COMMUNICATIVE SKILLS IN CHILDREN WITH SPECIFIC LANGUAGE IMPAIRMENTS: A COMPARISON WITH THEIR LANGUAGE-MATCHED SIBLINGS

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The purpose of this study was to compare the pragmatic skills of five children with Specific Language Impairments (SLI) and their Mean Length of Utterance-matched younger siblings, thus in part controlling for home language environment and expressive language level. Data were videotaped as mother-child free play in the home. Children's communicative acts were coded on three levels (social interchange, speech act, and conversational). Analysis of each level separately indicated generally comparable performance within sibling pairs. However, when the three levels were integrated into a measure of pragmatic flexibility, the children with SLI were found to demonstrate a more varied repertoire than their younger, normally developing siblings.

INTRODUCTION

In the past decade, there has been considerable evidence to suggest that the assessment of pragmatic skills is crucial to our understanding of the nature of language impairments (e.g. Roth and Spekman, 1984; Wetherby, Yonclas, and Bryan 1989; Leonard, 1986; Prutting and Kirchner, 1987). Further, it has been suggested that distinct diagnostic groups display different communicative profiles (Wetherby, Yonclas, and Bryan 1989; Prutting and Kirchner, 1987). Despite these claims, relatively few studies have examined the com-

municative functions displayed by children with Specific Language Impairments (SLI), and those studies have led to somewhat contradictory results and conclusions. Researchers interested in the communicative interactions of children with SLI have, for the most part, focused on one or more aspects of pragmatic functioning. Specifically, they have focused on the speech act level (e.g. the specific communicative intent that comes from within the speaker or motivates the act of speaking); the conversational level (e.g., speaker initiator or respondent roles); and the interactional level (e.g., ability to establish attention, maintain a joint focus, and regulate the behaviors of others).

Studies which focus on the speech act level have generally found that children with SLI are restricted in the range of speech acts they produce compared to chronologically matched controls, but are very similar to Mean Length of Utterance- (MLU-)matched younger children (Rom and Bliss, 1981; Leonard et al., 1982). However, Snyder (1978) found children with SLI to be deficient relative to younger normal-language (NL) children in their use of language to express declarative and imperative intent, while Ball, Cross, and Horsborough (1982) found children with SLI superior to linguistically matched children in terms of the number of requests produced.

Studies of the conversational level of pragmatic functioning have indicated that children with SLI play a somewhat passive role in conversational interactions. Specifically, children with SLI initiated conversation less often (Conti-Ramsden and Friel-Patti, 1983) and used a greater variety of conversational replies than their MLU-matched controls (Leonard, 1986). Furthermore, the linguistic abilities of the co-conversationalist had an impact on research findings. School-aged children with SLI were poor at strategies for initiating conversation and for repairing conversational breakdowns with age mates (Bryan, Donahue, and Pearl, 1981), while they were much more assertive in interactions with younger normally-developing children (Fey, Leonard, and Wilcox, 1981). Rice (1993) found children with SLI were more likely to initiate conversations with adults than with normally developing age mates. In addition, she found that children with SLI appeared to have difficulty achieving interpersonal agreement about the shared social context. Initiations made by the children with SLI were more likely to be ignored by their age mates and conversely the children with SLI were less responsive to initiations directed to them.

Rice's findings (1993) highlight the importance of investigating the socially constructed aspects of communication. Nonetheless, the analysis of the interactional level of pragmatic functioning, which emphasizes the social interchange, has rarely been studied in children with SLI (see Wetherby, Yonclas, and Bryan, 1989, for an exception). This may be attributed in part to the tendency to use coding schemes which collapse the interactional level into the speech act level of analysis (see Chapman, 1981; Ninio, et al., 1994, this volume, for a discussion of this problem).

