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Maternal Linguistic Input to Toddlers With Slow Expressive Language Development

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Maternal speech styles to children between 20 and 34 months of age who were slow to acquire expressive language were compared to those of mothers with normally speaking toddlers. Aspects of the mothers' speech examined included use of various sentence types (declaratives, negative, questions, etc.), the mother's lexical contingency with regard to the child's utterance; mother's use of pragmatic functions such as requests, comments, and conversational devices; and the mother's use of topic management. Results revealed that mothers of toddlers with slow language development are different from mothers of normal speakers only in their frequency of use of lexical contingency devices, specifically, expansion and extension. However, the proportion of expansions and extensions relative to the number of child utterances is not different, indicating that when late talkers give their mothers something to expand, the mothers do so, but that the late talkers do not give their mothers as much speech to work with as do the normal toddlers. Implications of these findings for parent training are discussed.

KEY WORDS: motherese, toddlers, language delay

The existence of a special speech style used when talking to children in the language learning period is well documented in the literature (Conti-Ramsden, 1985; Gleitman, Newport, & Gleitman, 1984; Snow & Ferguson, 1977; Tiegerman & Siperstein, 1984). This style, often referred to as "motherese" or "child-directed speech," includes reductions in sentence length, use of repetitive, concrete vocabulary, changes in pitch, stress, and intonational patterns, restriction of topics to here and now, as well as changes in other pragmatic and discourse functions, and is generally believed to contribute to the child's language development (see Chapman, 1981, for review). Some research has suggested that the linguistic environment of children who evidence language impairments is different from that of normally developing children (Cramblit & Siegel, 1977; Petersen & Sherrod, 1982; Tiegerman & Siperstein, 1984; Whitehurst, Novack, & Zorn, 1972) and may be a factor in their deficit (Clezy, 1979). Most studies, though, (Conti-Ramsden, 1985, 1990; Conti-Ramsden & Friel-Patt, 1984; Cunningham, Siegel, van der Spuy, Clark, & Bow, 1985; see Leonard, 1987, 1989 for review) suggest that children diagnosed as specifically language impaired are receiving a form of input that is well matched to their language level.

The present study is concerned with a group of children who are not yet diagnosed as showing a specific language disability, but are, rather, at the lower end of the normal developmental continuum. Although some of these children may eventually be diagnosed as language impaired, for the most part their age—under 3 years—would result in their not yet receiving a formal diagnosis. We were interested in finding out whether differences in maternal linguistic input might be an associated factor for a group of very young children with a range of mildly to moderately slow language acquisition. That is, even if it is true that language input to children with constitutional
differences in the ability to learn language does not appear to be contributing to their deficit, it might be the case that the language environment is a factor in slowing down the development of middle-class children who appear to be normal in every way except for their acquisition of intelligible speech. Some children who talk late may not be receiving an optimum language model, and this mismatch between the model and their needs could conceivably affect their rate of acquisition. It is possible, on the other hand, that linguistic input to late talkers does not differ significantly from that of their normally speaking peers. This could be construed to suggest that, like their older, clearly language-impaired counterparts, late talkers are demonstrating some intrinsic qualities that are resulting in slow language growth. A third possibility also exists. In this case, late talkers may be providing their mothers with a different set of linguistic stimuli that, in turn, affects the mother’s input to the child.

Whitehurst, Fischel, et al. (1988) have conducted a study on this topic, using subjects who are more similar to the present sample than those in the previously cited reports. They looked at children 28 months of age who were identified as delayed by an average of 16 months in expressive language development. They found that in terms of use of variety of pragmatic categories, mothers’ speech to delayed children was similar to that of mothers of younger normal children at the same expressive language age but different from that of mothers of normal children of the same receptive language/chronological age. Maternal MLUs for all three groups were not found to differ significantly, however. Like Leonard (1989), Whitehurst, Fischel, et al. (1988) interpreted these findings to mean that poor input is not an etiological factor in expressive language delay in young middle-class children.

