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Joint attention and lexical acquisition style*

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ABSTRACT

Recent research has documented systematic individual differences in early lexical development. The current study investigated the relationship of these differences to differences in the way mothers and children regulate each other's attentional states. Mothers of 6 one-year-olds kept diary records and were videotaped with their children at monthly intervals as well. Language measures from the diary were related to measures of attention manipulation and maintenance derived from a coding of the videotaped interactions. Results showed that when mothers initiated interactions by directing their child's attention, rather than by following into it, their child learned fewer object labels and more personal-social words. Dyads who maintained sustained bouts of joint attentional focus had children with larger vocabularies overall. It was concluded that the way mothers and children regulate each other's attention is an important factor in children's early lexical development.

In 1973, Katherine Nelson published a study of 18 children which documented the fact that not all children learn language in the same way. She identified a single stylistic dimension along which these individual differences fall: referential to expressive. Predominantly referential children acquire large, nominally-based (i.e., having many object names) vocabularies early in development. Their subsequent syntactic development consists of learning to combine these words into meaningful combinations. Predominantly expressive children, on the other hand, have smaller vocabularies, with higher proportions of non-nominal words, especially pronominals and personal-social expressions like 'Please' and 'Thank-You'. These children often learn a variety of global phrases (e.g., 'Lemme-see' and 'I-wanna-do-it') along with their early words. Consequently, their subsequent development involves not only putting together words into sentences, but also breaking down the global phrases into their constituent lexical items.

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The majority of research on individual differences in early language has focused on the child's vocabulary – both in terms of 'competence', as measured by overall vocabulary size, and in terms of 'style', as measured by the relative proportions of the various types of word and the child uses (see Nelson 1981 for a review). Though this is the most well-documented dimension of individual difference in children's early language, there is very little research on the social and environmental influences which lead children to learn different numbers and types of word early in their lexical development. In her original 1973 study, Nelson found that referential children tended to be first-born and/or from more highly educated families, while expressive children tended to be later-born and/or from less highly educated families. These are of course only very gross sociological variables, and so Nelson hypothesized several underlying social-interactional variables. The most important of these was 'active control' by the mother – an interaction style in which the mother attempted to impose her conversational topic on the child – which was found to be detrimental to early language development.

Recent research has attempted to specify these social-interactional variables in more detail. Furrow & Nelson (1982) investigated differences in the speech of mothers of referential and mothers of expressive children, the children's stylistic category being determined mainly by their relative use of nouns and pronouns. Contrary to what might be expected, mothers of referential children did not use more nouns when speaking to their children, nor did mothers of expressive children use more pronouns. In fact, no measure of the content or the structural characteristics of the mothers' speech was systematically related to the child's acquisition style. What was found to be related to acquisition style were mothers' references to objects and persons, regardless of the linguistic characteristics of that reference, such that mothers of referential children made more references to objects. The relationship was a complex one as style interacted with the child's mean length of utterance (MLU). Nevertheless, the results suggested to the investigators that acquisition style is less closely related to the linguistic form of the mother's speech than it is to how and for what purposes she uses her language. A similar finding using nonverbal measures of maternal behaviour is reported by Ruddy & Bornstein (1982). They found that mothers who more frequently drew their child's attention to objects at four months of age had children with larger vocabularies at 12 months of age.

Della Corte, Benedict & Klein (1983) investigated the same question in a slightly different way. They selected the five most referential and the five most expressive children from a sample of sixteen and coded their mothers' speech to them on both linguistic and pragmatic dimensions. No significant differences were found between the two groups of mothers in terms of the

linguistic form of their utterances, but rather the major finding of the study was in the pragmatic domain. They found that mothers of referential children used more descriptive expressions to name, comment on, or describe aspects of the situational context. Conversely, mothers of expressive children used more prescriptive expressions to direct or manipulate their child's attention or behaviour. The number of nominal words in the children's vocabulary – a high number indicating a referential child – correlated positively with the proportion of mother descriptives and negatively with the proportion of mother prescriptives. Further evidence along these lines is provided by Chesnick, Menyuk, Liebergott, Ferrier & Strand (1983) who found that it was the pragmatic rather than the linguistic features of the mother's speech at 16 months that predicted the child's linguistic competence at 22 months.

