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Older Siblings as Conversational Partners

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Children (N = 18) between 1½ and 3 years were videotaped in dyadic interaction with their 4- or 5-year-old older siblings, their 7- or 8-year-old older siblings, and their mothers. The child-directed speech of the three groups of older speakers was analyzed for characteristics generally thought to be supportive of young children's language development and in terms of its relation to the age of the young listener. Mothers were more supportive conversational partners than were both sibling groups, and the 7- to 8-year-old siblings were more supportive conversational partners than were the 4- to 5-year-old siblings. Mothers also adapted their speech to the level of their listener more than did either group of siblings. Implications for theoretical debate and future research on the social bases of language development are discussed.

Investigations of the social bases of language development have concentrated on the conversations that young children experience with their mothers. Less research attention has been directed toward the conversations which occur between siblings. Nonetheless, presumptions about the nature of sibling conversations figure importantly in current theoretical debates.

The position that language development is significantly supported by interactive experience rests on descriptions of the seemingly supportive quality of maternal speech and on correlational evidence that variability among mothers in some characteristics of their child-directed speech is predictive of their children's rates of language development. One argument against a role for conversational experience in language development rejects this evidence on the basis of the claim that sibling speech does not share the supposedly supportive characteristics of maternal

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speech. The argument is essentially thus: Given that many children outside of mainstream Western culture are cared for primarily by siblings and other older children, given that children do not speak to younger children the way mothers do, and given that all children acquire language, language development cannot significantly depend on the putative supports identified in studies of maternal speech.

Oddly, this same view of sibling speech as less supportive than maternal speech is also part of arguments for the importance of conversational experience to language development. There are suggestions in the literature that first-borns develop language more rapidly than later borns (see Bates, 1975, for a review) and that differences between maternal and sibling speech contribute to this birth-order effect (Tomasello & Mannle, 1985). The form of this argument is: Given that later born children interact with their mothers less and with older siblings more than do first-born children, given that children do not speak to younger children in the same way that mothers do, and given that later borns acquire language more slowly, the first-borns' language learning advantage may be the result of the support provided by the special characteristics of maternal speech.

Several of the premises in the foregoing arguments rest on shaky empirical ground and could benefit from further investigation, including the cross-cultural uniformity of language development, birth order effects on language development, the relation of maternal speech to language development, and the nature of the conversational experiences that older siblings provide young language-learning children. The present investigation is directed at the last of these premises. In this study we compared the conversations that older siblings and mothers had with young children to determine the extent to which siblings provide the sorts of support for language development that have been identified in previous studies of mother-child conversation.

The qualities of maternal speech which seem to support children's language development can be characterized generally as those qualities which derive from an interest in engaging the child in interaction and a concern to understand and to be understood by the child (Cross, 1977; Snow, Perlmann, & Nathan, 1987). This characterization is consistent with the results of correlational studies of mothers' speech and children's language development in which positive effects were found of the frequent use of (a) questions (Hoff-Ginsberg, 1986; Newport, Gleitman, & Gleitman, 1977), (b) utterances which are similar to the prior utterance in content but use a different syntactic form of expression (Hoff-Ginsberg, 1986; Nelson, Denninger, Bonvillian, Kaplan, & Baker, 1984), (c) topic-extending responses to child speech (Barnes, Gutfreund, Satterly, & Wells, 1983; Cross, 1978), and (d) the maintenance of joint attentional

focus during conversation (Harris, Jones, Brookes, & Grant, 1986; Tomasello & Farrar, 1986). It is also consistent with the evidence that frequent use of directives (particularly those which are not successful) is negatively related to children's rates of language development (Nelson, 1973; Tomasello & Farrar, 1986).

In addition to the prima facie case made by this set of predictors, the notion that the characteristics of language-advancing speech reflect a concern for successful communication is also suggested by evidence that the extent to which adults modify their child-directed speech depends on the child's age and language comprehension abilities (Bellinger, 1980; Fraser & Roberts, 1975; Snow, 1972; Snow et al., 1987). Speech that is adjusted to the child's level and speech which supports language development are not necessarily the same. However, discussions of the quality of older children's speech to younger children, like much of the literature on talk to children, assumes that some sort of adjustment is necessary for conversation to be supportive of language development.

