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Abstract: Investigates the nature and frequency of parental recasts to children with specific language impairment (SLI) as compared to normal language learning children of the same language stage including their younger siblings. Indications that children with SLI at the early stages of development experience a simple recast gap in their linguistic output.

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CONTINGENCY AND BREAKDOWN: CHILDREN WITH SLI AND THEIR CONVERSATIONS WITH MOTHERS AND FATHERS

The present study aimed to investigate the nature and frequency of parental recasts (both mothers and fathers) to children with SLI as compared to normal language learning children of the same language stage including their younger siblings. The comparisons were made within the framework of discourse function to include behaviors related to conversational contingency and conversational breakdown. Results showed that children with SLI at the early stages of development experience a simple recast gap in their linguistic input. Qualitative differences in the context in which recasts occurred were also noted. Furthermore, some differences between mothers and fathers were found. These findings are discussed in light of previous research with particular reference to the Rare Event Theory and the Bridge Hypothesis.

KEY WORDS: conversational contingency, conversational breakdown, specific language impairment, mothers vs. fathers

It seems surprising that just under 2 decades ago Lamb (1975) deemed fathers as "the forgotten contributors to child development." Since then research has established the competence and sensitivity of fathers with their young children (Hanson & Bozett, 1985; Lamb, 1986) as well as their significance as providers of linguistic input to their children (Mannie & Tomasello, 1987; Tomasello, Conti-Ramsden, & Ewert, 1990). For example, fathers may enhance the young child's communication development in different ways from mothers and therefore may be seen as linguistic "bridges" to the wider community of speakers outside the home environment. This position has been proposed by Gleason (1975) and is referred to as the "Bridge Hypothesis."

In spite of this growing body of literature, little attention has been focused on the fathers of children with specific language impairment (SLI). Children with SLI are characterized by having significant difficulties in the

production and/or comprehension of language in the absence of any hearing loss, cognitive delays, or emotional disorders (Bishop, 1992). As such, they raise highly interesting theoretical questions about the relationship between input and language development. On the one hand, children with SLI's physical development and often certain comprehension strategies provide cues that would elicit complex linguistic patterns from their conversational partners. On the other hand, children with SLI's expressive language output may be comparable to that of a much younger child. Children with SLI present a potential conflict for the adults with whom they communicate. Thus, what do we know of the quality of the verbal environment provided by parents when interacting with their children with SLI?

Research with mothers of children with SLI has shown, although not always consistently, that children with SLI experience a "recast gap" in their input. Specifically, Conti-Ramsden (1990) and Nelson, Welsh, Camarata, Butkovsky, and Camarata (1995) have found that children with SLI in Brown's (1973) Stages III-V of linguistic development receive fewer complex recasts than nonimpaired children of the same language stage. This finding is of particular importance given the numerous theoretical arguments for the importance of recasts as facilitators of children's syntactic progress (Baker & Nelson, 1984; Nelson, 1977, 1980, 1981, 1987; Nelson, Denninger, Bonvillian, Kaplan, & Baker, 1984). It is argued that the children's language processing must bring into active comparison the sentence structures already in the child's repertoire and particular sentences carrying more complex structures yet to be acquired. Recasts provide an ideal opportunity for these comparisons to take place and although they do not occur very often it is these "rare events" that may be responsible for specific advances in language. This position put forth by Nelson and his colleagues is referred to as the "Rare Event Theory."

On the other hand, there are only a few interactional studies concerning fathers and children with SLI. Cramblit and Siegel (1977), in their single case study of a child with SLI, found the father used a higher percentage of imperatives than the mother. Furthermore, Newhoff, Silverman, and Millet (1980), in their study of 18 families involving children with SLI and 18 families with normal language learners of the same language stage, found fathers as a group to be less semantically contingent than mothers. Schodorf and Edwards (1983) studied 20 families with SLI children and found fathers used fewer expansions than mothers and more information-seeking responses than mothers. Finally, Girolametto and Tanhock (1994) found fathers used more response control and topic control with their children than mothers did. This information is limited in scope and direct comparison with the literature on mother-child interaction is not forthcoming.

The purpose of this investigation was twofold. First, the present study aimed to compare the nature and frequency of parental recasts (both mothers and fathers) to children with SLI with recasts to normal language learning children of the same language stage. The comparisons were made within the framework of discourse function to include behaviors related to conversational contingency and conversational breakdown. It was desirable to include a number of contingent behaviors (i.e., recasts, continuations, imitations) in order to make comparisons with previous research (Conti-Ramsden, 1990) and to ascertain whether children with SLI receive less semantically contingent speech overall or whether there are specific types of contingent speech, for example, recasts, that may be problematic. In addition, conversational breakdown can be seen as the other side of the coin of contingency. Previous research with fathers (Tomasello et al., 1990) has suggested that fathers experience more breakdowns with their children than mothers do. Does this picture also apply to families with children with SLI? Thus, in its first aim the present study attempted to compare present findings with previous research and extend the scope of the question involving contingency/breakdown to include fathers of children with SLI. Second, the present investigation aimed to examine a natural but infrequently occurring situation where a family had both a child with SLI and a normal younger sibling of the same language stage. This approach involved comparing parental interactions with their children with SLI to the same parents'

interactions with their non-language-impaired children that may act as "controls." Furthermore, another group of normal language learning children of the same language stage was studied to provide a second control group. Thus, in our choice of methods, an attempt was made to allow for greater comparability with prior and future research results in this area.