These findings all suggest that it is not so much what the mother says to her child that affects early lexical development, but rather it is how she says it. Nelson (1981) proposed that these different styles of language use by mothers lead to different child language acquisition styles by suggesting to the children certain hypotheses about what language is used for. Because their mothers use language primarily to name and describe the world, referential children come to use language primarily as a conceptual tool for making sense of their environment. They learn a variety of object names to help them in this task. On the other hand, a child who experiences language in mostly regulative and expressive contexts will come to learn that language is mainly useful for regulating interactions with other members of their social group. Their early words then will tend to be of the personal-social variety. This 'functional' hypothesis is certainly plausible and it is consistent with the available data. However, it may not be the whole story.

Another set of factors that may be involved is the different language learning conditions set up by different maternal styles. It may be that certain of the conditions necessary for the child to learn a word may be present only for certain types of word when a particular mother interacts with her child. One of these necessary conditions for word learning in the earliest phases of development is the establishment of some type of joint attentional focus. As Bruner (1981) has emphasized, early language acquisition takes place mostly in the context of parent-child routines or 'formats'. The essential aspect of these interactions is that they are recurrent interactions, whose structure is already familiar to both mother and child. This makes it possible for the child to know where the adult's attention currently is focused and where it is likely to be focused next. Therefore any language the adult may use in such a context is likely to be immediately meaningful to the child, and language used outside such a context is likely not to be meaningful. If these types of interaction are as important as previous research would indicate

(e.g. Ratner & Bruner 1978, Ninio & Bruner 1978), then different styles of joint interaction should affect the way individual children learn language. The purpose of the current study, therefore, was to determine whether and in what ways individual differences in lexical acquisition style are influenced by the way these interactions are initiated and maintained.

The current study had two hypotheses about the way lexical acquisition is affected by processes of attention regulation in mother-child dyads. First, it was hypothesized that mothers who initiated interactions with their young children by following into their already established focus of attention would have children with larger, more nominally-based lexicons. Conversely, children whose mothers initiated interactions by attempting to direct the child's attention anew would have smaller, less nominally-based lexicons. This is a more general formulation (because it refers to all social, including linguistic, interactions) of the Della Corte *et al.* Finding that referential children had mothers who used more descriptives and less prescriptives in their linguistic interactions with their children. It is consonant with Nelson's (1973) proposal that 'active control' by the mother is not conducive to early language development.

This hypothesis is also reasonable if one thinks of the process of word learning, early in development at least, as necessarily requiring the establishment of a joint attentional state. If the very young child is already focused on something, then insofar as the parent is successful in determining the child's focus of attention, following into that focus and supplying a language model would seem to be an effective didactic method. This method seems especially well-suited to learning the names of real-world referents because in this case the adult should have little trouble determining where the child's attention is focused. In contrast, if the child is directed to some other object – either just before or by using some piece of language – this is not an optimal interaction for establishing joint attention with an object because now it is the child who must discern where the adult's attention is focused. Clearly, in the beginning, the adult is better at this than the child. The expectation, therefore, was that when the mother's style was to initiate interactions by directing attention, the child's vocabulary will be smaller overall with fewer object words. Very likely, in this case the child's earliest words will involve expressive-interpersonal meanings, which do not require to the same extent that the child determine where in the environment the adult's attention is focused.