Unfortunately, variations in the coding system and level of analysis utilized in previous studies, as well as methodological and theoretical problems with the approaches to coding employed, have contributed to the variety of results found for children with SLI (Chapman 1981; Wetherby, Cain, Yonclas, and Walker, 1988; Ninio, et al., 1984, this volume). First, many coding schemes either fail to distinguish explicitly between speech act, interactional, and conversational levels of analysis and/or blur the boundaries between these levels. Second, many of the taxonomies confound semantic and/or syntactic components of language skill with pragmatic functioning. And third, these schemes fail adequately to assess developmental changes in the pragmatic domain.

These three problems, inherent in research on pragmatic development in children with SLI as well as those developing normally, continue to contribute to differences among studies even when other factors such as modality of deficit (i.e. production, comprehension or both) and chronological age or linguistic stage have been controlled for. For example, a lack of distinction between the speech act, conversational, and interactional levels of analysis severely restricts the researcher's ability to integrate information from each of the levels, first individually, and then in combination. Further, use of coding systems which confound semantic and/or syntactic function with pragmatic skill may obscure whatever strengths or weaknesses in pragmatic skill children with SLI may have apart from their deficits in other subsystems of language. The third problem, lack of a developmentally sensitive tool, may desensitize the measurement of certain strengths of children with SLI. By using a taxonomy which restricts the subset of possible speech acts to those commensurate with particular syntactic or semantic levels of development, researchers may fail to detect possible strengths in the social interactional skills of children with SLI related to their normal nonverbal cognitive functioning. A coding scheme that taps variation in pragmatic skill over a wide developmental range is a necessary prerequisite for measuring pragmatic skill in individuals whose cognitive and language skills are mismatched.

The purposes of this paper were threefold. First we wanted to describe the pragmatic skills of children with SLI in comparison with their expressive language matched normally developing siblings. By comparing children with and without SLI from the same family, we can partially control for the language environment. Given the strong reciprocity and bidirectionality of influence in mother-child interaction found by Conti-Ramsden (1990), it is clear that completely controlling for language environment is extremely difficult. Nonetheless the current study offers distinct advantages over traditional designs in which children with SLI are matched with NL children from different families.

Second, in comparing the pragmatic skills of children with SLI with their siblings, we wanted to utilize a theoretically based and ecologically valid

system which redresses many of the problems described above (Ninio and Wheeler, 1984). And third, we wanted to evaluate pragmatic skills using two different approaches in order to determine which approach was more robust for detecting differences between children with SLI and those developing normally. The first approach compared the children with SLI with their normal language siblings by analyzing the speech act, conversational and itneractional levels of pragmatic skill separately. This first tactic is similar to previous studies which have concentrated on only one level of pragmatic skill. The second approach compared the children with SLI with their normal language siblings by combining the multiple levels of pragmatic skill into a single measure which we call Pragmatic Flexibility.

METHOD

Subjects

Five children with SLI and their five normally developing younger siblings drawn from a larger study of parent-child interaction (Conti-Ramsden and Dykins, 1990) participated in this study. The larger study had a two-stage screening procedure. First, families were contacted through a network of speech therapists and professional colleagues who were informed by letter of the criteria for participation. Second, during a home visit, each language-impaired subject referred was matched with his/her normally developing sibling on the basis of MLU. This MLU was obtained from an audiotaped language sample of each of the two children playing at home. By using children with SLI and siblings from the same family, all background variables including language of the home environment are controlled for. These stringent selection criteria, however, did have several ramifications. First, because of familial aggregation found in SLI (Tallal, Ross, and Curtis, 1989; Bishop and Edmundson, 1986), it is not often that one finds an older, cognitively intact child with SLI at the same expressive language stage as a younger, normally developing sibling. Only five out of the 36 potential participating families were included in the final sample. Second, the children with SLI in this study had severe expressive language deficits, reflected in the fact that their MLU fell far below age expectancies. Consequently, MLU-matched siblings for these children were very young. The severity of the expressive language delay makes this sample of children somewhat unusual for children with SLI.