Method

The Families

Families that could potentially participate in the project because they had one child with specific language impairment (SLI) and another normally developing younger child were informed of the research project through the speech and language treatment services in the northwest of England, and asked if they would be willing for the research workers to visit them to discuss their possible involvement in more detail. During this initial visit, the researchers collected language samples by means of an audio recording from the child with SLI and his or her younger normal language sibling (SIB). The first 50 utterances of the recordings were transcribed in order to ascertain whether the child with SLI and the sibling belonged to the same language stage using Brown's criteria with the modifications suggested by Miller (1981). From the outset, it was made clear that no identifying information would be revealed except to the research workers and that the family could terminate their involvement in the research project at any time. Any data collected from the family at that point would be destroyed if desired.

There was some difficulty in identifying families whose children fitted the strict criteria for the investigation. It was required that the child with SLI and his or her sibling were of the same language stage, and falling within the limits of Brown's Stage I and early Stage II. It was thought to be important that all children be in the same language stage so that comparisons could be made across children. An early stage of development was chosen because it is in the early stages of syntactic growth that maternal effects are believed to play a particularly important role (Nelson, Denninger, Bonvillian, Kaplan, & Baker, 1984). In addition, the present study aimed to extend to earlier stages of development the findings of Conti-Ramsden (1990) and Nelson et al. (1995) with Stage III-V SLI children. In addition, the study that was funded by the March of Dimes Birth Defects foundation required all children with SLI to have severe language impairment with eventful birth histories but cognitive abilities within normal limits. A total of 40 families were visited of which 6 fitted the above criteria and were used for this research project.

The control subjects were families with children who had similar mean length of utterance (MLU) measures to the SLI-SIB children. These families were recruited from local playgroups and parent-toddler groups. After parents had volunteered, an initial visit was made to the families in the same way as to the SLI-SIB families. Thus, a total of 18 children participated in the study: 6 children with SLI, 6 normal language siblings, and 6 control children.

Characteristics of the Children Participating in the Study

The characteristics of the children are presented in Table I in terms of age, sex, MLU, and psychometric results. Children with SLI ranged in age from 3:9 to 6:10 years, their siblings from 2:0 to 3:3 years, and the control children ranged from 1:10 to 3:1 years. With regard to sex, 5 out of the 6 children with SLI were male, 4 out of the 6 siblings were male, and 3 out of the 6 control children were male. As can be seen from Table I all children were matched for MLU (a maximum of .35 of a morpheme difference for each SLI-SIB-CONTROL triad) and, in addition, all children fell within Brown's Stage I/Early Stage II of language development (Brown, 1973). All children were functioning cognitively within normal limits as evidenced by the results of the Leiter International Performance Scale (LIPS). All children with SLI had severe expressive language deficits reflected in the fact that their MLUs fell far below age expectancies (Miller, 1981). As has been found before (Conti-Ramsden,

Donlan, & Grove, 1992), children with SLI presented with varied comprehension abilities in terms of vocabulary and grammar as can be seen from the results of these children on the British Picture Vocabulary Scale (BPVS) and the Test of Reception of Grammar (TROG).

In addition, all children had adequate hearing sensitivity as determined by pure-tone audiometry screening bilaterally at 500, 1K, 2K Hz at 25 dB (equivalent to pure tone thresholds of 25 dB HL, re: ANSI, 1989). The children with SLI all presented with eventful birth histories: 5 out of the 6 children with SLI were anoxic at birth. One of these 5 children required intensive care for 24 hours. The sixth child with SLI was jaundiced at birth and the mother had a difficult pregnancy with colic and infections that required treatment. Developmental histories ascertained by a questionnaire to parents revealed all developmental language milestones to be delayed in the 6 children with SLI. In addition, motor milestones appeared delayed in 2 of the 6 children with SLI.

Furthermore, all children spoke English in monolingual homes and came from intact (two parent) families. In the families with a child with SLI, all the mothers remained at home as housewives. For the control families, 3 mothers remained at home whereas the other 3 went to work. In the families with a child with SLI, fathers all had secondary education. For the control families, 2 fathers had secondary education and the other 4 had further education. All children with SLI were receiving speech treatment in a clinic or were enrolled in language-based classrooms for children with SLI (called "language units" in England).

Video Recordings

The video-recording sessions were conducted in the homes of the families using play material available from their homes such as jigsaws, Fisher-Price toys, books, Legos, and models. In order to keep parents as unconcerned as possible about the nature of their own speech, the parents were told that the research was primarily about children's communication development. The instructions given to parents were "play as you normally do."

Families of children with SLI participated in a number of dyadic interactions:

1. father-child interactions: father-child with SLI
father-sibling
2. mother-child interactions: mother-child with SLI
mother-sibling
3. child-child interactions: child with SLI-sibling

The families of control children also participated in the following dyadic interactions: father-control child, mother-control child, and control child-younger sibling. The present study only concerns itself with the mother-child and father-child interactions.

Because of the number of interactive alignments to be recorded and because the project also taped two conditions (play and book reading, although the present study only discusses the results of the play sessions), the researchers spent all day with the families and sometimes more than 1 day. All families had warm-up sessions where the researchers carried out testing of the children and when the equipment was set up for the children to explore and get used to. Thus, all children were seen at least for 1 day before video-recording started. The order of recording was not controlled for. It was the child with SLI or the sibling, depending on which of the children was available and ready to interact. For example, the mother-child interactions with the sibling were usually carried out during the day when the older child was at school. Father-child interactions were usually done in the evenings when fathers came home. The interactions were dyadic and no sibling was present while recording. Siblings and other members of the family were kept busy with activities in another

room of the house. Recording sessions lasted approximately 15-20 minutes. The researchers asked participants to begin to play and once the parents and children had settled, the video camera was turned on.

