using the total number of initiations for each child and the proportion of children available in each group with whom that child could interact. For example, if 30% of the children in a given classroom were normal models and an SLI child initiated a total of 10 times to children, we would expect three initiations to be addressed to normal models on the basis of availability. Derived scores were then obtained for each child by subtracting the expected initiations from the actual initiations. Positive scores indicate initiations to a preferred group of children, whereas negative scores indicate a restricted number of initiations to a particular group. Scores approximating 0 indicate actual initiations at chance level.

Mean derived scores for actual initiations to each group were as follows: normal-language, $M = 3.73$; SLI, $M = 0.35$; SI, $M = -0.88$; and ESL, $M = -3.08$ (see Figure 1).

These scores indicated that initiations to normal children occurred above chance levels, whereas initiations to children in the other three groups were at chance levels (for the SLI and SI) or below (for the ESL children).

The third parameter explored the use of verbal versus limited responses (i.e., nonverbal, one-word) as a gross measure of the amount of verbalization used in formulating responses. (Because SICS is coded on-line, without transcription, finer description of verbal responses is not possi-

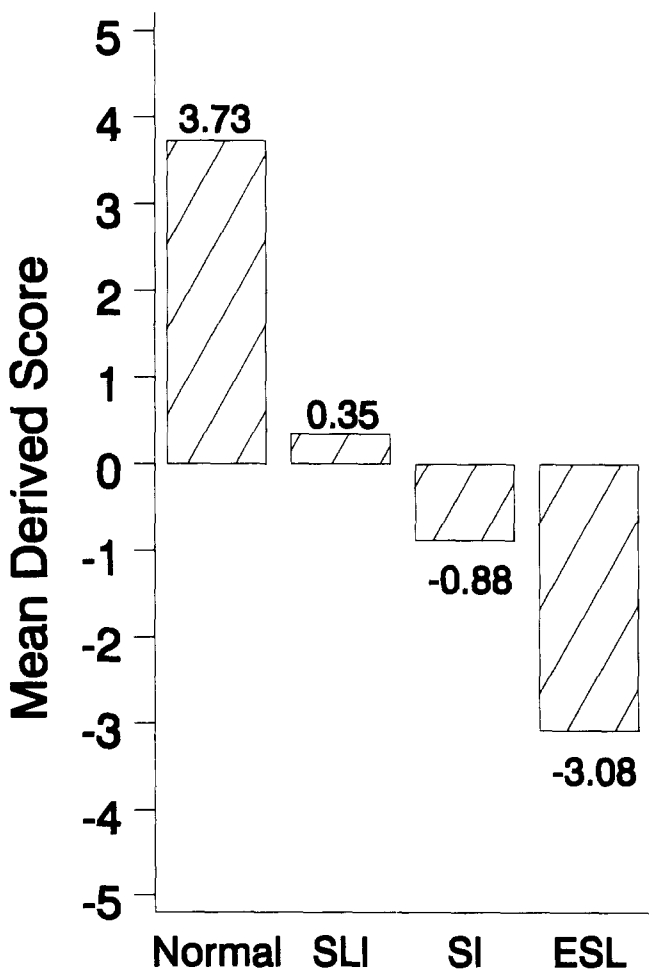

FIGURE 1. Mean derived peer preference score for peer initiations to each language group (scores approximating 0 indicate initiations at chance level).

TABLE 3. Percentage of responses by length and significant differences between them.

Response length	Language group			
	Normal	SLI	SI	ESL
Multiword verbal				
M	65.7	56.6	40.7	47.6
SD	10.1	8.6	4.0	18.4
One-word/nonverbal				
M	34.3	43.4	59.3	52.4
SD	10.1	8.6	4.0	18.4
Summary of significant differences				
Multiword verbal	N >	SLI	SI	ESL
		SLI >	SI	ESL
			SI =	ESL
One-word/nonverbal	N <	SLI	SI	ESL
		SLI <	SI	ESL
			SI =	ESL

Note. Significant differences for pairwise comparisons (all $z > 2.37$).

ble.) Limited responses were computed as the proportion of nonverbal/one-word responses to total responses. Table 3 provides the percentage of these response types and indicates significant differences between them, as determined by pairwise tests of significance of difference between two proportions (Bruning & Kintz, 1977).

Normal-language models used significantly more multiword responses than did the children in the other three groups (all $z > 3.00$). In addition, the SLI children used more multiword responses than did the SI and ESL children (z = 3.12, 2.37, respectively). On the other hand, the combination of one-word and nonverbal responses reflected the opposite pattern. The SI and ESL children used a similar proportion of one-word and nonverbal responses, although they relied on these limited responses more often than SLI children (z = 3.12, 2.37). All three groups used them more often than normal-language models (all $z > 3.00$).