Most of the studies which provide any empirical basis for the characterization of sibling speech as less supportive than maternal speech have been confined to children between ages 2 and 5 talking to their even younger siblings. These studies find that although children of this age do modify their speech when talking to young children, compared to their speech to peers and adults, they do not talk to young children in the same way that mothers do.

Compared to mother-child interaction, older sibling-child interaction includes less talk overall and the speech that is addressed to the young child is more directive, has a higher frequency of attention-getting devices and repetitions, has a lower frequency of questions, and is, in general, less attuned to the younger child (Dunn & Kendrick, 1982; Mannle & Tomasello, 1987; Tomasello & Mannle, 1985; Vandell & Wilson, 1987). Studying the speech that 4- to 5-year-olds addressed to unrelated 2-year-olds, Sachs and Devin (1976) similarly found that the older children modified their speech compared to the speech they addressed to adults, but they did not ask as many questions of the 2-year-olds as did the mothers. Tomasello and Mannle (1985) also found that older siblings spent less time sharing the attentional focus of the young child. The suggested sources of these differences between the child-directed speech of older children and mothers include differences in the affection felt toward the younger child, differences in the motivation or interest in interacting with the younger child, and differences in the competence to engage the younger child (Dunn & Kendrick, 1982; Tomasello & Mannle, 1985).

Little is known about the characteristics of the conversations that

children older than 5 have with their younger siblings. Certainly, conversational competence increases with age, and interest in and affection toward a very young sibling may also increase, suggesting that the speech which siblings over age 5 address to young children may be more supportive. This possibility is particularly important to explore because it is siblings old enough to be caretakers who figure most prominently in arguments concerning the nature of sibling conversation and its relation to the role of conversational experience in language development.

According to Gleason (1973) the speech that 8-year-old children address to young children is more like maternal child-directed speech than is the speech of 4- and 5-year-olds. However, evidence also suggests that even older children differ from mothers in their child-directed speech. Harkness (1977) reported that among the Kokwet of rural Africa, 4- to 8-year-olds elicit less speech from younger siblings than do mothers, and they produce speech that is less complex syntactically than mothers' child-directed speech. Nwokah (1987) compared the speech of Nigerian mothers and their maids (8 to 12 years old) to the same infants and found that the maids spoke less overall, had shorter MLUs, used fewer declaratives, more imperatives, more wh-questions, and fewer yes or no questions. However, these maids were from a different social class than the mothers, making difficult the interpretation of the findings as age effects.

In the present study we compared the conversations that young older siblings (4 to 5 years old), old older siblings (7 to 8 years old), and mothers had with young children between ages 1½ and 3 years. The question asked was to what extent does the child-directed speech of 4- to 5-year-old and 7- to 8-year-old siblings share the characteristics of mothers' speech (that previous research suggests is supportive of language development). The three groups were compared in terms of the mean frequencies of these supportive characteristics in their speech. As a further means to determine the extent to which each group of older siblings reflects the interest in successful conversation thought to underlie the supportive qualities in maternal speech by adapting to their listeners, the correlations between characteristics of child-directed speech and listener age were calculated for each group.

METHOD

Subjects

The participants were 18 children between the ages of 1;6 and 3;0 (M = 2.20 years, SD = 0.45), their older siblings between the ages of 4;0 and 5;9 (M = 4.9 years, SD = 0.60), their older siblings between the ages of 7;0 and 8;10 (M = 7.81 years, SD = 0.55), and their mothers. The youngest children included 10 girls and 8 boys, the 4- to 5-year-olds included 9 girls and 9 boys, the 7- to 8-year-olds included 6 girls and 12 boys. All of the youngest children were the youngest children in their families. Five of them had one or more other older siblings and one had a twin.

All of the participants were white working-class and middle-class residents of southeastern Wisconsin who were recruited through newspaper articles and word-of-mouth. One additional family was videotaped but not included in the analyses because the 4-year-old in that family produced fewer than the 50 utterances (generally considered necessary for reliable estimates of speech characteristics).