Transcription

The first 10 minutes of each of the video sessions were transcribed. The transcriptions involved recording verbal and nonverbal interactions and the context in which these events occurred. This was carried out in accordance with the guidelines produced by the Codes for Human Analysis of Transcripts (CHAT), which is part of the Child Language Data Exchange System (CHILDES) (MacWhinney, 1991). The computerized transcripts were then compared by an independent transcriber with the original videotaped data in order to verify their accuracy. This process resulted in 96.7% inter-transcriber reliability. Any disagreements concerning the transcription were resolved by re-examination and consensus was reached. The data from the present study are available from CHILDES.

Analysis

The first step in analyzing transcriptions was to organize the conversational data into turns using Kaye and Charney's (1981) definition of a speaker turn as a string of one or more utterances with or without accompanying gestures, or one or more nonverbal acts (e.g., pointing, head nodding, waving, etc.), strung together without a pause. Each turn was divided into utterances initially. Decisions regarding utterance boundaries were based on clausal syntactic units, intonation contours, and pauses. Clausal syntactic units formed the basic criterion for identifying utterances. In unclear cases, pause and/or intonation information was used to reach a decision. Once the transcripts were organized into utterances and turns, the following set of analyses were carried out.

Contingency Analysis

A set of contingent turns was termed a conversation (Conti-Ramsden & Friel-Patti, 1987) and defined as two or more turns linked together by a focus on a particular topic. Thus, a conversation had a beginning, some sort of continuation, and an end. The idea of a theme was used to guide the coding of conversations. As long as an interaction was following a particular theme and there were no indications of breakdown then it was regarded as being a single conversation. Indicators for breakdown are fully discussed in the next section but they included longer pauses (i.e., 5 seconds or longer) between utterances as well as changes in the focus or the item under discussion. The first step of the Contingency Analysis was to find all the conversations present in the transcripts. Once these were identified parental and child speech were analyzed.

Parental speech. The present analysis involved coding parental speech utterance by utterance as initiations, comments, imitations, simple recasts, complex recasts, requests for clarification, acknowledgments, and continuations based on the work of Conti-Ramsden (1990).

Children's speech. This coding scheme included responsive and interactive utterances. Responsive utterances were responses to direct questions and demands. Nonverbal compliance was also included in this category. Interactive utterances were spontaneous utterances that contained some elements that were not present in previous utterances and had not been requested. These utterances actively sought to move the conversation forward. Thus, interactive utterances included both initiations of conversations as well as turns within a conversation.

Finally, in the contingent analysis the category of "unclear" was used for all utterances by the child/parent that were unintelligible to the transcriber but that may or may not have been intelligible to the listener and that clearly 'did not cause a conversational breakdown. In addition, the category of "unclear" included conversational overlaps.

Breakdown Analysis

All utterances that were not part of either a conversation or nonverbal episode (see below) were coded as conversational breakdowns. It is usually the case that the partners have not yet begun to share a focus of attention or one partner fails to respond to the initiations or continuations attempted by the other. The major indicators of breakdown are time gaps (more than 5 seconds between consecutive utterances), changes in the focus of conversation or in the item under discussion, and changes in the function of the utterance (for example, changes from questions to commands). However, these are only indicators of breakdown and all information is taken into account in deciding if a conversation is continuing or indeed breaking down.

Parental speech. Parental speech was analyzed in terms of Breakdown Topic Changes, Breakdown Non-Acknowledgments and Breakdown Requests for Clarification following the work of Tomasello et al. (1990). In addition, Breakdown Initiations (commands or requests to which the child fails to respond) and Breakdown Comments (utterances involving parental comments that are not responded to by the child) were included in this analysis.

Children's speech. Within these noncontingent episodes children's speech was categorized as involving initiations (all requests, commands, and comments to which the parent fails to respond) or self-continuations, both verbal and nonverbal.

Nonverbal Episodes

Sometimes during the interaction the partners are not holding a conversation, but are nonetheless interacting, for example, during rough and tumble play, games with a ball. These episodes, which are mainly nonverbal in nature, were coded as nonverbal episodes. Within these episodes some language is used and was coded as either being initiations, comments, commands, or responses.

CHILDES and Data Analyses

The present study made use of a computer/video station for analysis purposes. Thus, the person coding was able to play back the video as well as look at the transcript on the computer screen in order to make decisions for the analyses. The coder then inserted the code directly into the computer following the CHAT format that allows for a coding line. For analysis purposes the FREQ and KWAL programs of CLAN were used. The FREQ program computes frequency counts of the given codes inserted in the coding line of the analyzed transcripts. The KWAL program allows one to extract key words or codes and their context (i.e., and x-number of previous and following codes and their transcript lines). Thus, KWAL enables one to look at particular dialogue sequences surrounding a specific event, for example, a simple recast.

Reliability

In order to measure the reliability of the analysis, a second coder was appointed who independently coded the data for 4 out of the 18 children chosen at random. The second coder, who was the first author, had been involved in designing the coding scheme and working with it previously for 1 year with other data. Thus, the coders in the study were highly experienced and very familiar with the coding scheme. Overall percentage agreement for all the analyses was 95.5%. The agreement per analysis was as follows: 94.7% for the contingency analysis; 93.6% for the breakdown analysis; and 98.1% for the nonverbal episodes analysis.

Results

Statistical Procedures

The present design involving children with SLI and 2 different sets of control children (the sibling controls and the control children) presents with a particularly interesting opportunity to compare the behaviors of children with SLI with those of their own younger siblings as well as other children of the same language stage.