Second, it was hypothesized that children of dyads which engage in sustained joint interactions for longer periods of time will have larger, more nominally-based vocabularies. This follows from Bruner's research into the role of 'formats' in the language learning process. A dyad's ability to maintain an interaction with a joint focus of attention would seem to be

conducive to providing salient language models, since these interactions often presume that the child is aware of the adult's current state of attentional focus. This means that any language models provided by the parent in this interactive context will be easier to relate to their appropriate real-world referents. Moreover, because most of these type interactions involve objects as their focus of attention, much of the linguistic interaction centres around them and hence many of the adult models will concern objects and their properties.

A corollary of this hypothesis is that children of dyads who maintain their joint attentional states with equal participation by both parties, rather than by the adult dominating or 'leading' the focus of the joint interaction, will have larger vocabularies. This type of joint interaction means that the child is 'holding up his or her end' and thus is aware of its 'topic'. Those in which the mother does everything to maintain the interaction, 'active control' in Nelson's terminology, and the child is relatively passive will be associated with smaller, more expressive vocabularies.

METHOD

Subjects

Subjects for the study were six middle-class mother child dyads recruited from the Atlanta area by means of an advertisement in a campus periodical. All of the children were between 12 and 13 months of age when the study began. Three were first-born (two males, one female), and three were later-born (two males, one female). None of the mothers worked and none of the children attended day care on a regular basis.

Procedure

Each mother-child dyad was followed for a period of five months. Each dyad was visited at weekly intervals by a research assistant. On alternate weeks mother and child were videotaped in a naturalistic play setting.

Language Measures. Mothers were informed that we were interested in their child's language development. They were instructed in how to keep a continuous diary record of their child's utterances. They were to record any occurrence of a new expression, along with its situational context and likely adult modelling situation. In addition, they were to record any new uses of established expressions. These diary records were supplemented with weekly interviews where each of the mother's diary entries was discussed and clarified to the research assistant's satisfaction. Further, it was determined from these interviews which of the child's established words were still in active use and how they were being used. (These are words that might cease appearing as diary entries because they are always used in

the same context.) Also, dyads were videotaped every two weeks and the verbal interactions transcribed. Mothers were asked about any expression occurring on the tape that was not in the diary record.

All of the language measures used (except for one used in a supplementary analysis which will be identified when presented) were based on the final vocabulary as recorded in the diary records. (Vocabulary estimates from the videotapes were computed, but not used. The correlation between diary and videotape estimates of vocabulary size was 92%, with the diary estimate being in all cases higher.) For a word to count in the diary estimates we required that it not be imitative and that we have more than one concrete instance reported. Using this final diary record, each of the child's words was placed into one of Nelson's (1973) six lexical categories: Specific Nominals, General Nominals (not including pronouns), Action Words, Modifiers, Personal-Social Words, and Functors. A proportion was then computed for each category for each child.

Social Interaction. Each dyad was videotaped every two weeks for the five month period, but only every other tape (monthly intervals) was used in the analysis. Each taping session lasted 30 minutes, with the mother and child, the assigned research assistant and a cameraman present. A standard set of toys was brought by the experimenters to each session. Mothers were given no specific instructions. They were told that our interest was in their child's language, not in them, and that they should simply do what they normally would do. Typically, mothers both played with their children and chatted with the research assistant in a seemingly natural way. It was felt that this 'participation' by the assistant would help to assure mothers that they were not 'on stage'.

The videotapes were coded by a team of two research assistants. The coding scheme was constructed in the following way. All behaviour that was not part of a social interaction was ignored. Social interactions were conceptualized as discrete events, in most (but not all) cases with identifiable durations. Each interaction was partitioned into an initiation phase, an interaction phase, and a termination, each of which was further partitioned into several subcategories. The conceptual basis for the subdivisions was in all cases the attentional focus of the participants and/or the attempted attentional manipulation of one participant by the other. Thus, the resulting categorization scheme was as follows:

Initiations

Mother Directs: Mother does something to request, direct, or manipulate the child's attention or behaviour.

Mother Follows: Mother actively joins into some ongoing activity of the child. (Includes verbal comments.)

