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Language Patterns of Parents of Young Autistic and Normal Children[1]

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This study examined the language patterns of parents of 10 autistic children and parents of 10 normal children who were matched with the autistic children for language age, sex, and parents' educational level. Syntatic and functional aspects of parental language were assessed during a 20-minute interaction before the parents of the autistic children participated in a behaviorally oriented treatment program. Few significant differences emerged between the language of the parents of the autistic and normal children. The parents of the autistic children used more non-language-oriented language but did not differ from the parents of the normal children in the percentage scores for any language category. Also, although the parents of the autistic children spoke more often, complexity of language, as measured by mean length of utterance, was comparable across the groups. Several differences emerged between mothers' and fathers' language patterns. These results suggest that parents of autistic children provide language environments similar to those experienced by normal children in the initial stages of language development and that mothers and fathers play different roles in their child's language environment.

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Although deviant and delayed language development is perhaps the most debilitating aspect of autism, there has been little research on the language environments of these youngsters. Assessment of the adequacy of parental language models has implications for the treatment and etiology of autism. The significance of such research is heightened by the recognition that psychosocial factors are important determinants of the prognosis and course of autism (Cantwell, Baker, & Rutter, 1978) and that parents of autistic children can play an active role in the treatment of their children's language deficits (e.g., Davis & Marcus, 1980; Goldstein & Lanyon, 1971; Harris, Wolchik, & Weitz, 1981; Hemsley, Howlin, Berger, Hersov, Holbrook, Rutter, & Yule, 1978; Kozloff, 1973; Lovaas, 1978).

The results of the limited research on the language environments of severely developmentally disabled children are inconsistent. Several studies, focused on the communication patterns of mothers of children labeled as childhood schizophrenics, have suggested that these women serve as poorer language models for their children than do mothers of normal children matched for chronological age (e.g., Goldfarb, Goldfarb, & Scholl, 1966; Goldfarb, Levy, & Meyers, 1972; Goldfarb, Yudkovitch, & Goldfarb, 1973). Mothers of these children have been reported to be poorer at communicating meaning and mood (Goldfarb et al., 1966, 1972), to give poorer instructions and more ambiguous information, and to be less responsive to their children's requests (Goldfarb et al., 1973) than mothers of normal children. In contrast, Frank, Allen, Stein, and Meyers (1976) reported that mothers of relatively high-functioning and verbal autistic children and normal children used comparable percentages of good responses and non-responses to their children's questions, as well as comparable frequencies and percentages of questions.

Differences in experimental tasks and settings, coding procedures, and/or child's diagnosis may account for these discrepant findings. The frequent tendency to use the terms *childhood schizophrenia, childhood psychosis,* and *autism* interchangeably (Laufer & Gair, 1969) and the absence of operational diagnostic criteria in the studies by Goldfarb and his colleagues make it difficult to determine whether the children studied by Frank et al. are diagnostically distinct from those studied by Goldfarb et al. Nevertheless, all of the studies cited above employed a comparison group of children matched for chronological age. Several studies have demonstrated that maternal language is modified as the child's language abilities increase (e.g., Lederberg, 1980; Nelson, 1973; Philips, 1973; Seitz & Stewart, 1975; Snow, 1972). Therefore, chronological age-matched youngsters may not be an appropriate comparison group for assessing the adequacy of the language-impaired child's language environment. Instead,

a more appropriate comparison would involve children at a comparable level of linguistic development.

Cantwell, Baker, and Rutter (1977) attempted to control for the effect of the child's verbal abilities on maternal language by using a comparison group of children with developmental dysphasia. Comparison of a large number of functional and syntactic aspects of language revealed only two significant differences: The mothers of the autistic children made more affectionate remarks and fewer clarity errors than the mothers of the dysphasic children. Although Cantwell et al. (1977) conclude that the mothers of the autistic children use language typical of mothers of language-disabled children, it is possible that the language environment may play a role in maintaining the child's language deficit whether the child is autistic or dysphasic.

Howlin, Cantwell, Marchant, Berger, and Rutter (1973) have suggested that the low frequency of language in autistic children may be associated with a language environment characterized by a lack of reinforcement for vocalization, a lack of encouragement to speak, and a lack of correction of language. The results of a recent study by Wolchik and Harris (1982), which controlled for the child's level of language development in the autistic and normal samples, did not support the hypotheses of Howlin et al. (1973). Comparison of the language patterns of four couples with an autistic child and four couples with a normal child revealed only one significant difference: The parents of the normal children used a greater proportion of adult-directed language. While these results suggested that the parents of these autistic children provided language environments similar to those of the normal children, these autistic children had been enrolled in an intensive behavioral treatment program for at least 2 years and had acquired some spontaneous language. Further, their parents had been taught the principles of behavior management, and it is possible that parental use of these techniques generalized to language interactions with the children. Thus, the autistic child's treatment experience and/or the parents' training may have been responsible for the parents' level of encouragement of and responsiveness to their children's language. Finally, the autistic children in this study averaged 7½ years in age.