Nonetheless, this relationship between the children with SLI and the younger siblings means that 2 of the 3 groups of children share the same parents and are related to each other. As the present study looked at interactive, conversational behaviors this is problematic for statistical comparisons such as analyses of variance that assume independence between the groups to be compared.

For this reason, three different comparisons were made using two-way analyses of variance. A between-groups design was used to compare the children with SLI to the control group and the siblings to the control group. A repeated-measures design was used to compare children with SLI and the siblings.

General Characteristics of Dialogue

Table 2 presents the mean for the number of conversations, utterances, utterances per conversation, proportion of utterances involving breakdowns, the proportion of turns contained in nonverbal episodes, the proportion of utterances involving unclear speech including overlaps, and the proportion of parental contingent utterances as a function of parent (mother, father) and child status (SLI, SIB, control). No significant differences were found for number of utterances, proportion of utterances involving breakdowns, proportion of utterances involving unclear speech including overlaps, and proportion of parental contingent utterances. In addition, none of the comparisons between children with SLI and their younger siblings using repeated measures analyses of variance were significant for any of the variables in the study.

As far as mean number of conversations was concerned comparisons between siblings and control children using parent (mother vs. father) and child status (sibling vs. control) as independent variables revealed a significant two-way interaction, $F(1,20) = 4.7, p < .05$. Further one-way analyses of variance revealed the interaction to be focused on significant differences between mothers and fathers interacting with siblings. Mothers had more conversations with the siblings than fathers did, $F(1, 10) = 6.9, p < .05$. One-way comparisons between mothers and fathers interacting with their control children were not significantly different, $F(1, 10) = 0.7, p > .10$.

Comparisons of the mean number of utterances per conversation also revealed significant two-way interactions for the SLI versus control comparisons, $F(1, 20) = 6.5, p < .05$ and the sibling versus control comparisons, $F(1, 20) = 6.95, p < .05$. Further one-way comparisons revealed the interaction to be focused on significant differences between mothers and fathers interacting with the control children. Mothers and their control children had significantly more utterances per conversation, $F(1, 10) = 5.9, p < .05$. One-way comparisons between mothers and fathers interacting with their children with SLI or the siblings were not significantly different, $F(1, 10) = 0.9, p > .10$ and $F(1, 10) = 1.4, p > .10$, respectively.

Furthermore, comparisons of the proportion of nonverbal episodes in the interaction revealed a significant main effect of parent for siblings and control children. Fathers had more nonverbal episodes than mothers for both siblings and controls, $F(1, 20) = 5.6, p < .05$. No differences between parents were found for children with SLI when compared to control children or their own siblings.

In addition, it seemed important to ascertain whether the results obtained above, for example, the differences in conversation length of mothers of controls compared to mothers of children with SLI and siblings, were not an artifact of the gender differences in the composition of the subject groups and their associated variations in same-sex, cross-sex dyadic sampling conditions. In the present study, mothers and children with SLI created five cross-sex interactions whereas mothers and the siblings created four cross-sex interactions, and mothers with controls created three cross-sex interactions. Two-way analyses of variance with unweighted means were carried out using child status (SLI vs. control, SIB vs. control, SLI vs. SIB) and sex of dyad (same-sex vs. cross-sex) as independent variables selecting each of the parents one at a time. No significant differences were

found in the gender analysis. Therefore, it was thought that the results above were not likely to be an artifact of the composition of the subject groups. Nonetheless, it needs to be noted that the number of subjects in the present study was very small and this may have made it difficult to find patterns of gender differences that may become more obvious in a larger scale study.

Contingency in Dialogue

Similarities and differences among the different groups observed were also explored for each of the categories in the contingency analysis. Results revealed main group effects for simple recasts and acknowledgments. It was found that control children received significantly more simple recasts than children with SLI, $F(1, 10) = 4.4$, $p < .05$, and more than siblings, $F(1, 20) = 6.3$, $p < .05$. Similarly, control children received significantly more acknowledgments than children with SLI, $F(1, 20) = 13.7$, $p < .001$, and more than siblings, $F(1, 20) = 18.4$, $p < .001$. Table 3 presents the mean and standard deviations for the different categories of parental contingent speech.

In addition, results presented in Table 3 revealed significant differences across conversational partners (fathers vs. mothers) for two of the variables: requests for clarifications and imitations. It was found that fathers used significantly more requests for clarification than mothers, $F(1,20) = 4.6$, $p < .05$, for the sibling and the control groups. In addition, mothers used significantly more imitations than fathers when interacting with children with SLI and control children, $F(1, 20) = 5.9$, $p < .05$, and when interacting with siblings, $F(1, 20) = 6.7$, $p < .05$.

In addition, a gender (same-sex vs. cross-sex) analysis revealed no significant differences attributable to sex composition of the dyads for the contingency analysis. Similarly, none of the comparisons between children with SLI and their siblings were significant.

A further qualitative analysis of requests for clarification was carried out following the work of Tomasello et al. (1990). In this analysis we examined conversational sequences in which requests for clarification occurred, taking account of the child's responses to the queries. The analysis focused on the two prior turns to the request for clarification (RC), the RC itself, and the two turns following the RC. Of particular interest were how the child responded to the RC and whether the adult then continued to request clarification. It was found that children failed to clarify (i.e, they did not even attempt to clarify) for the adult equally often for mothers and fathers (52% and 51%). When the child did attempt to clarify, mothers and fathers reacted differently. Fathers usually accepted the attempt whatever its nature. Mothers responded in this way on many occasions as well, but often they continued to request more clarification within the same conversational sequence. Approximately one fifth of the instances in which the mother requested clarification contained "looped" sequences (Porter & Conti-Ramsden, 1987) where the mother responded to the child's attempt to clarify by requesting further clarification. Thus, mothers re-entered a clarification sequence (looped) proportionally twice (21%) as often as fathers (10%). Following are examples to illustrate differences between mothers and fathers and their requests for clarification.