   Subject characteristics may be found in Tables 1 and 2. All of the children functioned within normal limits on the Leiter International Performance Scale (Leiter, 1969). Interestingly, the children's language comprehension status varied depending on which aspect of comprehension was being measured. Table 2 gives the results of the three standardized comprehension

Table 1. Individual Subject Characteristics

Group	Subject	C.A.	MLU	MA	IQ
SLI	Sid	4;09	1.50	5;10	110
Sibling	Sue	2;05	1.25	2;03	98
SLI	Abe	5;03	1.92	5;09	115
Sibling	Ann	1;11	1.30	1;10	105
SLI	Clay	5;10	1.17	4;09	86
Sibling	Charles	2;04	1.42	2;00	91
SLI	Kate	4;09	1.95	4;03	95
Sibling	Kyle	2;04	2.05	2;03	101
SLI	Rick	6;09	2.22	6;06	108
Sibling	Rose	3;02	2.18	3;03	101

CA = chronological age; MLU = Mean Length of Utterance; MA = mental age measured by the Leiter International Performance Scale; IQ = intelligence quotient measured by the Leiter International Performance Scale.

tests. Results of the Preschool Language Scale (PLS-C) (Zimmerman, Steiner, and Pond, 1979), a developmental measure of language comprehension skills, revealed all children to be functioning within normal limits. Results of the receptive vocabulary test, the British Picture Vocabulary Scale (BPVS) (Dunn, Whetton, and Pintillie, 1982), revealed moderate-to-severe delays, whereas results of the Test of Receptive Grammar (TROG) (Bishop, 1982), a test of comprehension of grammatical structures, revealed normal-to--moderate delays. The siblings were not administered either the TROG or the BPVS because of their young age. A hearing screening determined that all subjects had normal bilateral hearing (at 500, 1,000, 2,000 hz at 25 Db), and there was no history of chronic otitis media. None of the children had a

Table 2. Individual Subjects Language Comprehension Scores

Subject	PLS-C score	PLS-C age	BPVS score	BPVS age	TROG score	TROG age
Sid	103	4;10	6%	2;10	50%	2;10
Sue	93	2;03	*a*		*a*	
Abe	105	5;06	26%	4;04	49%	5;00
Ann	131	2;07	*a*		*a*	
Clay	91	5;04	22%	4;07	20%	4;09
Chuck	98	2;04			*a*	
Kate	82	3;10	7%	3;00	*b*	
Kyle	91	2;01	*a*		*a*	
Rick	96	6;6	6%	4;06	50%	5;00
Rose	87	2;9	28%	2;08	*a*	

a = too young to be tested; *b* = did not reach lowest score; age = age equivalents; BPVS and TROG scores are percentile scores.

history of neurological or emotional problems. The five families participating in this study were white, and father and mother lived together at home. All were monolingual speakers of British English. All parents had at least a secondary education and none held university degrees. None of the mothers worked outside of the home.

Sampling Procedures

Each language-impaired child and younger sibling was videotaped at home interacting individually with his/her mother in a free play situation. In order to collect ecologically valid interaction data, the amount of structure imposed on the families' everyday activities was minimal. The videorecorder was not turned on until the participants were ready and playing comfortably. Each dyadic play interaction lasted approximately 15 minutes, of which the first 10 minutes was used for the current analysis. The order of interactions was determined by each family given everyday constraints such as school dismissal schedule, children's willingness, and so forth. In addition, each family chose the toys they wanted to play with and were instructed to "do what you normally do".

Transcription

An iterative process of videotape transcription was used in order to capture accurately the mother-child interactions. First, ten-minute samples of continuous play interaction were transcribed by two native speakers of British English using paper and pencil. Second, the paper and pencil transcripts were entered into a computer in accordance with the guidelines set out by the CHILDES system (MacWhinney and Snow, 1985, 1990; MacWhinney, 1991). Next, the transcripts were compared with the original videotaped data in order to verify their accuracy and to allow the addition of information on nonverbal communicative activity (e.g. gestures and gaze behaviors), broad phonetic information, and contextual information. Finally, the videotapes were viewed in conference by two of the authors. Any disagreements concerning the transcription were resolved by reexamination and a consensus was reached.