The two studies that have controlled for the effect of the child's level of language on the language environment (Cantwell et al., 1977; Wolchik & Harris, 1982) have studied children with at least some functional language who were 6 or older. In order to understand the role that parents might play in the development of their children's language deficits, assessment of the child's early language environment is critical. Similarly, attention to the language environments of children with very limited verbal

abilities is important, because a child's level of linguistic sophistication affects a language environment and because approximately half of all autistic children have such limited verbal abilities (e.g., Rutter, 1966). To date, the language environments of preschool-aged autistic children with very limited verbal abilities have not been examined.

Another area that has received little empirical attention is the role of the father in his autistic child's language environment. With the exception of the study by Wolchik and Harris (1982), research on the language environments of autistic subjects has focused exclusively on maternal language. Recent research with normal, language-learning children (e.g., Friedlander, Jacobs, Davis, & Wetstone, 1972; Masur & Gleason, 1980; Vandell, 1979a, 1979b) has suggested that mothers and fathers may play different roles in their children's language acquisition. Therefore, attention to fathers as well as to mothers is necessary to understand the autistic child's language environment and, eventually, the contribution that mothers and fathers make to their child's language development.

The present study had the following goals: (1) to assess the adequacy of the language environments of preschool-aged autistic children with very limited verbal abilities by comparing their language environments to those of normal children with comparable levels of language development before either the parents or their autistic children had participated in a treatment program, and (2) to compare the language patterns of mothers and fathers.

METHOD

Subjects

Ten mothers and 10 fathers of autistic children participated in the study. All of these parents were scheduled to participate in a 10-week behaviorally oriented parent training program. These parents were recruited through letters to professionals and paraprofessionals involved in evaluating and teaching autistic children in the northern and central New Jersey and Staten Island areas.

After the referral was made, a telephone interview was conducted to determine whether the child met the following criteria: (a) was between 2 ½ and 6 years old, (b) had little or no language, (c) exhibited disturbed interpersonal relationships, (d) posed management or behavioral problems in addition to severe language deficits, (e) had not received a primary diagnosis of pure retardation, (f) did not have a medical condition indicative of a progressive disorder, and (g) was not receiving intensive language training.

Of the first 13 families who met these criteria, 12 were selected for the parent training program. One family was excluded because the father's psychological problems were severe enough to interfere with participation. Two of the 12 families in the parent training program were not included in the present study since one of the couples had recently adopted their child and the other child was diagnosed as language-delayed rather than autistic. The 10 children whose families were included in the present study exhibited all the NSAC cues of autism (NSAC, 1978).

The comparison group consisted of 10 mothers and 10 fathers of normal children who were recruited through letters to parents of children enrolled in nursery school, signs in libraries and grocery stores, and an article in a local newspaper. These subjects were matched with the families of the autistic children on the basis of child's language age, sex, and socioeconomic status, as measured by parents' level of education. To match for language age of the autistic children whose language was limited to sounds, mothers of normal children were asked whether their child used any words or sounds to denote specific objects; subjects whose verbal behavior was limited to babbling were selected. For the autistic children whose language included words, mean length of utterance estimates (Brown, 1973) were employed to select comparison subjects. One of the comparison families dropped out after the first videotape session, and another family was selected to replace them. Families in the comparison group were paid $10 per session.

The average age of the autistic children was 46.6 months (range = 29-74 months) and average IQ, as measured on the Developmental Profile (Alpern & Bolls, 1972), was 46.6 (range = 25-77). The average age of the children in the comparison group was 11.1 months (range = 6-25) and the average IQ in this group was 122 (range = 85-200). The two autistic children with some language had mean length of utterance estimates of 1.0 and 1.5, while their matched comparison subjects had mean length of utterance estimates of 1.0 and 1.2.

The two groups did not differ on average length of mothers' or fathers' education. The mothers and fathers of the autistic children were significantly older than the mothers and fathers of the normal children ($t = 2.51, p < .05$; $t = 3.10, p < .05$).