Maternal request for clarification (looped)

CHI: cats
 MOT: do your cats?
 CHI: no
 MOT: no?
 don't want to do cats?
 eh?
 CHI: no

Paternal request for clarification

CHI: xxx there

FAT: pardon?

CHI: there

FAT: yeah that is part of the train

In addition, two further analyses were conducted focusing on more qualitative characteristics of the simple recasts in parent-child interaction. First, a sequential analysis was carried out to ascertain the dialogue sequence that surrounded a simple recast. Simple recasts were identified and the two previous turns as well as the two following turns were analyzed. Two interesting findings emerged from this analysis. As can be seen in Figure 1, for the normal language-learning children (siblings and controls) simple recasts were preceded more often by a child's interactive utterance. Recall from the coding scheme that interactive utterances were children's spontaneous utterances. In the case of children with SLI, simple recasts were more often preceded by a child's responsive utterance and less often by a child's interactive utterance. These two types of sequences are exemplified below.

Simple recast preceded by an interactive utterance

CHI: crayons on knee

FAT: put the crayons on your knee

yes

Simple recast preceded by a responsive utterance

MOT: what are you making?

CHI: ship

MOT: a big ship

In order to fairly evaluate the proportional data in Figure 1, it would be important to analyze the frequencies of responsive and interactive utterances for each group of children across parents. Table 4 presents such data. Two-way analyses of variance for each of the comparisons (SLI vs. control, SIB vs. control, SLI vs. SIB) by parent (mother vs. father) revealed no significant differences across any of the categories. Thus, it may be unlikely that the proportional data in Figure 1 simply reflects children's frequency of usage of interactive versus responsive utterances.

Thus, the child's preceding utterance provides a "platform" for recasting and the comparison possibilities relevant to language growth depend both upon the nature of the platform (whether interactive or responsive or, in other words, whether the focus or topic of the conversation is initiated by the child or initiated by the parent) as well as the details of the recasting that follows. Further analyses below explore such details.

Furthermore, the aforementioned sequential analysis revealed differences across groups on the nature of the simple recast sequences. Most of the time all children and their parents shared a simple recast sequence that had a simple format of: child utterance, parental recast, child or parent utterance. Nonetheless, for control children interacting with their mothers 23% of the recast sequences had additional or "looped" recasts. That is, mothers responded to the child's response to a recast with further recasts (simple or complex) approximately 1/4 of the time (23%). For fathers and their normal control children the proportion of recast sequences containing more than one recast was 9%. Thus, mothers of control children re-entered a recast sequence (looped) proportionally more than twice as often as fathers of control children. Interestingly, there was no evidence of looped recast sequences for the families with children with SLI (fathers and mothers as well as children with SLI and siblings). Recall that families with children with SLI and their offspring did engage in recasts in dialogue (see Table 3) but the sequences did not appear to contain further recasts.

Second, a qualitative analysis of the content of simple recasts was carried out by looking at the child's preceding utterance and the parental simple recasts in order to ascertain what precisely was being offered by the simple recast in terms of "available syntactic information" to the child. In broad terms two major types of simple recasts were found. New noun-phrase information recasts involved simple recasts that worked mainly on the noun phrase and involved providing information on number (ship--ships), determiners (bat--the bat), modifiers (boy--good boy), nouns (green--green apples), and so on. New verb-phrase information recasts involved simple recasts that worked on the verb phrase and involved providing information on verb agreement (jump--you're jumping), providing verbs (that Susan ship--that is Susan's ship), extending single words to verb phrases (yellow--that is yellow). Some utterances provide new information that expands both a noun phrase and a verb phrase. For example, "that Susan ship" recasted as "that is Susan's ship" simultaneously provides the missing copula and expands the object noun phrase by adding the possessive "s." As long as recasts involved the verb-phrase they were coded as new verb-phrase information recasts. Therefore, new verb-phrase information recasts contained recasts that only provided information on the verb-phrase as well as recasts that provided new information on both the verb-phrase and the noun-phrase. This recast qualitative analysis was carried out independently by a second coder and the reliability obtained was 100%.

As can be seen from Figure 2, both normal language learning children (siblings and controls) received more new verb-phrase information simple recasts than children with SLI did. In fact, the normal language learning children received new verb-phrase information simple recasts proportionally twice as often as the children with SLI. As far as new noun-phrase information recasts were concerned, children with SLI experienced this type of simple recast approximately 81% of the time whereas the siblings and control children received this type of recast just over 60% of the time.

Discussion

Children in the Present Study

It has been recognized and it is well documented that children with SLI form a highly heterogenous group of children with differing profiles of abilities and difficulties (Bishop, 1992). It is also apparent that European and American scholars do not always use the same criteria to select children with SLI. Most researchers in the U.S.A. apply Stark and Tallal's (1981) exclusion criteria whereas European researchers (e.g., Bishop & Edmundson, 1987) may use referral sources or educational/therapeutic intervention as criteria. Two notable differences between the present study and the American descriptions of specific language impairment are the birth history/neurological status and the general developmental history of the children participating in the study. It is therefore important to emphasize that the present investigation may be dealing with a particular subgroup of children with SLI and our results may not be generalizable to other groups of children with SLI.