Child Initiates: Child initiates the interaction in any manner.

Interactions

No Response: Initiation is not acknowledged.

Response: Initiation responded to with (usually brief) overt behavioural acknowledgement (including verbal).

Joint Interaction: Mother and child interact for at least three seconds, with both of them focused on the same object or activity. Child must overtly acknowledge Mother's participation with either a look to face or a verbalization directed to Mother. The three types are:

Mother Lead: Interaction is maintained due to Mother's active manipulation of child's attention or behaviour.

Child Lead: Interaction is maintained due to child's active manipulation of Mother's attention or behaviour.

Equal Lead: Interaction is maintained due to both participants active manipulation of each other's attention or behaviour. (This often involves some back-and-forth or reciprocal activity such as playing ball, reading, building tower together, etc.)

Termination

Child Terminates: Child disengages from interaction with Mother by shifting attention, leaving scene, etc.

Mother Terminates: Mother disengages from interaction with child by shifting attention, leaving scene, etc.

Other: Outside distraction interrupts interaction.

Reliability of the coding procedure was determined by comparing the coding output of a second team of coders for half of the tapes. The percentage of agreement for the subcategorization of initiations was 84%. Agreement for the subcategorization of joint interactions was 83%. The correlation of the two teams' assignment of durations for the joint interactions was significant at the 0.01 level (r=0.85).

RESULTS

Table 1 presents the language and the social interaction measures for each child. The two categories of social interaction measure, INITIATION and JOINT INTERACTION, are given as totals summed across all sessions, with their respective subcategories presented as proportional frequencies. The one category of language measure, VOCABULARY SIZE, represents the final diary estimate. The two subcategories are proportions of this total. These two subcategories were chosen for analysis from Nelson's (1973) six sub-

TABLE 1. *Social interaction and language measures for each subject*

	Initiations				Joint Interactions (Time)				Language			
	% Mother Direct	% Mother Follow	% Child Init.	Total Init.	% Mother Lead	% Equal Lead	% Child Lead	Total Joints	% Personal-Social	% General Nominals	Vocab. Size (Final)	Vocab. Size (Initial)
Claire	0.27	0.42	0.32	196	0.44	0.36	0.19	3433	0.03	0.66	90	6
Marcus	0.37	0.44	0.19	104	0.46	0.21	0.33	1354	0.11	0.42	19	4
Sebastien	0.17	0.23	0.59	128	0.05	0.18	0.77	1547	0.06	0.50	16	6
Jason	0.41	0.42	0.17	175	0.42	0.30	0.28	938	0.10	0.50	20	7
Heather	0.53	0.25	0.23	150	0.51	0.16	0.33	1207	0.50	0.13	8	2
Daniel	0.29	0.45	0.25	161	0.30	0.14	0.56	2510	0.15	0.45	20	6

categories because of their special relevance to the referential-expressive dimension. Note also that the subcategory General Nominals does not include pronouns, since these have lately been shown to be more related to an expressive acquisition style (e.g., Furrow & Nelson 1982).

The first hypothesis about the relationship between the language and social interaction measures was that children whose mothers initiated more by following into their child's focus of attention than by directing it would have larger, more nominally-based vocabularies. As can be seen in Table 2, all of the appropriate correlations are in the predicted direction and almost all are moderately large. Two are statistically significant: mother's who initiated by directing had children with a higher proportion of personal-social words ($r=0.79$) and a lower proportion of object names ($r=-0.75$). This contrast is all the more striking because all of the other correlations are consistent with it. None of the correlations with overall vocabulary size was significant. Thus, this pattern of relationships indicates that the way dyads initiated interactions was associated not with the child's overall competence, as measured by vocabulary size, but rather with style, in terms of the types of word in the child's vocabulary.