In summary, the following group differences were significant. Normal-language models and SLI children initiated more frequently than the ESL children. Furthermore, the normal-language models were the preferred partner for all peer-directed initiations. For multiword responses, normal-language models were more likely to use these than the SLI children, whereas both normal-language models and SLI children were more likely to use these than the other two groups. For one-word and nonverbal responses, the opposite pattern was evident, with the SI and ESL children using this limited strategy more than half of the time, the SLI children somewhat less, and the normal-language models using a lower proportion than any of the three groups of communicatively limited children.

Discussion

The differences in patterns of social interaction among the groups of children in the Language Acquisition Preschool are relatively subtle but quite systematic. Neither the overall number of interactions, as defined by the SICS coding, nor mean length of interactions was sensitive to the interesting differences in the children's communicative competencies. This corresponds to the observations of casual observers: All children seem to be participating and interacting with each other and adults in the classroom during the activities available in play center time.

A closer analysis, however, reveals that the social interactions of preschool children are influenced by their facility with communication skills. The following adjustments are apparent:

1. Normal-language peers initiate interactions with each other and have a higher percentage of longer responses; normal-language peers were the preferred addressee in peer initiations in the classroom.
2. Children with limited communication skills are more likely than their normal-language peers to initiate to adults.
3. Children with limited communication skills, and especially those with speech impairments, shorten their responses or use nonverbal responses.
4. ESL children were the least likely to initiate interactions and were the most likely to be avoided as the recipient of an initiation.

Overall, the findings suggest that children are sensitive to their relative communicative competence, or incompetence, at an early age. As in other studies with developmentally delayed or deaf children, the children with limited communication skills were a social subgroup within the LAP classroom, even though it is an explicit goal of the classroom to encourage social interactions with a facilitative setting. What these data suggest is that as young as 3 years of age, children adjust their social interactions to take into account their communication abilities relative to those of others. The children who are developing language normally initiate to each other and serve as preferred partners.

It was not the case, furthermore, that the different pattern of social interactions was determined entirely by the normal-language peers. There were ample opportunities for the children with limited communication skills to initiate to their peers; presumably they chose not to, but instead directed a greater proportion of their initiations toward the adults. Likewise, the children chose to simplify their responses. In other words, the SLI, SI, and ESL children demonstrated social adaptations based on their own awareness of limited verbal abilities. At the same time, they preferred the normal-language models as social partners. Another possibility may be that both adults and normal-language models provided a greater likelihood for maintaining the interactions.

The greater proportion of adult-directed initiations could be viewed as a consequence of clinicians and interpreters directing more of their language to their target children. Although this is a possibility, the adults in LAP incorporated all children, regardless of their classification, into play activities during play center time in line with central goals of classroom-based models of intervention (Watkins & Bunce, 1991). For example, in the "fast-food restaurant" dramatic play, a triadic interaction can be engineered. The clinician (in the customer role) can provide verbal models for communicatively limited children by initiating to a peer (in the fast-food worker role) followed by scaffolding turns between the children themselves.

It is quite likely that the apparent self-recognition of the communicative limitations of the SLI, SI, and ESL children is due in part to the responses of their peers. If the other children do not respond to their overtures, or respond negatively, the communicatively limited children could quickly

learn to address their initiations to their teachers. The coding conventions of SICS do not include addressee responses. However, data from a follow-up study (Hadley & Rice, 1991), in which addressee responses were coded, indicate that SLI and SI children were more likely to have their initiations ignored than were their normal peers, and the SLI and SI children were less responsive to the initiation attempts of both peers and adults.

Another possibility is that initiation failure is due to particular linguistic or sociolinguistic limitations. We can speculate that several factors are at work. One candidate is that of limited intelligibility. The SI children were more likely than the other groups to shorten responses or use nonverbal responses, as well as to limit their initiations and direct their initiations toward adults. This pattern of reduced response length combined with initiations toward adults is quite reasonable if we assume that the adults were more willing than the peers to work at comprehending a youngster's utterances. Such conclusions, however, will require additional evidence, given the relatively small sample size of this group.

Another factor is suggested by the fact that ESL children's interaction patterns were similar to those of the SI children. Intelligibility was not as much of a problem for these children as was a limited repertoire, although there was considerable variability among the ESL children in English language competencies. The ESL children in LAP are often very shy about using their new language until they have had several months of experience and opportunities to develop comprehension skills, a phenomenon reported by others (cf. Tabors, 1987; Wong Fillmore, 1989). Therefore, some degree of self-consciousness is implicated by the findings as a factor contributing to differences in social interaction.