Coding and Analysis of the Transcripts

Pragmatic skill was coded based on both the full and abridged versions of the Ninio and Wheeler coding scheme (see Ninio and Wheeler, 1984; Ninio et al., 1994, this volume). Each speaker's communicative acts were coded

independently for three different levels of pragmatic intention. The first level, called the social interchange level, is analogous to the interactional level. Specifically, the social interchange describes the child's intention within the social context of an ongoing activity. For example, the child may be discussing a joint focus, directing the hearer's attention to objects or events, or negotiating the immediate activity, etc. The second level describes the specific communicative intent expressed by the speaker's utterance. This level is called the speech act level, and includes acts such as making statements, making requests, or answering questions. Please refer to Ninio et al., this volume, for a complete list of coding categories. The third level, derived from the full Ninio and Wheeler scheme, was the conversational level, which includes opening moves and responses to opening moves.[1]

In order to identify which of the two approaches better differentiated children with SLI from NL children, two sets of analyses were performed on the coded transcripts. In the first, the results of the different levels of pragmatic skill were considered separately in order to compare the current results with previous research findings. For these analyses, the following four pragmatic measures were generated for each child:

1. The absolute number of communicative acts in ten minutes. This number included all child communicative attempts including verbal, vocal, and nonverbal (e.g., pointing). This measure was designed to index the child's inclination to communicate.
2. The percentage of communicative acts that were opening moves, responses to opening moves, or ambiguous as to conversational function.
3. Percentage of total communicative acts in each of five categories: Directives, Statements, Commitments, Questions, and Other. Speech acts were aggregated to the level of pragmatic force because ten minutes of mother-child interaction yielded too few instances of individual speech act categories for the analysis to be quantitatively meaningful. The category Other included markings, speech elicitations, declarations, and evaluations, each of which were infrequently used by all ten children.
4. The social interchange level was measured as the percentage of total communicative acts in each of 22 interchange categories.

Because responsive communicative acts are highly dependent on the interlocutor's initial opening move, observed differences in responses at the levels of speech act and social interchange may reflect maternal differences

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[1] Ninio and Wheeler defined opening moves as "all moves which are not responses to or elaborations of previous moves." Responses are defined as communicative acts which answer questions, agree to or refuse a request, agree or disagree with a declaration, give in, etc. Communicative acts in the ambiguous category were typically uninterpretable due to unintelligibility or there was a mismatch between the verbal and nonverbal components of the message.

and not child differences. For this reason, responses were considered in the present study only at the conversational level of analysis and not for the speech act and social interchange levels of analyses.

In the second set of analyses, the conversational, speech act, and social interchange levels of pragmatic skill were combined to measure pragmatic flexibility. Pragmatic flexibility was measured as the number of different social interchange-speech act combination types. Thus, the number of different interchange-speech act-conversational combination types was taken as a measure of overall pragmatic flexibility. Similarly, the number of different social interchange-speech act combination types produced as openers was taken as a measure of the child's pragmatic flexibility within openers. The following examples taken from Sid's and Sue's transcripts help to illustrate the notion of pragmatic flexibility. Within Negotiate Immediate Activity (NIA), Sid used 12 different speech acts, whereas Sue used 10. In Sid's example, he tried to communicate "Dad, tell Mom that the toy is not put together correctly". Whining, he said:

  *SID: mom. that right.
                  (points to structure)
  *SID: that right.
  *SID: dada.
                  (motions towards DAD)
  *SID: that right.
  *SID: dada.
  *SID: that right. that right.
  %gpx: (shakes his head no)
  *DAD: no that's not right is it?
  *SID: no.