TABLE 2. *Correlations between social interaction and language measures*

	Vocabulary Size	% General Nominals	% Personal-Social
Initiations			
% Mother Direct	−0.34	−0.75*	0.79*
% Mother Follow	0.36	0.48	−0.47
% Child Init.	0.07	0.28	−0.31
Total Init.	0.65	0.39	−0.11
Joint Interactions			
% Mother Lead	0.19	−0.74*	0.44
% Equal Lead	0.79*	0.68	−0.51
% Child Lead	−0.49	−0.04	−0.13
Total Joints	0.84*	0.59	0.11
Success Rate			
Equal Lead	0.81*	0.23	0.05
Total Joints	0.59	0.27	−0.13

* $P<0.05$

The second hypothesis was that children who spent larger amounts of time in joint interactions, especially those in which there was equal participation, would have larger, more nominally-based vocabularies. The correlations in Table 2 between vocabulary size and the two appropriate joint interaction

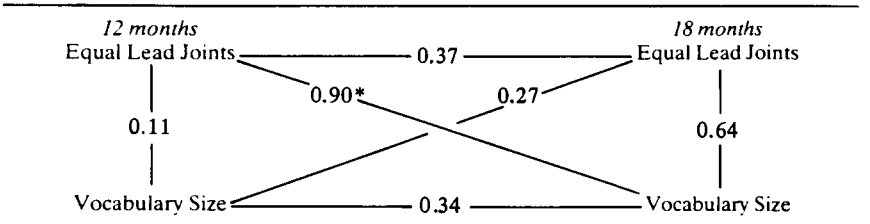
measures (Total Time in joint interaction and proportion of time in Equal Lead joint interaction) are both statistically significant. Children of dyads who spent more time in joint interaction had larger vocabularies. With regard to language style, though several of the correlations were moderately large and the pattern was consistent with the hypothesis, only one correlation was statistically significant: a negative correlation between proportion of time in Mother Lead joint interactions and proportion of nominals in the child's vocabulary. This is consistent with the finding with regard to initiations that a directive maternal style is associated with fewer nominals and more personal-social words. The pattern of correlations concerning interaction maintenance then, indicate that the dyad's ability to sustain joint interactions is related most strongly to competence, and to a lesser extent to style.

These correlations between joint attention and vocabulary size can of course be interpreted in more than one way. To help choose between the different possible interpretations, several further analyses were performed. First of all, it may be a concern that using the time spent in joint interactions brings in other variables such as the child's attention span, for example. However, analysis using the number of joint interactions, rather than amount of time, shows exactly the same significant correlations. Further, a 'success-rate' for the dyad's tendency to enter into a joint interaction was computed by taking the total number of INITIATIONS that resulted in JOINT INTERACTION and dividing by the total number of INITIATIONS (some of which resulted in No Response or Brief Response). This procedure was followed for total Joint Interactions and for Equal Lead Joint Interactions. These figures were then correlated with VOCABULARY SIZE and relative proportions of nominal and personal-social words. The correlations are presented at the bottom of Table 2. The statistically significant correlation indicates that dyads which were successful in entering into an Equal Lead joint interaction proportionally more often had children with larger vocabularies. These statistics provide further support for the relationship between JOINT INTERACTIONS and VOCABULARY SIZE because they rest on proportional frequencies and not in any respect on time. These 'success-rate' social interaction measures then are not sensitive to how much a given dyad interacts (because they are proportions) nor to the length of time they remain in joint interaction.