The present study looks at a broader range of maternal linguistic behaviors, including assessment of amount of lexical contingency, a finer analysis of maternal syntax, and examination of maternal topic management, in hopes of identifying some that Whitehurst, Fischel, et al. (1988) did not examine but that may be important in facilitating language growth or exacerbating or maintaining delay. The subjects in this study are also somewhat younger and, as a result, less easily diagnosed as obviously language delayed, although some subjects may merit a diagnosis of specific language impairment later in their development. Rather, this sample is construed as representing the lower end of the normal continuum of language development, including children who will eventually be recognized as having shown, in some cases, transient, and in others, chronic language delays. The question being addressed here is whether for this somewhat heterogeneous group of “late talkers,” maternal linguistic input appears to differ significantly from that of normal counterparts in ways that might be seen as contributing to the slow rate of growth, and whether any variation that is found is attributable to differences originating in the mother’s interactive style or to the child’s linguistic input to the mother.

Method

Subjects

Twenty-eight toddlers between the ages of 20 and 33 months served as subjects of the study. They were recruited by collecting 300 questionnaires from local pediatric offices. On the questionnaires, parents of children being seen for well-baby visits were asked to indicate the number of words their children said. Rescorla (1989) and Fischel, Whitehurst, Caulfield, and De Barysche (1989) have shown that parent report of expressive vocabulary size is an excellent index of language status. Any families who indicated on these questionnaires that they were willing to participate in a longitudinal study of language development were contacted and asked to complete Rescorla’s Language Development Survey (LDS) (1989), a questionnaire containing a checklist of 300 of the most common words in children’s early vocabularies and a space on which to record the child’s three longest utterances. Rescorla (1989), as well as Reznick and Goldsmith (1989) and Dale, Bates, Reznick, and Morisset (1989), have shown that parent checklist formats are valid and reliable indices of expressive vocabulary size in toddlers. Using the LDS, children were identified from the pool of interested families as having slow expressive language development (SELD) if parents indicated that the child used less than 50 different words at 20–33 months or did not use any two-word combinations.

These criteria were chosen to select the lower end of the normal distribution of language development. Nelson (1973) has shown that the majority of middle-class children produce 50 different words by 20 months of age. Dale et al. (1989) reported that average vocabulary size at 20 months for a sample similar to the present one in socioeconomic and geographic characteristics was 155.0 words (SD 86.5). Thus, an expressive vocabulary size of 50 words at 20 months falls more than one standard deviation below the mean in their sample. Miller (1981) showed that 20-month-olds who are within one standard deviation of the mean for syntactic development are putting some words together to form telegraphic utterances. It would appear, then, that by 20 months of age, children who fail either to produce 50 words or to use some two-word combinations are functioning at the lower end of the normal continuum. Some of these children may, in fact, be language impaired. And clearly, some of the older children in the present sample (those 30–33 months of age) who meet these criteria would be considered to be delayed by most clinicians. However, none of the children in this sample had been “officially” diagnosed as language disordered. Still, it is important to note that the sample contained toddlers with varying degrees of language delay. Receptive language testing, using the Reynell Developmental Language Scale (Reynell, 1984), showed that this group’s receptive language scores were comparable to their chronological ages (see Table 1) and were not significantly different from those of the normal group.

A normal contrast group was selected from the pool of interested families to match the SELD group in terms of age, sex ratio, and SES. Children were invited to join the normal group if their parents reported expressive vocabulary sizes on the LDS of 50 words or more and the use of two-word combinations at 20–34 months. (Children whose parents reported that they used only routine two-word phrases, such as “good-bye” or “stop it,” would not be considered to produce multiword utterances. In order to receive credit for
two-word phrases, the list of "longest utterances" on the LDS had to contain combinations that appeared to be productive telegraphic sentences.) Average age in both groups was 25 months. Both groups contained 64% boys. Although both groups had a range of socioeconomic (SES) levels represented in them, the means and standard deviations for SES, using a four-factor scale of parent occupation and education adapted from the Hollingshead scale (Myers & Bean, 1968), indicated a primarily middle-class sample. LDS and demographic data for the sample are presented in Table 1.