Contingency: Recast Gaps

This study is the first to document reliably that children with SLI at the early stages of development (Stage I/Early Stage II) experience a simple recast gap in their linguistic input. That is, parents of children with SLI use fewer simple recasts than do parents of control children. This finding extends the work of Conti-Ramsden (1990) and Nelson et al. (1995) who both found children with SLI in later stages of development (Stages III-IV) to have a complex recast gap in their input. Furthermore, results of the qualitative analyses on simple recast sequences provide us with some possible explanations for the low use of simple recasts with children with SLI. First, it was found that for the normal language learning children (control and sibling) parental recasts most often were preceded by a child's interactive utterance. In contrast, in the case of children with SLI, simple recasts were most often preceded by a child's responsive utterance and less often by a child's interactive utterance. Previous studies (Conti-Ramsden, 1990; Hadley & Rice, 1991; Hutcheson & Conti-Ramsden, 1992; Paul & Elwood, 1991) have found children with SLI to be less active conversational partners in that they do not

initiate conversations as often as normal language learning children do. They appear to have a more passive, or responsive role in dialogue and are therefore less likely to take discourse steps that make it easy for an adult to use a recast. In the present small scale study no significant differences were found between the different groups in the number of interactive versus responsive utterances. It needs to be noted that our sample was small and the standard deviations for the children with SLI were high, which may have made it difficult to ascertain differences between the groups.

What the present study has provided is evidence of the intricate relationships between parental speech and child speech. In line with Nelson's Rare Event Theory (Nelson, 1981, 1987; Nelson et al., 1984) it may be argued that providing recasts to children's responses is not as "rewarding" nor may it result in as much "uptake" of challenges to language growth by the child as recasts that are working with the raw, spontaneous linguistic material provided by a child. Thus, the present study not only points to the quantitative fact that the children with SLI in this study who were in the early stages of syntactic development receive fewer simple recasts than control children but also demonstrated that the conversational functional context in which simple recasts occur is also different.

Furthermore, it was found that parents of control children engaged in "looped" simple recast sequences that were nonexistent in families with children with SLI. In these sequences parents responded to the child's response to a recast with further recasts (simple or complex). Although mothers did this significantly more often (23%) than fathers (9%) of normal control children (see discussion below), note again that neither parent provided any such "looped" extended recast sequence to the children with SLI. Therefore, control children engage in longer and perhaps more complex sequences of recasts that may provide a "platform" for zeroing in the attention of the child on particular kinds of syntactic contrasts. A typical example of a looped sequence from our data was as follows (where CHI represents a child's turn and MOT or FAT represents a parental turn):

CHI: Peeping
 MOT: He is peeping
 CHI: He is peeping
 MOT: Yeah, look!
 He is peeping
 CHI: Alex look
 MOT: Alex, look he is peeping
 Yeah, look he is peeping

Such "looped" or recurrent recast sequences were not available to children with SLI and for them the most common conversational sequence involved the child responding and the parent providing a simple recast. For example:

FAT: What are you making?
 CHI: Ship
 FAT: A big ship

Perhaps the more passive conversational nature of children with SLI does not provide parents with opportunities to continue the recast sequence with further recasts in that often the child with SLI is not forthcoming in dialogue. Alternatively, there may be subtle aspects of parental discourse to control children that support more nonresponsive, interactive contributions by these children as compared to children with SLI.

Of interest also was the qualitative content analysis of simple recasts. It was found that children with SLI received fewer new verb-phrase information simple recasts and more new noun-phrase information simple recasts. Recent studies have found that children with SLI have particular difficulties with verbs (Fletcher, 1992; Rice & Bode, 1993; Rice, Buhr, & Nemeth, 1990; Watkins, Rice, & Moltz, 1993). Specifically, children with SLI use fewer different lexical verbs in spontaneous speech samples and are worse at learning verbs than learning

nouns. It is possible that the difficulties with verbs of children with SLI may affect the parents' input frequency of recasts involving verbs. Taking this speculation further, the scenario may be something like this. Initially, parents provide a wide range of recasts to their children (as evidenced by the fact that parents of children with SLI are able to provide both new verb-phrase information recasts and new noun-phrase information recasts to their younger normal language offspring of the same language stage). The response patterns of children with SLI provide feedback to parents that results over many months in parents lowering their use of recasts involving verbs. Nonetheless, it is also possible that parents lower use of verb simple recasts results in fewer opportunities to learn verbs. Caution needs to be exercised in relation to this possible explanation as the evidence provided by the present study relates mainly to the use of copula and auxiliary BE and does not include enough instances of lexical verbs, which appear to be particularly difficult for children with SLI. In addition, the present investigation cannot disentangle whether parental input exacerbates or causes the verb problem of children with SLI or whether the type of parental input is related to the child's own "intrinsic" verb problem. Furthermore, these possible explanations are not necessarily mutually exclusive. Future research, with special attention to input, on the verb development of children with SLI is certainly warranted.

In addition, it was found that normal control children received more parental acknowledgments (both from mothers and fathers) than children with SLI did. This finding is consistent with the results of Conti-Ramsden (1990) with mothers and extends the findings now to include fathers. Conti-Ramsden (1990) found mothers of normal language learning children used language in mainly a responsive function especially to acknowledge whereas mothers of children with SLI used language mainly for assertive and directive functions. Our findings are consistent with the interpretation that such differential use of language constitutes either an effort to actively engage the child with SLI in dialogue and maintain the interaction, or a consequence of interacting with a passive partner in conversation.

Finally, and most importantly, it needs to be noted that there were no differences between the groups in overall parental semantic contingency. Thus, the group differences relevant to language learning discussed above need to be put in perspective in that they involved specific kinds of semantic contingencies, namely simple recasts (and their subtypes) and acknowledgments.