Thus the data clearly show a positive relationship between joint interactions and vocabulary size. A further concern, however, is that the correlations result very simply from the fact that a talking child is in joint interactions more, just by virtue of verbal discourse interactions with the mother. The first thing to note is that the vocabulary estimates come from the mother's diary records and not from the videotapes from which the social

interaction measures were taken; they are therefore statistically independent. Second, the total number of child verbal utterances on the tape does not correlate significantly with time in joint interaction ($P>0.35$). This would suggest that it is not the child's taking *per se* that maintains the interactions. And third, cross-lagged correlations with vocabulary size were computed both for time in Total Joint and for time in Equal Lead Joint interactions. (These were computed using the first and the last videotapes and the first and the last diary estimates of the four month period.) The results for Total Joints revealed no significant correlations. The results for Equal Lead joint interactions are presented in Table 3. Though the interpretation of cross-lagged correlations is somewhat controversial, the pattern

TABLE 3. *Cross-lagged correlations for equal lead joint interactions and vocabulary size*



* $P<0.01$

of correlations for Equal Lead Joints suggests that the style of interaction has some influence on later language competence: the cross-correlation between time in Equal Lead Joints and Vocabulary Size four months later is $r=0.90$, $P.<0.01$, whereas the converse cross-correlation is $r=0.27$. This result would indicate that, if anything, the joint interactions influence the child's language, and not the other way around.

DISCUSSION

A basic question of lexical development research is why children learn some words and not others. Parents often report that despite their most conscientious attempts their child does not learn a certain word. They also report that their child learns some words on the basis of a few, sometimes only one, adult model. Some children learn mostly object labels, others learn mostly words of personal expression. It is the basic assumption of the line of research represented by this study that there are specifiable factors in the social-linguistic environment of young children that account, at least in part, for these phenomena.

It is clear from previous research that precisely what the mother says to the child, in terms of its structural/linguistic features, is not responsible for individual differences in early lexical development. What matters is how she says it. Nelson's hypothesis is that the way adults use language suggests to the child certain hypotheses about the function(s) of language. The current study hypothesized that in addition to this functional explanation, an explanation in terms of the learning conditions, especially those involving attentional factors, may be appropriate. Mothers who provide models to their children as they are directing their attention to something new are less likely to establish the shared attentional focus with their child necessary for learning a word. When a model is provided which follows into the child's attentional focus, establishment of shared attention becomes more likely. The same reasoning applies when we consider, in addition to how interactions are initiated, how they are maintained. Sustained bouts of joint attentional focus with an object should lead to the child's learning of many early words, especially those referring to objects.

The results of the study provided support for this general line of reasoning. Without considering the mother's use of language at all, but only her and her child's style of attention regulation, it was found that certain social interaction styles are associated with particular features of lexical development. How mothers initiated social interactions was related to the relative proportion of object words and personal-social words in the child's vocabulary. A more directive maternal style was associated with more personal-social words and fewer nominals. How interactions were maintained – both in terms of how much time dyads spent in joint interactions and who dominated the interactions – was related most consistently to the child's overall vocabulary size. The more time spent in joint interactions of all types, and the higher proportion of that time spent in Equal Lead joint interactions, the larger the child's vocabulary. It was also found that when the mother tended to dominate the joint interactions, as indicated by a high proportion of Mother Lead joint interactions, the proportion of object words in the child's vocabulary was smaller. The general association between vocabulary size and joint interactions was a robust finding. There also was a statistically significant association when joint interactions were counted in terms of their frequency rather than time, and again when they were considered in terms of the proportion of interactions which resulted in joint attentional focus.

The alternative interpretations of these relationships are made less likely by the supplementary analyses. The correlations between vocabulary size and joint interactions are not simply a function of the more competent children talking more during the taping sessions; children who talk more on the tapes do not engage in more, or for a longer time, in joint interactions.

Further, cross-lagged correlations suggest that it is the dyad's ability to maintain joint interactions which affects lexical development, and not the other way around. This does not mean that the causality flows only from the environment to the child. How interactions are initiated and how they are maintained is clearly due as much to the child (e.g. the prerequisite cognitive abilities) as to the mother. The contention which the data support is simply that a mother-child dyad's spending of a greater amount of time in joint interactions leads to a child with greater language competence. What might be suggested then, is that dyads where the mother is 'willing' and the child is 'able' are more likely to engage in joint interactions – which are conducive to the provision of language models that are salient for the child.