All subjects who participated in this study were tested on the Bayley Scale of Infant Mental Development (Bayley, 1969), and all scored above 85 on this measure. Because fully half of the Bayley items at the 18–30-month level involve language functioning, comparing the two groups on Bayley scores would only reflect the SELD group's depressed language levels, rather than general cognitive abilities. The groups were compared, then, on the number of nonverbal items passed. Because all subjects passed all items up to Item #123 (18-month level), only nonverbal items after #123 were scored. There were 20 nonverbal items in this set. The normal subjects passed an average of 17.0 items (SD 4.4). The SELD group had an average of 15.4 items correct (SD 3.55). A t test revealed that this difference was not significant. Thus, the groups appear roughly comparable in terms of nonverbal cognitive ability.

Hearing screenings were conducted via speech reception threshold in a sound field at 25 dB HL for all subjects, using visually reinforced audiometry in a soundproof booth. A Maico Model 24B clinical audiometer, calibrated to meet American National Standards Institute specifications (ANSI, 1969) was used. All subjects passed this screening. All also passed informal observational screening for neurological disorders, rather than general cognitive abilities. The groups were compared, then, on the number of nonverbal items passed. Because all subjects passed all items up to Item #123 (18-month level), only nonverbal items after #123 were scored. There were 20 nonverbal items in this set. The normal subjects passed an average of 17.0 items (SD 4.4). The SELD group had an average of 15.4 items correct (SD 3.55). A t test revealed that this difference was not significant. Thus, the groups appear roughly comparable in terms of nonverbal cognitive ability.

Procedures

The subjects were seen for three separate evaluations at a university clinic, each for a period of about 2 hr, during which an extended break was taken for snacks and recreation. During the first, an extensive parent interview was conducted (see Paul, Spangle-Looney, & Dahm, 1991), and cognitive testing and hearing screening took place. During the second, direct language assessment was done with standardized tests, and the speech sample analyzed in this study was collected on videotape. During the third, the Bayley scale was done. Thus, for the interaction that formed the basis of this study, each child was visiting the clinic room for the second time and had spent a total of about 4 hr there with his/her mother by the time the speech sample was collected. Analysis of communicative intentions, using the same interactive samples described here (Paul & Shiffer, in press), revealed that both normal and late talking children were producing communicative acts with rates per unit time very similar to those produced by normal children of similar language ages in longer, more structured samples by other researchers (Wetherby, Cain, Yonclas, & Walker, 1988). Thus, the communication samples collected for this study would appear to be relatively valid reflections of the dyads' interactive styles.

The subjects were videotaped for exactly 10 min playing with their mothers in this clinic room with a standard set of toys. The mothers were told, "Play with your child as you would at home. I will be videotaping you for 10 min." Mothers were told that the purpose of the videotaping was to see the way the child played with toys, rather than to observe either the mother's style or the child's speech. These directions were chosen in order to minimize any pressure the mothers may have felt to get the children to talk or to perform, or to optimize their own interactive style. Still, the possibility that the mothers' interactive styles were affected in some way by the nature of the observation cannot be entirely dismissed.

The video recordings of the mother's and child's speech were transcribed with notation of the child's nonlinguistic behaviors. Only maternal utterances directed to the child were coded.

Coding. Each of the mother's child-directed utterances was coded along four dimensions.

1. Syntax. Each maternal utterance was coded according to its grammatical form. The following categories were used: Declarative sentences (e.g., The ball is red.) Negative sentences (e.g., The ball isn't red.) Questions: wh-, yes/no, and tag questions Complex sentences: those containing more than one main verb, such as "I think you're silly." Imperatives (e.g., Stop that!) Fragments lacking some component of a complete sentence (e.g., Going up!)

MLU (mean length of utterance in morphemes) was computed for both mother and child according to Brown's (1973) rules. The difference between mother and child MLU was also calculated for each dyad.