Although Sid's communicative attempts were constrained by his limitations in grammatical forms, he was persistent and used a variety of different speech acts within the NIA interchange: making statements, criticizing the hearer's actions, proposing suggestions, marking the completion of an activity, answering in the affirmative to a yes/no question, and calling. In contrast, his sibling Sue used fewer types of speech acts within the NIA interchange. In the following episode, Sue only makes statements and prohibits the mother from performing an action:

  *SUE: car.
                  (moves a car up the toy slide)
  *SUE: car fall down.
                  (walks the car down the other side of the slide)

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*SUE:    car.
*SUE:    fall down.
*MOM:    0.
             (MOM reaches in front of SUE takes the car and
                 places it on top of the slide)
*SUE:    no [=! whines].
             (takes the car from MOM and puts car on slide)
*MOM:    no.
*SUE:    all fall down.
             (accidentally knocks over slide).
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Reliability

Interrater reliability was determined separately for the speech act and inter-change levels. Two of the authors independently coded twenty percent of the total corpus of communicative acts. Interrater agreement as estimated by Cohen's Kappa was K = .87 for the speech act level and K = .84 for the interchange level.

RESULTS

Absolute Number of Communication Acts Per 10 Minutes

In this study, the mean number of communicative acts per 10 minutes was 123.8 (sd = 34) for the children with SLI and $\bar{X}$ = 106 (sd = 19) for the siblings. Two of the five children with SLI, Sid and Clay, produced approximately the same number of communicative acts in a ten minute sample as did their normal younger siblings (see Table 3). The other three children with SLI, Abe, Kate, and Rick, produced slightly more communicative acts per 10 minutes than did their siblings.

Conversational Level

In ten minutes, all ten children produced a high percentage of communicative acts classified as openers or responses, and a relatively low percentage of communicative acts classified as ambiguous (see Table 4 for categories). The mean percent of opening moves for the children with SLI ($\bar{X}$ = 47.2) and the mean percent of opening moves for the NL siblings ($\bar{X}$ = 46.1) were roughly equivalent as were the mean percent of responses (SLI $\bar{X}$ = 45.5,

Table 3. Number of Communicative Acts (CA's) and Percent of Communicative Acts (CA's) by Conversational Move

Group	Child	# CA's total	% CA's openers	% CA's responses	% CA's ambiguous
SLI	Sid	104	62.5	29.8	7.7
Sibling	Sue	102	58.0	32.3	8.8
SLI	Abe	163	39.0	48.5	12.3
Sibling	Ann	126	40.0	54.0	5.6
SLI	Clay	78	25.6	67.9	6.4
Sibling	Chuck	77	50.7	44.1	5.2
SLI	Kate	152	58.0	39.5	2.0
Sibling	Kyle	119	40.0	54.6	5.0
SLI	Rick	122	52.4	41.8	5.7
Sibling	Rose	106	42.0	40.6	17.9
SLI	Mean	124	47.2	45.5	6.8
	sd	34	14.5	6.3	3.7
Sibling	Mean	106	46.1	45.1	8.5
	sd	19	7.9	9.4	5.5

Sibling $\bar{X} = 45.1$). When individual sibling pairs were considered for openers (see Table 3), two of the children with SLI, Sid and Abe, produced approximately the same percentage of opening moves as their NL siblings, while Kate and Rick both produced a higher percentage of opening moves than their younger NL siblings. Of the five children with SLI, only Clay produced a lower percentage of openers than did his sibling (25.6% and 50.7%, respectively). When individual sibling pairs were considered for responses, three of the children with SLI, Sid, Abe, and Rick, produced approximately the same percentage of responses in conversation with their mothers as their siblings did. In contrast, Kate produced a lower percentage of responses than her sibling, while Clay produced a higher percentage of responses.