Another alternative explanation might be that the correlations result from the fact that mothers who are disposed to engage in joint interactions with their infants also are disposed to be more conscientious in their reporting of language developments. Though this is of course possible, it does not seem likely because the estimate of VOCABULARY SIZE based on the videotapes correlates with the estimate of VOCABULARY SIZE based on the mother's diary reports at 0.92. This would seem to indicate that there were no systematic reporting biases in the mothers' diary records, a fact which may result in large part from the weekly questioning of mothers which served to keep them all relatively attentive.

It is also possible that the current findings, while internally valid, are not externally valid, but rather result form peculiarities of the children studied. Given the small sample size, this is a reasonable possibility. It is also true that the small sample size makes the use of parametric statistics somewhat problematic. Though neither of these concerns can be directly addressed by the current study, it nevertheless would seem that the results are strong enough and consistent enough to warrant further investigation using larger sample sizes. However, a study with a larger sample undoubtedly will have to face the problem of determining vocabulary size in some way other than the time-consuming diary/questionnaire method used here.

It should also be noted that the current study did not find birth order differences to be as substantial as those reported in some previous research (e.g., Nelson 1973). Only two children – Claire, first-born and referential, and Heather, later-born and expressive – clearly fit the existing profiles of referential and expressive children. This may be due, at least in part, to the fact that most of the children were not quite as far along linguistically as those described in current literature. Or alternatively, it may be that some aspect of the current methodology obscured birth order differences. Most likely in the current view, however, is that it is due to the nature of the mothers who volunteered for the study. The mothers of the later-borns in the current study were all upper-middle-class mothers who were very

interested in their child's development, and thus in many ways they were similar to traditional mothers of first-borns.

The relationships established by the current study may also be used to help explain the findings of existing research. Previous studies that have focused on the referential-expressive dimension of individual differences in children's early language have for the most part investigated features of the mother's language to the child. But it may be hypothesized that attentional regulation is an underlying factor in these findings as well. Thus, with regard to the Della Corte *et al.* finding of the importance of pragmatic factors, the mother's modelling of a word in a prescriptive manner, e.g., 'Get the ball and bring it here.', may make it difficult for the child to associate the object word and its referent. In this formulation the word is simply not in a salient position and the mother's intended referent must be inferred by the child (cf. Chapman 1981). A descriptive model, e.g., 'That's a ball.', delivered as the child is playing with it, may make the process much easier. In this case the word and referent are both much more salient to the child. On the other hand, the prescriptive models may be more conducive to word-meaning mapping than descriptive models when the meaning concerns an affective state, and indeed this is what the current data show.

The findings of this study help us to answer the question of why children learn some words that they are exposed to and not others. There are no doubt many factors involved: for example, the child's existing cognitive structures (Bates 1979, Tomasello & Farrar in press), the frequency and spacing of adult models (Schwartz & Terrell 1983), and the communicative functions of mothers' word use (Durkin, Rutter, & Tucker 1982). What this study has shown is that the way adult-child dyads establish and maintain joint attentional focus is also an important factor: individual differences in this factor lead to individual differences in early language acquisition style. This is not a foregone conclusion since, as Bates (1979) has argued, some prerequisite factors operate on a 'threshold' basis, such that a certain level is required, but anything over that level has no further effect. The finding of individual effects is therefore an important one.

Traditional lexical acquisition research on how word meanings are represented and how they change needs to be supplemented with research into how words are learned and used in social contexts. The study of individual differences in lexical acquisition is an integral part of this research because determining different input-output relationships in some detail will serve to elucidate the workings of basic processes of language development. The current study has attempted to contribute to this effort by establishing an important social-interactional variable that affects children's early lexical acquisition. It is hoped that further research into the types of variable studied here concerning attention regulation, in concert with those con-

cerning the nature of the language model provided, will contribute to an understanding of how chidren learn and use their early words.

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