A third possibility is that the SLI and SI children may also be hampered by a limited range of linguistic structures, which in turn would interfere with the ability to generate sociolinguistic alternatives appropriate to the situation. For example, a child with a limited formal grammatical capability might not be able to shift from a simple demand "Give me that" to a more polite, and more complex, formulation such as one provided by Ervin-Tripp (1977), "If you give me this for a while, you can have this for a while" (p. 177). Yet such alternations are fundamental to interpersonal negotiations (Rice, 1984). A closely related possibility is that SLI children have limited discourse abilities that limit their participation in the give-and-take sequences of conversational turns. Evaluation of such possibilities will require close analysis of transcript data, in conjunction with SICS data.

The relatively intact comprehension skills of the SLI children at the time of data collection rule out the possibility that the observed differences were due to limited comprehension of an interlocutor's conversational move. Craig and Evans (1989) report that turn-taking skills appear less problematic for SLI children with adequate comprehension abilities. Therefore it is assumed that the children's basic understanding of conversational moves, such as initiation and response, was not impaired.

In conclusion, the one common feature of the three groups—SLI, SI, and ESL—was limited communication skill. On other dimensions, such as ethnic group, the SLI and SI children were similar to the normal-language peers. The ESL children were also distinctive because they, and their parents, spoke a non-English language. Also, the clothing and toys of the ESL children were sometimes noticeably different. On the other hand, the SLI, SI, and normal-language models were all drawn from the same general middle-class families of a relatively homogeneous small city. The feature that differentiated the SLI, SI, and ESL children from the normal-language models in the classroom was relatively limited verbal communication abilities. Therefore, we conclude that the communicative competence dimension influenced the children's social interactive patterns, although the underlying contributing factors appear to be multiple.

The limitations of this initial study of communicatively impaired children's interactions in a least restrictive environment are several, including the fact that a relatively small number of subjects were studied and observations were made in only one setting. Although these limitations are offset by a relatively large data set, further evidence is needed to determine the extent to which generalizations can be drawn.

Some support may be found in two subsequent studies. We have replicated similar findings across a second sample of teaching staff and children. Hadley and Rice (1991) replicate the finding that children with communication impairments (i.e., SLI, SI) participated in proportionately fewer peer interactions. Seven of 8 children in these groups were not subjects in the study reported here, increasing the overall subject pool to 10 SLI children and 6 SI children. Furthermore, a longitudinal study in progress indicates that as children with communication impairments, and in particular the SI children, make the transition into kindergarten classrooms, they continue to participate in proportionately fewer peer interactions and use proportionately fewer multiword verbal responses (Rice & Wilcox, 1991).

The potential clinical implications of these findings are significant. To the extent that experiencing success in social interactions is central to a child's sense of self-esteem and social role, children with communication limitations are at risk for the development of social competencies. Limited social interactions would in turn limit their opportunities to learn communication skills from their peers, especially in the development of discourse skills. Thus, these youngsters would be vulnerable to a negative spiral of social/communication failure beginning in the preschool years (Rice, in press).

Early intervention, therefore, should allow for supported opportunities for communicatively impaired children to interact with normally developing peers in naturalistic discourse settings. This conclusion is consistent with the requirement of P.L. 99-457 that services be provided in a least restrictive environment, that is, one with a maximal opportunity for enhancing a child's development, preferably in the context of normally developing peers. In such settings, speech/language pathologists will be able to observe social interactive patterns and employ scaffolding procedures as needed to maximize the probability of successful social interactions for children with communication impairments, in addition to those learning English as a second language.

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Appendix

Definition of Codes

Addressee

Record *name* of interlocutor so that later a distinction can be made between adult (teacher, interpreter) and child (normal-language model, language impaired, speech impaired, ESL); or, if the comment is to a general audience, record *general.*

Verbal Interactive Status

Initiation (**I**)—a verbal attempt by a child to begin an interaction with another person; a general verbalization directed to an unspecified addressee.

Repeat (**rep**)—repetition of verbalization to same addressee when first initiation attempt fails.

Verbal response (**R-V**)—multiword verbalization(s) following an interlocutor's utterance/turn.

One-word response (**R-V-1**)—one-word verbalization following an interlocutor's utterance/turn.

Nonverbal response (**R-NV**)—nonverbal behavior that serves as the child's turn within the interaction (e.g., head nods, smiles, gestures).

Ignore (**Ignore**)—interlocutor's verbalization is ignored.