Procedure

Dyadic interaction between the youngest child and each of the other family members in the study was videotaped in the participants' homes. The researcher provided a set of toys and instructed the mother or older sibling to play with the young child. The youngest child played successively with each older family member for 10 min each. This procedure was repeated on another day within the same week, with a new toy and a changed order in which the participants interacted, yielding a total of 1 hour of videotaped interaction for each family, 20 min for each dyad.

The toys, selected on the basis of pilot testing to be ones which invited joint play, were shape-sorting type toys and a Fisher Price action set. Two researchers were present during the taping sessions, allowing one to operate the video camera and the other to take notes on the dialogue. The mother was frequently present in the room while the siblings were playing, but she was instructed to avoid participating in their interaction. All the mothers complied with this request, although the children sometimes spoke to her or to one of the researchers.

The order in which the older family members played with the youngest child was varied across families and across days to insure that there were no differences among the groups in their average ordinal position. Of 36 tapings (18 families × 2 days), mothers were first for 14 tapings, second for 9, and third for 13; the 7- to 8-year-olds were first for 11 tapings, second for 15, and third for 10; the 4- to 5-year-olds were first for 11 tapings, second for 12, and third for 13. The interactions were transcribed by the second author and one other trained research assistant following the conventions for the use of the Systematic Analysis of Language Transcripts (SALT) program (Miller & Chapman, 1985). The tran-

scripts of both days were combined so that the data to be presented are based on a total of 20 min of interaction from each dyad.

Measures

The selection of measures was guided primarily by the literature on the effects of maternal speech on child language development and secondarily by the literature on the adjustments in maternal speech to the child's age. Studies of conversational support suggest that the amount of time spent in joint interaction and the rates of conversation-eliciting questions, recasts of prior utterances, and topic-continuing replies to the child are positive predictors of the rate of child language development. The rate of behavior directives in child-directed speech may be a negative predictor of language development. Existing data on adjustment provide less guidance in the selection of measures because of little overlap among studies of adults' adjustment to the child in the measures of speech that have been used. Of the measures suggested to be related to language development, the evidence is that rates of conversation eliciting questions and topic-continuing replies increase with children's age and that the rate of directives decreases (Hoff-Ginsberg, 1987; Pemberton, Watkins, & Murray, 1990). Measures not implicated in the conversational support literature but commonly found to correlate with listener age are the amount of speech, its syntactic complexity, and its lexical diversity (e.g., Bellinger, 1980; Fraser & Roberts, 1975).

Based on these findings, then, the following measures were calculated for each transcript:

1. *Total number of utterances:* the number of utterances produced by the older conversational partner (mother, 7- to 8-year-old, or 4- to 5-year-old).

2. *Mean length of utterance (MLU):* the average length of all of the older speaker's complete and intelligible utterances counted in morphemes.

3. *Number of word roots:* the number of different words that the older speaker produced ignoring inflections so that *walks, walked,* and *walking,* for example, would be counted as one root.

4. *Rate of directives:* the percentage of the older speaker's utterances that were judged to be intended to direct the child's attention or behavior. These categories were part of a comprehensive system for coding speaker intentions that has been fully documented elsewhere (e.g., Hoff-Ginsberg, 1986; McDonald & Pien, 1982).

5. *Rate of conversation-eliciting utterances:* the percentage of the older speaker's utterances that were judged to be intended to elicit a verbal response from the child. This category includes several subcategories drawn from the same code as the measure of directives (e.g., Hoff-Ginsberg, 1986, 1990; McDonald & Pien, 1982).

6. *Rate of child recasts:* the percentage of the older speaker's utterances that expressed the same semantic content of an immediately prior child utterance in a different syntactic form (e.g., Nelson et al., 1984).

7. *Rate of self-recasts:* the percentage of the speaker's utterances that were recasts of his or her own immediately prior utterance.

8. *Percentage of child utterances given a topic-continuing reply:* utterances which were immediately followed by an utterance by the other speaker which met one of the following criteria: (a) it referred to an entity or event referred to in the child's utterance; (b) it was an answer to a question; (c) it continued patterned speech such as a nursery rhyme; (d) it commented on objects or event referred to in the child's utterance; or (e) it was a paraphrase of the prior utterance (e.g., Hoff-Ginsberg, 1987).