Speech Act Level

At the level of speech acts, the children with SLI looked very much like their younger NL siblings (refer to Table 5). The mean percentage of communicative acts for DIRECTIVES, STATEMENTS and QUESTIONS was roughly equivalent for both groups. The children with SLI, however, used a lower percentage of COMMITMENTS and a higher percentage of OTHER than did the NL siblings. When individual sibling pairs were considered, a few deviations from the group trend were noted. Specifically, Kate and Rick used slightly more DIRECTIVES, while Clay used fewer DIRECTIVES and OTHER compared to their NL siblings. Further, Abe used more STATE-

Table 4. Speech Act Categories by Major Pragmatic Force Categories

Openers	Responses
DIRECTIVES	DIRECTIVES
Call	Acknowledge
Counter suggestion	Agree for last time
Elicit completion of word/sentence	Agree to do
Elicit imitation	Complete rote text demanded
Elicit Onomatapoeic sounds	Give in
Re-run request	Give reason
Request/purpose	Refuse to do
Signal to start an activity	Repeat/imitate other
Yes/no question which functions as a suggestion	
Sentence completion	
STATEMENTS/	STATEMENTS/
DECLARATIONS	DECLARATIONS
Counting	Agree to declaration
Declare fantasy	Agree to proposition
Declare a new state of affairs	Disagree to declaration
Disapprove/protest hearer's behavior	Disagree to proposition
Express wish	Statements[a]
Statements[a]	
QUESTIONS	QUESTIONS
Aggravated question	Answer a wh–question
Eliciting question	Answer question with question
Limited alternative question	Answer in affirmative
WH–questions	Answer in negative
Yes/no question	Refuse to answer
COMMITMENTS	COMMITMENTS
Ask for permission	Permit hearer to perform act
State intentions	Prohibit/forbid hearer
Prohibit/forbid hearer to perform act	
Promise	
Threaten to do	
OTHER	
Markings[a]	
Mark transfer object to hearer[a]	
Commiserate[a]	
Exclaim in distress[a]	
Endearment[a]	
Exhibit attentiveness[a]	
Perform verbal move in game[a]	
Read text aloud[a]	
Praise performance[a]	
Exclaim in surprise[a]	
Disagree or protest actions of hearer[a]	
Point out error in nonverbal act[a]	
Approve of behavior[a]	
Disapprove of behavior[a]	
Exclaim in disapproval[a]	
Re-run request[a]	
Correct verbal error[a]	

[a] may be classified as either opener or response depending on the situation.

Table 5. Percent of Communicative Acts by Pragmatic Force

Group	Child	DIRECTION	STATE- MENT	QUESTION	COMMIT- MENT	OTHER
SLI	Sid	12.5	15.4	.96	5.8	19.2
Sibling	Sue	12.5	21.6	.98	8.9	14.7
SLI	Abe	4.9	14.7	1.23	5.5	9.2
Sibling	Ann	3.2	9.5	2.28	15.9	7.1
SLI	Clay	3.8	17.9	2.56	1.3	1.3
Sibling	Chuck	24.7	16.9	1.30	30.0	6.5
SLI	Kate	16.4	15.8	4.61	7.8	13.2
Sibling	Kyle	7.6	13.4	1.68	15.1	2.5
SLI	Rick	7.34	19.7	1.62	4.1	16.4
Sibling	Rose	3.78	16.0	1.89	9.4	12.3
SLI	Mean	9.0	16.7	2.20	7.4	11.9
	sd	5.3	2.1	1.5	5.2	7.0
Sibling	Mean	10.3	15.5	1.63	15.9	8.6
	sd	8.8	4.5	0.51	8.5	4.9

MENTS and Sid used slightly fewer STATEMENTS than their NL siblings. In summary, the children with SLI as a group looked similar to their NL siblings except for their less frequent use of COMMITMENTS.

Interactional Level

Finally, the percentage of total communication acts for INTERCHANGES was analyzed in order to capture the interactional level of analysis.[2] At the level of INTERCHANGE, the mean percentage of initiatory communicative acts (refer to Tables 6 and 7) was approximately the same for the children with SLI and their NL siblings in the following categories: Directing the Hearer's Attention (DHA), Discussing a Joint Focus of Activity (DJF), Discussing a Recent Event (DRE), Discussing Clarification (DCC), Negotiating Mutual Attention (NMA), Negotiating the Immediate Activity (NIA), and Negotiating Possession (PSS). A few deviations from the group trend were noted. Specifically, Clay used fewer DHAs and NIAs but more DJFs than did his sibling. Rick used more DCCs and more DHAs than his sibling. Sid used fewer DCCs, and Abe used fewer DJFs than their respective siblings.