2. Pragmatic function. The illocutionary intent of each maternal utterance was coded, using the following categories:

Request for information [i.e., queries seeking information about the child's internal state (e.g., Are you hungry?), activities (e.g., Is Johnny playing?), or about the nonlinguistic environment (e.g., Is the ball rolling?)]. Requests for clarifi-

**TABLE 1. Demographic and language characteristics for two subject groups.**

<table>
<thead>
<tr>
<th></th>
<th>Normal</th>
<th>SELD</th>
</tr>
</thead>
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<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Chronological age (months)</td>
<td>25.5</td>
<td>4.5</td>
</tr>
<tr>
<td>Language Development Survey vocabulary size</td>
<td>198.5</td>
<td>88.9</td>
</tr>
<tr>
<td>MLU (mean length of utterance in morphemes)</td>
<td>30.7</td>
<td>9.7</td>
</tr>
</tbody>
</table>

*Using Myers and Bean's (1968) adaptation of the Hollingshead method, on a scale from 1 to 5 with 1 being the highest SES level.*
categorization (e.g., "The ball is what?") were also included in this category.

Comments [i.e., descriptions, statements, facts, attitudes, and beliefs (Dore, 1977)]. These were subdivided into positive comments that did not refute or correct the child (e.g., "You're riding the horsie!") and negative comments that rejected or corrected child utterances (e.g., "You're not riding the cow, you're riding the horsie!").

Requests for action: attempts to get the child to do something or stop doing something, such as "Why don't you feed the doll?"

Conversational devices such as "oh, yeah, uh-huh"

Bids for attention: devices used by the mother to direct the child's attention to an object or activity, such as "Lookit!" or "Hey, John!"

Responses to child's bid for attention: remarks in which the mother responded verbally to a child's attempt to get her attention, such as "Yes? Hmm?"

3. Topic management. This category examined the extent to which the mother selected and controlled the topic of the interaction. The following categories were used:

- Mother introduces new topic.
- Mother reintroduces a topic she introduced previously in the discourse.
- Mother maintains her own topic.
- Mother maintains child-initiated topic.
- Mother reintroduces topic introduced by the child earlier in the discourse.

4. Lexical contingency. Each maternal utterance was examined with reference to the content of the child's previous utterance and activity. The mother's utterance was scored as lexically contingent if it was:

- an imitation—direct complete or partial repetition of the child's utterance, such as,
  - Child: All gone.
  - Mother: Yes, all gone.

- expansion—grammatical rendering of the child's previous utterance, such as,
  - Child: All gone.
  - Mother: Yes, it is all gone.

- extension—semantically related comment on a topic established by the child, such as,
  - Child: All gone.
  - Mother: Yes, it's all gone, and now the cup is empty.

- reference on the mother's part to the child's activity (e.g., the child is dressing a doll, and the mother remarks, "What a pretty dress!")

- noncontingent utterance: a remark not fitting into one of the above categories, such as,
  - Child: This my dolly.
  - Mother: Here, let me wipe your nose.

**Scoring.** Each maternal utterance was analyzed in the context of the previous child utterance. Each utterance was scored on each of the four dimensions outlined above (syntax, pragmatic function, topic management, and lexical contingency). The percentage of each mother's utterances that was assigned to each of the above categories within these dimensions was computed. Percentages rather than frequencies were used to control for variations in the size of the maternal utterance corpus. A mean percentage across the mothers in each of the two diagnostic groups (SELD and normal) for each category was then calculated. Mean maternal and child MLU were also derived for each diagnostic group, as was the mean difference between mother and child MLU.

**Reliability**

Three trained graduate students independently retranscribed 3-min segments from 6% of the transcripts to check on the reliability of the transcription process. Word-by-word interrater reliability of the transcriptions was 87.6%.

Interrater reliability on the coding system was obtained by having three trained raters independently recode the middle 30 utterances from 20% of the transcriptions, viewing the videotapes in conjunction with the analysis of the transcriptions to get nonverbal information. Point-to-point agreement on the syntactic categories was 93%; on the pragmatic functions, 89%; on the lexical contingency categories, 90%; and on the topic management categories, 91%. Interrater reliability on the MLU calculations was 92%.