Differences Between Mothers and Fathers

The findings of the present study corroborate previous research comparing mothers and fathers of normal language learning children and extends the scope of the findings to include parents of children with SLI. In the present study, it was found that, much like Tomasello et al. (1990), fathers and children experience more requests for clarification than mothers and children do. This was a main effect for two out of the three groups of children. Fathers requested clarification of the child's utterance proportionally almost twice as often as mothers. Presumably, these requests resulted from a lack of familiarity with the child's speech and therefore some sort of comprehension failure. In addition, qualitative analysis of request for clarification sequences revealed that mother-child dyads and father-child dyads in the present study also differed in the way in which they sought clarification. Mothers more often engaged in multiple bouts (loops) within a single conversational episode whereas fathers' clarification sequences were shorter and tended to accept the child's attempt to clarify whatever its nature. These findings seem to support a major part of the Bridge Hypothesis, namely, that children's conversational interactions with their fathers do not run as smoothly as those with their mothers. The evidence from requests for clarification exemplify a "disrupted flow" of conversation that may force the young language learning child to make adjustments if joint attention with the adult is to be maintained (Tomasello, 1988).

Two further findings may add to our explanations of parental similarities and differences. First, mothers were found to imitate significantly more than fathers did. Second, father-child dyads with siblings and controls engaged significantly more often in nonverbal interactive episodes than mothers did. Taking these results with the findings of requests for clarification may lead us to consider that some of the parental differences in the nature of conversational interaction may not be due to differences in the two parents' ability to understand their child, as the Bridge Hypothesis suggests, but to differences of expectation or motivation. In particular, fathers' acceptance of children's clarifications might plausibly emanate from an unmotivated state. Similarly, fathers' increased bouts of nonverbal episodes with their children may suggest less desire to communicate linguistically (Ratner, 1988; Tomasello et al., 1990). In the same vein, mothers' greater use of looped sequences and imitations, participation in longer conversations and less engagement in nonverbal episodes might evidence a greater desire to communicate linguistically with the child. It is also possible that some of the differences observed may be due to a complex interaction between parental familiarity and competence (The Bridge Hypothesis) and motivational factors. Further research, particularly with atypical language learners, should provide insights into this area.

Younger Siblings of Children With SLI

The present study is methodologically interesting in that it provides a "natural" control situation where a family with an older child with SLI also has a younger offspring who appears to be developing language normally. The results of the present study revealed interesting similarities and differences in parental speech to their children with SLI and offspring. Perhaps the closest previous study in this area is that of Cross (1981). She studied children with SLI, their younger, normal language learning siblings and normal children without siblings with SLI much like the present study. The main difference is that her children with SLI were not of the same language stage as the younger siblings studied. In a series of comparative studies she found that there were less than half the differences between the mothers' conversational styles in the sibling-normal child comparisons relative to the SLI-normal child comparisons. Given these results she concludes that mothers of children with SLI are not conditioned by their experience of SLI to talk to their younger normal children in the same way. Nonetheless, if we turn Cross's data around, it can be seen that a noticeable proportion (just under half) of the differences were persistent in the sibling-normal child comparisons, including maternal use of expansions and negative imperatives at the discourse level. Of particular interest was the finding that mothers of children with SLI, when talking to their younger normal offspring, used significantly fewer expansions than mothers of normal control children of the same language stage.

As is well known, the definition of "expansions" overlaps greatly with current definitions of simple recasts. Expansions for Cross (1981) involved maternal utterances that partially or fully overlapped with the child's previous utterances but "expanded" or added to it syntactically. Therefore, the results of the present study are consistent with Cross's earlier findings that siblings of children with SLI receive proportionally fewer simple recasts than siblings of non-SLI children. But, unlike Cross, we would argue that there does appear to be a spillover in conversational style in these particular families studied where the older child had SLI. But, like Cross, we believe the results are NOT consistent across categories and different levels of analysis. As a matter of fact, it is clear that often the siblings were indistinguishable from the normal control children. For example, siblings received proportions of new noun-phrase information and new verb-phrase information simple recasts similar to those received by the normal control children and therefore differed from their older relatives with SLI. Furthermore, siblings had proportions of interactive utterances preceding simple recasts similar to those of the control children. Nonetheless, as far as looped sequences were concerned, siblings, like their brothers/sisters with SLI, did not receive any from either their mothers or their fathers. Therefore, although their recast experience was quantitatively similar overall to that of their older relatives with SLI, it was qualitatively more like that experienced by the control children except for the looped sequences. It is clear that there may be a

number of factors at play here that may interact to form this complex picture. Further research on siblings of children with SLI is badly needed not only because of the dynamics involved in having an impaired child in the family but also because of the growing body of knowledge that suggests SLI may have a genetic component and therefore relatives of children with SLI may be at risk for language difficulties (Bishop, in press).

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TABLE 1. Characteristics of the subjects.