9. *Time in joint attention:* the total amount of time both conversational partners were focused simultaneously on the same object or activity (e.g., Tomasello & Farrar, 1986; Tomasello & Todd, 1983).

Reliability

The reliability of the measures used in the present study depended on both the accuracy of the transcripts made from the videotapes and the consistency with which the transcripts were coded. The tapes were transcribed by trained and experienced research assistants, including the second author. To further insure the accuracy of the transcripts, each was checked against the videotape two times in the course of coding, once by the original transcriber and once by a another research assistant or by the first author. To maximize the consistency of the coding, each coding scheme was applied to the transcripts by no more than two different coders.

For the measures of speech characteristics, interrater reliability was calculated between one of the coders and the first author, and then the second coder was trained until she or he also met that level of reliability. Interrater agreement for the utterance function code which yielded the measures of behavior directives and conversation-eliciting utterances was 82%, and Cohen's kappa (unweighted) was .80, both based on 201 coded utterances. (These two measures were part of a more comprehensive scheme for coding utterance function, and each measure was a superordinate category which included two or more subcategories in that scheme [e.g., McDonald & Pien, 1982].) Interrater reliability was calculated for the full 17-category system.) For the two-category recast code (i.e., recast or not recast) the rate of agreement was 97% and Cohen's

kappa (unweighted) was .78, based on 910 coded utterances. For the code which yielded the count of topic-continuing utterances, the rate of agreement was 87% and Cohen's kappa (unweighted) was .80, based on 220 utterances coded as topic-continuing, not topic-continuing, or uncodable.

Interrater reliability for joint attention could not be assessed in terms of rate of agreement because the interaction as it proceeded in time did not come in discreet units to code. Interrater reliability for the joint attention code was assessed instead in terms of agreement on the total percentage of the observation period that the dyad was judged as in joint attention. Reliability for the two coders was assessed on videotapes of mother-child play collected for another study which was conducted at the same time as the present study. Each of the coders independently coded six segments of 15 to 20 min of interaction. Their judgments of the total percentage of time in each interaction that was spent in joint attention were always within 8% of each other, and the correlation between their estimates across the six transcripts was $r = .98$.

The foregoing procedures insured that the transcripts were accurate renditions of the interactions and that the coding schemes employed could be applied in consistent manner. These procedures, in and of themselves, did not protect against the possibility of systematic bias in that the coders could not be blind to the age of the young child's conversational partner. One argument against the likelihood of bias is that the coders were unaware, by in large, of any particular hypotheses to be tested, and indeed, the purpose of the study was more to determine how these conversational partners compared than to test any strong hypotheses about their differences. Secondly, our intuitions from coding is that there is a tendency to lower the criteria for any code (i.e., Is this joint attention? Is this topic-continuing?) the less there is of that particular characteristic. We attempted to minimize this tendency to drift, but, to the extent it occurred, it produces a bias against finding differences.

RESULTS

The means for each measured characteristic of child-directed speech and the time spent in joint attention are presented in Table 1, along with the results of the between-group comparisons.

First, intercorrelations among the nine measures were examined to see if there were redundant measures which could be combined. (The full correlation matrices are available from the authors.) Although significant correlations were found among the measures for each speaker group, the particular variables that were correlated were different for each group. In

Table 1. Means (and Standard Deviations) of Measures Applied to Mothers' and Older Siblings' Interactions with Toddlers

Measure	Mothers		Ages 7–8 Siblings		Ages 4–5 Siblings	
Number of utterances	368	(110)	291	(115)	176	(118)
MLU	3.62	(0.47)	3.21	(0.54)	2.95	(0.52)
Number of word roots	211	(23)	161	(57)	101	(46)
Rate of directives	0.22	(0.09)	0.28	(0.11)	0.27	(0.14)
Rate of conversation-eliciting utterances	0.32	(0.07)	0.14	(0.11)	0.08	(0.06)
Rate of child recasts	0.030	(0.020)	0.008	(0.011)	0.002	(0.004)
Rate of self recasts	0.026	(0.011)	0.029	(0.018)	0.016	(0.015)
Percentage of child utterances given topic-continuing reply	32	(12)	15	(10)	8	(6)
Time in joint interaction (min)	9.98	(3.97)	5.31	(2.82)	2.83	(1.96)