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[2] Interchange categories which are infrequently used across all ten children were collapsed into an OTHER category. As with the pragmatic force categories, OTHER predominantly comprised MARKINGS.

Table 6. Percent of Communicative Acts in Discussion Interchange Types

Group	Child	DCC	DHA	DJF	DNP	DRE	DFW
SLI	Sid	1.92	3.85	0.00	0.00	0.96	2.88
Sibling	Sue	6.98	3.92	0.98	0.00	0.98	0.00
SLI	Abe	3.07	4.91	2.45	0.00	1.84	0.00
Sibling	Ann	1.68	2.38	7.95	0.00	0.00	0.00
SLI	Clay	1.28	3.25	11.54	0.00	0.00	0.00
Sibling	Chuck	0.00	6.49	6.49	0.00	0.00	0.00
SLI	Kate	0.00	5.92	4.20	5.26	0.84	1.32
Sibling	Kyle	3.17	4.20	5.26	0.00	0.66	0.00
SLI	Rick	4.92	4.92	2.83	0.82	0.00	0.00
Sibling	Rose	0.94	0.94	0.82	0.00	0.82	0.00
SLI	Mean	2.24	4.54	4.77	1.22	1.22	0.84
	sd	1.86	1.04	4.45	2.29	1.32	1.28
Sibling	Mean	2.55	3.59	4.49	0.00	0.84	0.00
	sd	2.77	2.08	2.78		1.06	

Further, the children with SLI as a group appeared to initiate using a higher proportion of Discuss Non-Present (DNP), Discuss Fantasy World (DFW), and Other (OTH) than did their NL siblings. It should be noted that only two of the children with SLI, Kate and Rick, engaged in interactions which Discussed the Non-Present (DNP), and that none of the NL siblings engaged in such interactions. Similarly, two children with SLI, Kate and Sid,

Table 7. Percent of Communicative Acts in Negotiations and Other Interchange Types

Group	Child	NIA	NFW	NMA	PSS	PRO	OTH
SLI	Sid	33.7	0.00	2.89	1.92	0.0	13.5
Sibling	Sue	21.5	0.00	0.00	0.00	16.7	6.9
SLI	Abe	11.0	0.63	0.61	0.00	4.3	3.7
Sibling	Ann	22.2	0.00	0.00	0.00	0.0	2.4
SLI	Clay	6.41	0.00	1.23	0.00	0.0	1.3
Sibling	Chuck	24.7	0.00	3.90	1.30	0.0	5.2
SLI	Kate	32.8	0.66	0.00	0.00	0.0	10.5
Sibling	Kyle	25.1	0.00	1.68	0.00	2.0	2.5
SLI	Rick	23.8	0.82	0.82	1.64	0.0	8.2
Sibling	Rose	17.9	11.3	0.00	0.00	0.0	2.8
SLI	Mean	21.5	.419	1.12	.71	.9	7.4
	sd	12.4	.39	1.1	.98	1.9	5.0
Sibling	Mean	22.3	2.26	1.12	.26	3.73	4.0
	sd	2.9	5.0	1.8	.58	7.3	1.9

Table 8. Pragmatic Flexibility for Openers and Overall

Groups	Child	For openers	Overall
SLI	Sid	24	40
Sibling	Sue	14	31
SLI	Abe	26	53
Sibling	Ann	17	43
SLI	Clay	9	27
Sibling	Chuck	17	31
SLI	Kate	26	57
Sibling	Kyle	16	37
SLI	Rick	25	53
Sibling	Rose	15	37
SLI	Mean	22	45.4
	sd	7.3	1.7
Sibling	Mean	15.8	35.8
	sd	11.8	5.02

engaged in Discussions of Fantasy World (DFW), while none of the NL siblings initiated interactions with their mothers in this way.