**Results**

**Sample Size**

The average number of utterances produced in the 10-min interactions was 135.3 for the mothers of SELD toddlers (SD 47.0, range 43–235). For the mothers of normally speaking toddlers, the mean was 144.1 (SD 59.5, range 22–272). All the mothers' utterances were coded in the syntactic, pragmatic, and lexical contingency analyses. In the topic management analyses, a few utterances had to be excluded due to ambiguous topics. The mean number of utterances used in this analysis was 135.1 (SD 46.1, range 43–235) for the SELD dyads and 143.6 (SD 58.7, range 19–272) for the normally speaking dyads. Although the two groups of mothers in the study were producing comparable amounts of speech in the time period sampled, the children were not. The SELD toddlers produced an average of 17.1 interpretable utterances (SD 21.86, range 0–82); the normal speakers produced a mean of 63.32 (SD 36.8, range 10–139). Because the groups were selected to differ on the basis of their language production, this difference is not surprising. But it is important to bear in mind that the mothers of normally speaking toddlers had a good deal more linguistic input to which to respond than the mothers of the SELD children.

**Comparisons Across Groups**

Student's t tests were used to test the differences between means in each of the categories coded.

**Syntax.** Table 2 shows the means and standard deviations for each group on the syntactic categories. The difference between the MLUs of the mothers and their children in the SELD group was significantly greater than that of the normal dyads (t = -3.82). No other difference reached significance.
**Pragmatic function.** Table 3 gives the means and standard deviations for each group on the pragmatic function analysis. No differences in this dimension reached significance.

**Topic management.** Table 4 gives the means and standard deviations for each group on the pragmatic function analysis. No differences in this analysis reached significance.

**Lexical contingency.** Table 5 gives the means and standard deviations for each group on the lexical contingency categories. The mothers of normal children provided significantly more expansions (t = 3.97) and extensions (t = 2.47) to their toddlers than did the mothers of SELD children. It should be remembered that these data reflect the proportion of the mother's utterances assigned to each category. When the proportion of the child's utterances that received extensions or expansions were compared, it was found that mothers of normal children expanded 8.9% of their child's utterances (SD 6.7), whereas those of SELD children expanded 6.2% (SD 11.4). Mothers of normal speakers extended 5.9% of their toddlers' remarks (SD 8.6), and SELD mothers extended 5.7% (SD 19.0). Both these differences failed to reach significance. Thus, it appears that although mothers of normal toddlers do more expanding and extending in terms of the percentage of these responses in the mother's speech, the mothers are not different in terms of the amount of the child's speech that they extend or expand. The difference in the proportions found in the mothers' speech primarily reflects the fact that the normal toddlers are producing more verbal language, giving their mothers more material to expand and extend.

**Discussion**

The results of this study indicate that mothers of toddlers with slow expressive language acquisition are providing linguistic input that is similar—in terms of its syntactic content, distribution of pragmatic functions, and topic management strategies—to the input provided to normally speaking age mates. Differences observed in the expressive language development of these SELD toddlers cannot be attributed to the fact that they are receiving impoverished input. Nor can the input provided to these toddlers be seen as more syntactically complex, more negative, more directive, less related to the child's activities, or less focused on the child's choice of topic. It should be noted that the categories used in this study to code maternal linguistic input were relatively broad. A more finely grained analysis may have revealed differences that this method did not. For example, Hoff-Ginsberg (1990), using a very detailed analysis of syntactic categories in mothers' speech, was able to associate particular maternal patterns with acceleration of child syntactic development. Although the coding scheme used in this study was less detailed, the results do support the notion that mothers' linguistic input to late talking toddlers is generally similar to that of normally speaking children and is unlikely to be a primary factor in causing children's delay.

The first question that might be raised about these results concerns their discrepancy from findings of Whitehurst, Fischel, et al. (1988) who report that mothers' pragmatic language interactions with language-delayed children are...
similar to those of mothers to younger toddlers of similar expressive skills, but different from those of chronological age mates. The present data suggest that our sample’s language environment was similar to that of normally speaking age mates. One reason for this difference is that the present sample of children was less impaired than the Whitehurst, Fischel, et al. (1988) cohort. Their subjects had an average expressive vocabulary age of 11.9 months, suggesting an expressive vocabulary size of 3–10 words (Templin, 1957) and very little verbal expression. Average vocabulary size in the present sample was 30 words. The present toddlers have somewhat more expressive skill than those in the Whitehurst, Fischel, et al. (1988) sample. Because they are producing some expressive language, they may trigger fewer downward adjustments on their mothers' part. At this early point in the children's development, their mothers may continue to interact with them as normal toddlers. If their rate of growth continues to be slow, however, maternal input may begin to show differences from that given to normal age mates and continue to resemble input to younger toddlers, as Whitehurst, Fischel, et al. (1988) found.