Note. Underlining connects means that are not significantly different.

fact, among the measures employed in the present study, no two speech characteristics were significantly related for the mothers, the 7- to 8-year-olds, and the 4- to 5-year-olds. This lack of convergence among the intercorrelations for the three groups suggests differences among the conversational styles of 4-year-olds, 8-year-olds, and adults that the analyses of frequency and adjustment planned for the present study did not address. However, the multivariate analyses required to investigate those differences properly were beyond the scope of the present study. The apparent differences among the groups in the structure of conversational style were handled in this study by conducting between-group comparisons separately for each measured characteristic of child-directed speech.

For each measure, statistical tests of the significance of the differences among groups was accomplished by using paired-sample *t* tests for each of the three pairwise comparisons (7- to 8-year-olds to mothers, 7- to 8-year-olds to 4- to 5-year-olds, and mothers to 4- to 5-year-olds). This data analytic strategy was selected, rather than using ANOVAs followed by post hoc tests, because the question that was asked required explicit comparison of the group of 7- to 8-year-olds to both other groups. The outcome of an overall test of the effect of age would not be particularly interesting. The Dunn-Bonferroni procedure was employed to adjust the Type I error probability of .05 for each dependent variable for the three comparisons made; this resulted in a per contrast alpha of .0167.

The mothers were significantly different from the 4- to 5-year-olds on every measure except the proportion of their utterances that functioned as behavior directives. Compared to the 4- to 5-year-olds, the mothers produced more utterances, $t(17) = 6.07$, $p < .001$; utterances with a longer mean length, $t(17) = 4.35$, $p < .001$; more word roots, $t(17) = 8.52$, $p < .001$; proportionately more conversation-eliciting utterances, $t(17) = 13.18$, $p < .001$; proportionately more recasts of toddler utterances, $t(17) = 6.05$, $p < .001$; proportionately more self-recasts, $t(17) = 3.95$, $p < .001$; and responded to a greater proportion of the toddlers' utterances with topic-continuing replies, $t(17) = 8.37$, $p < .001$. Lastly, they spent more time in joint interaction with the young child, $t(17) = 8.56$, $p < .001$.

For every measure but two (where the differences were not significant), the means for the 7- to 8-year-olds were between those of the mothers and the 4- to 5-year-olds. The 7- to 8-year-olds were significantly different from the mothers on six of the nine measures and significantly different from the 4- to 5-year-olds on five measures. Compared to the mothers, the 7- to 8-year-olds produced sentences with a shorter mean length, $t(17) = 3.49$, $p < .01$; fewer word roots, $t(17) = 3.47$, $p < .01$; fewer conversation eliciting utterances as a proportion of their total utterances, $t(17) = 7.26$, $p < .001$; proportionately fewer recasts of the toddlers' utterances, $t(17) = 4.06$, $p < .001$; and responded to a smaller proportion of the toddlers' utterances with topic-continuing replies, $t(17) = 5.59$, $p < .001$. Lastly, they spent less time in joint interaction with the young child, $t(17) = 7.78$, $p < .001$.

Compared to the 4- to 5-year-olds, the 7- to 8-year-olds produced more utterances in total, $t(17) = 4.33$, $p < .001$; more word roots, $t(17) = 5.36$, $p < .001$; proportionately more self-recasts, $t(17) = 2.97$, $p < .01$; and responded to a greater proportion of the toddlers' utterances with topic-continuing replies, $t(17) = 3.64$, $p < .01$. Lastly, they spent more time in joint interaction, $t(17) = 4.13$, $p < .001$.

The extent to which the mothers and the two sibling groups adjusted their speech depending on the age of their listener was assessed by calculating for each group the correlations between each measured characteristic of child-directed speech and the listener's age. The values of the Pearson *r*s are presented in Table 2.