Finally, the children with SLI as a group appeared to initiate less often in interactions which negotiated the fantasy world (NFW) or which were routine performances (PRO). The former finding was attributable solely to Rose, the only sibling who initiated within negotiation of the fantasy world (NFW), and she did so in 11.3% of her communicative interactions.

Multiple-Level Analyses

Thus far, we have compared the children with SLI from the current study with their NL siblings in each of three component areas of pragmatic skill. Fully analyzing communicative intent, however, requires integrating the three levels of analysis (Chapman, 1981; Ninio et al., 1994, this volume). It is important not only to examine the individual strands of pragmatic skill, but to explore the synergism of individual strands in combination. One way of examining multiple levels simultaneously is to tabulate the number of different interchange-speech act combinations used by the child, first within openers and then overall. These measures we refer to as measures of *pragmatic flexibility.*

On average, the children with SLI used their componential pragmatic skills in more flexible ways than did their NL siblings (see Table 8). When individual sibling pairs were considered, Sid, Abe, Kate, and Rick all used a more varied repertoire of openers compared to their NL siblings, while only Clay did not. Similar findings emerged when pragmatic flexibility scores for

openers and responses were combined to yield a measure of overall pragmatic flexibility.

DISCUSSION

In this study we described the pragmatic skills of children with SLI in comparison with their NL younger siblings functioning at the same grammatical stage. That is, we attempted to hold the effects of the language environment relatively constant in order to compare the pragmatic skills of children with and without SLI functioning at the same expressive language level. In addition, we wanted to investigate different approaches to the assessment of pragmatic skills. The first approach compared children with SLI to their NL siblings when componential pragmatic skills (e.g. conversational, speech act, and social interchange) were analyzed separately, whereas the second approach compared the children with SLI to their NL siblings when the multiple levels of analyses were combined.

In terms of the conversational level, we found that four of the five children with SLI in the present study were no more passive than their NL younger siblings. Interestingly, this finding did not corroborate the previous research observations on the conversational level of analysis. The relatively high proportion of initiatory communicative acts by these children with SLI in this study may in part reflect the particularly large age gap between them and their MLU-matched counterparts.

The findings from the speech act level suggested that the children with SLI resembled their NL siblings in terms of the proportion of different speech acts used. This finding was in keeping with past research on the speech act level of pragmatic skill in children with SLI.

Finally, the findings from the interactional level suggested that children with SLI were remarkably similar to their NL younger siblings. There was some evidence, however, that the children with SLI engaged in a higher proportion of interactions which may be considered more demanding cognitively, such as Discuss Fantasy World (DFW), Discuss the Non-present (DNP) and Discuss a Recent Event (DRE). That is, using a developmentally sensitive coding scheme, we were able to tap variation in interactional skills which appear to change with age.

Using the first approach, the overall impression was one of parity between the groups. That is, the children with SLI in this study looked strikingly similar to their younger NL siblings when the conversational, speech act, and interactional levels of pragmatic skill were analyzed separately. Limiting consideration of results to separate pragmatic levels, however, attenuates the differences found when the various levels of pragmatic functioning are considered simultaneously. Specifically, when the conversational, speech act, and interactional levels of analysis were integrated into a measure of prag-

matic flexibility, the relatively small differences observed at the level of interchange assumed greater significance, because the children with SLI were better able to manage a variety of speech acts within these interchanges than were their younger NL siblings.

It should be noted that the number of communicative acts per ten minutes can be interpreted as the rate of communication. Others have found this measure to be associated with more advanced communicative skill (Wetherby, Yonclas, and Bryan, 1989; Miller, 1991). One could argue that the rate of communication is a more parsimonious measure than pragmatic flexibility. It should be remembered that pragmatic flexibility is achieved not by increasing the number of communicative attempts but by varying the repertoire of those communicative acts. For example, in our study, Sid looked very similar to his NL sibling when rate of communicative acts alone was considered. Nonetheless, his repertoire of communicative acts was much more varied than his NL sibling as demonstrated by both his overall pragmatic flexibility score and his pragmatic flexibility score for openers.

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