Child	Age	Sex	MLU	LIPS	PLS	BPVS	TROG
Clay (SLI)	6:5	M	1.22	86	91	88	84
Charles (SIB)	2:11	M	1.38	91	98	95	NA
Kaleb (Cont)	1:10	M	1.19	91	86	NA	NA
Jack (SLI)	4:11	M	1.39	127	124	97	103
Jim (SIB)	2:4	M	1.53	101	123	NA	NA
Janet (Cont)	2:2	F	1.34	113	108	NA	NA
Kate (SLI)	4:10	F	2.19	95	82	78	[d]
Kyle (SIB)	2:5	M	2.07	101	91	NA	NA
Kevin (Cont)	1:11	M	2.05	96	91	NA	NA
Martin (SLI)	3:9	M	1.17	105	103	86	[d]
Mathue (SIB)	2:0	M	1.35	101	104	NA	NA
Mary (Cont)	2:1	F	1.30	118	100	NA	NA
Rick (SLI)	6:10	M	2.33	101	96	77	82
Rose (SIB)	3:3	F	2.36	108	87	91	NA
Robert (Cont)	3:1	M	2.02	127	108	100	NA
Sid (SLI)	4:9	M	1.54	110	103	76	99
Susan (SIB)	2:5	F	1.21	98	93	NA	NA
Sally (Cont)	2:5	F	1.32	108	103	NA	NA

Note. All names are pseudonyms; age is at time of video recording; SLI = child with specific language impairment; SIB = normal language learning sibling of the child with SLI; CONT = control child of the same language stage as SLI/SIB; LIPS = Leiter International Performance Scale (Leiter, 1969), standard score; MLU = mean length of utterance; PLS: Preschool Language Scale (Zimmerman, Steiner, and Pond, 1969) standard score; BPVS = British Picture Vocabulary Scale (Dunn, Dunn, Whetton, and Pintillie, 1982), standard score; TROG: Test of Reception of Grammar (Bishop, 1983), standard score; NA = not applicable; [d]: child could not do the test; score below test floor.

TABLE 2. Means and standard deviations (in parentheses) for conversational measures as a function of parent and child status.

Legend for Chart:

- A - General characteristics of dialogue
- B - SLI Mother
- C - SLI Father
- D - SIB Mother
- E - SIB Father
- F - Control Mother
- G - Control Father

A	B	C	D	E	F	G
Mean number of conversations						
30.8 (7.0)	29.0 (14.0)	31.3 (8.5)	20.3 (5.7)	20.3 (10.2)	25.7 (11.7)	
Mean number of utterances per 10 min of interaction						
302.2 (44.8)	323.5 (126.3)	299.3 (54.4)	273.0 (76.4)	287.2 (97.8)	310.8 (70.8)	
Mean number of utterances per conversation						
5.6 (1.6)	6.5 (1.7)	5.1 (1.2)	6.4 (2.4)	10.9 (2.2)	7.5 (2.6)	
Proportion of utterances involving breakdown						
12.2% (7.4)	11.6% (5.9)	20.19% (6.8)	12.7% (6.7)	12.3% (9.6)	12.9% (3.2)	
Proportion of nonverbal episodes						
9.4% (10.7)	12.9% (20.7)	4.9% (3.3)	22.2% (21.5)	0% (0)	12.1% (21.2)	
Proportion of utterances involving unclear speech including overlaps						
4.1% (2.8)	3.8% (3.6)	4.1% (2.9)	2.7% (2.5)	2.2% (1.1)	2.7% (1.7)	
Proportion of utterances involving contingent speech						
74.4% (9.7)	71.8% (18.3)	70.9% (6.8)	62.5% (20.6)	85.5% (9.6)	72.3% (22.7)	

TABLE 3. Means and standard deviations (in parentheses) for frequency of parental contingent speech within conversations.

Legend for Chart:

- A - SLI Mother
- B - SLI Father
- C - SIB Mother
- D - SIB Father
- E - Control Mother
- F - Control Father

A	B	C	D	E	F	G
Initiations						
39.8 (17.2)	41.2 (27.2)	36.7 (13.3)	28.5 (12.4)	50.8 (25.0)	41.3 (20.7)	

Comments

31.3	35.5	33.8	24.7	44.0	29.3
(10.4)	(14.8)	(19.3)	(12.6)	(15.5)	(25.9)

Simple recasts

4.8	2.0	2.5	2.3	10.7	5.3
(2.6)	(1.6)	(2.1)	(2.6)	(7.2)	(7.5)

Complex recasts

2.8	2.3	1.8	2.2	2.7	2.2
(1.5)	(3.0)	(0.8)	(1.5)	(2.4)	(1.8)

Requests for clarification

4.8	13.0	7.5	8.5	3.0	7.2
(3.6)	(11.9)	(2.4)	(4.3)	(3.4)	(5.8)

Imitations

4.2	1.7	4.2	1.0	8.8	1.3
(2.1)	(2.2)	(2.9)	(0.9)	(9.5)	(1.4)

Acknowledgments

2.2	2.7	1.3	1.8	8.5	7.3
(1.3)	(2.8)	(2.3)	(1.8)	(3.5)	(5.6)

TABLE 4. Means and standard deviations (in parentheses) for children's interactive and responsive utterances.

Legend for Chart:

- A - No Heading
- B - SLI, Mother
- C - SLI, Father
- D - SIB, Mother
- E - SIB, Father
- F - Control, Mother
- G - Control, Father

A	B	C	D	E	F	G
Interactive ut- terances that were new conversations	9.8 (8.0)	9.3 (7.0)	11.0 (4.1)	7.5 (4.5)	5.2 (3.7)	7.7 (4.6)
Interactive ut- terances within conversations	18.3 (11.5)	21.8 (8.8)	20.8 (10.9)	17.3 (11.9)	22.5 (10.8)	25.8 (14.2)
Total inter- active ut- terances	28.2 (18.9)	31.2 (14.9)	31.8 (13.4)	24.8 (6.5)	27.7 (13.9)	33.5 (13.5)
Responsive ut- terances	52.5 (20.9)	53.8 (35.9)	40.0 (10.6)	36.3 (17.0)	57.3 (30.9)	58.5 (28.3)

GRAPH: FIGURE 1. Proportion of simple recasts (SR) preceded by a child interactive utterance as a function of parent.

GRAPH: FIGURE 2. Proportion of new verb-phrase information simple recasts as a function of child status.

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