For the mothers, five out of eight characteristics of their speech were significantly related to the age of their listener. The mothers produced fewer utterances, proportionately fewer self-recasts, and proportionately fewer directives the older their listener. The mothers' rates of conversation eliciting utterances and recasts of child speech increased with increases in child age. Only one characteristic of the 7- to 8-year-olds'

Table 2. Correlations Between Characteristics of Mothers' and Older Siblings' Child-directed Speech and Addressee's Age ($n = 18$)

Characteristic of Child-directed Speech	*Mothers*	*Ages 7–8 Siblings*	*Ages 4–5 Siblings*
Number of utterances	−.53*	.20	−.20
MLU	.29	.36	.42
Number of word roots	−.00	.45	.10
Rate of directives	−.56*	−.30	−.32
Rate of conversation-eliciting utterances	.56*	−.19	−.23
Rate of child recasts	.65**	−.22	−.00
Rate of self recasts	−.58*	−.58*	−.43
Percentage of child utterances given topic-continuing reply	−.02	−.25	−.06

*$p < .05$ (two-tailed). **$p < .01$ (two-tailed).

speech was related to the age of their listener. They, like the mothers, produced fewer self-recasts as a proportion of their utterances with increasing age of the child to whom they were talking. None of the characteristics of the 4- to 5-year-olds' speech was related to their listener's age.

DISCUSSION

The significant differences observed in the present study between the mothers and the 4- to 5-year-olds in the frequency of supportive characteristics of child-directed speech are consistent with previous descriptions of preschoolers' speech as not particularly supportive of language development in a younger child. The significant differences observed between 7- to 8-year-olds and both the mothers and the 4- to 5-year-olds suggest two conclusions: Seven- to 8-year-olds provide more supportive interactions to their young language learning siblings than do 4- to 5-year-olds, and 7- to 8-year-olds provide less supportive interactions than mothers.

The first conclusion is based on the finding that the 7- to 8-year-olds differed from the 4- to 5-year-olds in the direction of providing more supportive interactions on five of nine measures. Furthermore, the only measures where the 7- to 8-year-olds were not significantly different from the 4- to 5-year-olds were directives, where no significant differences were found at all, probably reflecting the common influence of the toy playing task on the interactions (Hoff-Ginsberg, 1989); conversation-eliciting utterances, where the differences came close to meeting the criterion for statistical significance ($p = .03$); child recasts, which were

extremely low frequency in all groups; and MLU, which is not usually found to predict language development.

The second conclusion is based on the finding that the 7- to 8-year-olds differed from the mothers in the direction of less support on six of nine measures. The measures on which no difference was found were the total number of utterances, directives, and rate of self-recasts, the latter being very low frequency as well.

The correlations which were observed between listener age and characteristics of the child-directed speech of mothers, 7- to 8-year olds, and 4- to 5-year-olds suggest that mothers adjust their speech to their listener more than do siblings, and that old older siblings do not differ from young older siblings. However, these correlations may be misleading. An alternative interpretation of the lower and mostly nonsignificant correlations between characteristics of siblings' child-directed speech and listener age, in contrast to the several significant correlations between maternal speech and listener age, is that the age differences within each sibling group were a source of variance in the older children's speech that was not present for the mothers. To the extent that is true, the present findings imply that young children can expect more consistency in the speech directed to them by different adults than in the speech directed to them by different older children, but the findings do not necessarily imply a lack of adjustment to their listener by individual children.

Furthermore, the implications of the correlational data for the value of children as conversational partners depends not only whether or not adjustment occurs but also on the nature of those adjustments. In that regard, it is not clear just what sort of adjustment is reflected in the presently observed correlations between the mothers' speech and their children's ages. Many of the correlations seem interpretable as direct influences of children's talkativeness on their mothers' conversational behavior, rather than as reflections of some cognitively-mediated process of adjusting speech to match the child's ability. That is, within the group of 1½- to 3-year-olds, older children talked more than did younger children (the correlation between child age and number of utterances produced in conversation with their mothers was $r = .75$). Perhaps the mothers talked less, repeated themselves less, elicited conversation from the child more, and recast child utterances more in response to the older children carrying more of the conversation. This interpretation suggests that the source of whatever lack of adjustment by siblings there may have been was possibly a lack of enthusiasm for the task of interacting with their younger sibling rather than a cognitive inability to take account of their listener.