Like Whitehurst, Fischel, et al. (1988), we found that maternal MLU to SELD toddlers resembles sentence lengths used to normally speaking peers, even though the SELD children's own shorter sentence lengths result in a larger gap between maternal and child MLUs. Again, it appears that when differences between normal and SELD children's expressive abilities are relatively small [Whitehurst, Fischel, et al. (1988) propose less than 1 year, as is the case in the present sample], maternal speech characteristics are not strongly affected.

Both groups of mothers in the present sample provide a great deal of lexical contingency in their speech. Seventy-eight–84% of the mothers' utterances are in reference to the child's ongoing activity. The proportion of maternal utterances containing expansions and extensions is greater in the normal group, but when the proportions of child utterances expanded or extended are compared, this difference disappears, indicating that the mothers are expanding and extending similar proportions of child utterances, but the normal children are producing more verbal utterances that can be expanded and extended. These results accord with findings of Conti-Ramsden (1990), who found that mothers of normal and language-impaired children were similar in their use of contingent replies, but that some differences that were observed related to the child's amount of conversational initiation.

Use of expansions and extensions by adults has been linked with increases in language production and acceleration of child language development (Barnes, Gutfreund, Satterly, & Wells, 1983; Cazden, 1965; Cross, 1978; Scherer & Olswang, 1984). It is possible that the difference observed here functions as a maintaining factor for the SELD toddlers. That is, because they talk less, they give their mothers fewer opportunities to provide them with expansions and extensions. This dearth of useful language input could result in reduced opportunities for acceleration of their language growth.

These findings suggest directions for parent training for families of SELD toddlers. First, most parents can be reassured that their language styles are not the primary factor in causing the child's slow rate of language acquisition. The present data suggest that they are talking to their toddlers in ways very similar to those used by parents of normal speakers. Second, parents can be encouraged to increase their use of expansions and extensions so that the proportion of the child's utterances that receives these forms of contingent feedback is supernormal. As Whitehurst, Falco, et al. (1988) suggest, normal behavior, even of motivated middle-class parents, is not necessarily optimal. In their study of picture book reading, having parents increase their use of teaching questions and expansions resulted in significant improvement in expressive and receptive vocabulary for both normal and delayed children. Because parents in both groups in the present study expand and extend less than 16% of their children's utterances, there is ample room for parents to increase their frequency of use of these responses. In this way they may at least reduce the possibility that the child's slow rate of growth is being maintained by a relative scarcity of beneficial input.

The issue of whether parents should be encouraged to shorten their sentences is more complicated. Parents of normal toddlers are producing utterances that are, on the average, two morphemes longer than their children's, whereas SELD parents are producing sentences that are about three morphemes longer. Although this difference is statistically significant, there is little empirical data on which to base a decision that reducing the SELD mothers' sentence lengths by an average of one morpheme would produce any salutary effect. If the mothers are tuning in to the child's comprehension level (Retherford, Schwartz, & Chapman, 1981), the slightly more complex input may be appropriate for helping the toddlers to continue their receptive language growth. Also, the mechanics of teaching mothers to reduce their sentence length by one morpheme may be much more complicated than teaching them expansion and extension techniques. Thus, although the disparity between SELD mothers' MLUs and those of their children may be statistically different from this gap in normal dyads, the difference may not have direct clinical significance. More experimental research on the effects of changes in mothers' utterances' lengths on child language productions is needed to resolve this issue.

In summary, slow expressive language growth in middle-class toddlers does not appear to be associated with deficits in maternal linguistic input. However, this study does suggest some ways to optimize the input these toddlers receive.

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