The data also suggest that the youngest children reciprocated their older siblings' apparent lack of enthusiasm for interaction. The young children talked less with their siblings than with their mothers: The mean number of child utterances produced was 229 ($SD = 70$) in conversation with the mothers, 160 ($SD = 70$) in conversation with the 7- to 8-year-olds, and 145 ($SD = 62$) in conversation with the 4- to 5-year-olds. Also, unlike the positive relation observed between the children's ages and the amount of speech they produced in conversation with their mothers, there was no relation between child age and amount of speech produced in conversation with either the 7- to 8-year-old siblings ($r = .24$) or the 4- to 5-year-old siblings ($r = .26$).

In sum, the correlational data do not provide a clear picture of what sort of adjustment to the listener is made by mothers and by older siblings, nor do they suggest how useful to language development such adjustment might be. However, these data do suggest that mothers are more successful at sustaining conversation with their young children than are older siblings. This difference itself implies a difference in the value for language development of mothers and older siblings as conversational partners.

The findings of the present study hold two implications for future research and for the theoretical debate concerning the role of social interaction in language development. First, the finding that siblings of both ages provide less supportive interaction than mothers suggests that if language acquisition does depend on the putatively supportive properties of maternal speech, then language development may proceed more slowly to the extent that the young child depends on older children as conversational partners. Some evidence of birth order effects on language development is consistent with this implication. Also, evidence exists that the amount of time children in day care spend in dyadic interaction with an adult, rather than with other children, is a positive predictor of their language development (McCartney, 1984).

Furthermore, because language skills are a component of most tests of general intelligence and because social interaction has general influences on cognitive development, birth order and family configuration effects on intellectual performance may also reflect the sorts of differences observed in this study. The present findings are consistent with the assertion of the confluence model that processes that operate within the family contribute to the observed aggregate correlations between birth order and intellectual performance (e.g., Zajonc & Bargh, 1980; Zajonc & Markus, 1975; but see Rodgers, 1988, for an opposing view). More specifically, the present findings provide an example of how not only the presence of siblings, but also the ages of the siblings, can influence the intellectual environment in a family.

An important caveat must accompany this discussion: The somewhat

unfavorable comparison of siblings to mothers which emerged from this study is in terms of characteristics first identified in mothers' speech. There may be other characteristics of the interactions that young children experience with their older siblings that benefit language growth in other ways. For example, Mannle and Tomasello (1987) suggested that because young children may have more difficulty being understood by their older siblings, they may be forced to develop new communicative strategies. In this way, older siblings may serve as linguistic bridges toward more effective communication with peers.

Dunn and Shatz (1989) found that 2-year-olds respond to speech between their mothers and siblings by intruding on these conversations, and triadic interaction may provide the young child with a model of turn-taking systems and social uses of language as well as illustrations of linguistic devices such as pronoun usage (Peters, 1983; Wellen, 1985). Thus, the presence of older siblings or other children also may provide the young child with language-learning opportunities. Future research on the influence of siblings on language development needs to take into account both siblings' provision of the kinds of support that adults provide and also siblings' potentially unique contribution to the language learning environment of young children.

A second implication of the present study is that because of the finding that 7- to 8-year-olds differ from 4- to 5-year-olds, results of research on young children cannot be extrapolated to yield conclusions about the value of children in general as conversational partners. This in turn, suggests that the existence of cultures in which older children, not mothers, care for young children is not sufficient grounds on which to reject the proposal that language acquisition depends on environmental support. The old older siblings in the present study produced significantly higher levels of support than did the young older siblings who more closely matched the age of children in previous studies on whom the most dismal views of the value of sibling speech have been based. Furthermore, in other cultures in which children are more socialized into caregiving roles and where the young caretakers are aunts and cousins rather than siblings, these older children may provide more supportive interaction than did the subjects of the present study.

Descriptions of non-Western and nonmainstream cultures in which older children serve as primary caretakers for language learning children provided a major impetus for the present study of older siblings. However, there are little data from such cultures to bring to bear on the implications of the present findings. To use cross-cultural data properly to address the role of social interaction in language development, future research needs to describe, in quantitative terms, both the characteristics

of child-directed speech in different groups and its relation to children's development of language.

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