Procedure

Assessment Procedures. As part of another study, parents of the autistic children were videotaped on two occasions prior to the videotape session conducted for the current study. The data used in the present study were collected in the home within 2 weeks before the treatment

program began. In order to equate for exposure to the videotaping and to the experimental task, the comparison families were also assessed on three occasions. These sessions, all at home, were scheduled over a maximum of 3 weeks, and data from the third session were used in the present study. Videotapes were made by a member of the parent training project staff, which included a clinical psychologist, several graduate students, and several undergraduate students.

Immediately before each interaction session, parents were told that the purpose of the experiment was to obtain an idea of how they and their child reacted to a standard set of toys and of how their child usually behaved with them. The basket of toys included books, a tool kit, a truck, a doll, two puzzles, and several other toys.

Requirements during these 25-minute sessions were as follows: (a) Parents and child remained in one room, (b) family members did not interact with the observer during the recording session, (c) no television was allowed, (d) no visitors or other family members were present, and (e) all phone calls were quickly terminated (Wahl, Johnson, Johansson, & Martin, 1974).

The first 20 minutes of each videotaped session were coded. Segments of the last 5 minutes were coded if portions of the first 20 minutes could not be used because of recording difficulties.

Measures

Assessment of Parental Language. The Parent Language Code (Harris, Note 1) was used to rate the functional aspects of parental language. While this code is similar to that used by Howlin et al. (1973), several of the categories in that code have been collapsed and the categories of label and adult-to-adult language have been added. Unscorable verbalizations were recorded only when no other language behavior occurred in that interval. When no language occurred in an interval, the category "other behavior" was scored. These categories are presented in Table I. Total number of sentences and average length of sentence were also scored for each parent during each session.

The tapes were rated on a continuous 10-second observe-and-record basis. Observers first scored the verbal behaviors on transcripts, on which 10-second intervals had been marked. They then viewed the videotape of the interaction to check their coding decisions for contextual cues. Unlimited replay of the videotapes was permitted, and observers attended to a single subject, mother or father, during each coding session.

Three paid female observers coded the interaction data. Two were graduate students in psychology and the other was a graduate student in

Table I. Parent Code

Language-oriented: Directed toward eliciting or responding to child's language or toward enhancing receptive language
Question: Parent asks child question. Includes "wh" words such as *where, when, what, how, who,* and subject-verb inversions. Use when parent is attempting to elicit information. When purpose is to give child direction, score as Nonlanguage (e.g., "Will you stop that?").
Answer: Parent replies to child's question. Must be preceded by verbal question from child.
Language direction: Parent gives child direction demanding language of child (e.g., "Tell me about the cup," "Read the book," "Say *cup*"). May be combined with language modeling and correction. Score both when appropriate. Includes prompts (e.g., "Is this a ha . . .?" "My name is Mom . . .").
Language modeling and correction: Parent repeats, expands, corrects, or in some fashion provides partial or complete model of child's language.
Direct reinforcement of language: Praise for child's language or language attempts. May be gross or subtle (e.g., "Uh huh," "Good," "Nice talking").
Label: Explicit identification of object by parent. Parent clearly attempts to teach child label.
Indirect modeling: Storytelling, reading, singing, counting in a rote fashion.
Non-language-oriented: Language that does not focus on child's verbal behavior
Nonlanguage: Parent speaks to child but does not attempt to elicit or in any other way focus on child's verbal behavior. Includes directions ("Play nicely now"), contracts ("If you stop crying, you can have the ball"), suggestions ("Why don't you play with the puzzle"), statements ("It's a nice day"), and approval and disapproval of nonverbal behaviors ("You are playing nicely").
Adult-to-adult: Parent speaks to spouse.
Unscorable: Statement that cannot be scored because of audio problems or statement is too soft to judge function.
Other behavior: Includes sitting quietly, sighs, talking on phone, laughter.

education. Two paid male undergraduate psychology majors scored the transcripts for average sentence length and total number of sentences. Coding of the data began after all observer pairs reached 80% or better overall effective percentage interobserver agreement and 80% or better overall effective percentage agreement with criterion protocols on four consecutive transcripts, which were not a part of the present study.

The roles of standard and reliability checker were randomly assigned for the first two-thirds of the data. At that point, one of the observers was able to work about half as frequently as the other two due to her schedule. Transcripts were still randomly assigned, with the constraint that this observer scored half as many transcripts as the other two. All coding was done independently. Observers were informed that reliability would be assessed for at least half of the data, and reliability was assessed covertly on 55% of the transcript. Transcripts for reliability assessment were randomly selected. Training continued throughout data collection.

Using scored intervals only, overall effective percentage agreement was measured by dividing the number of agreements in coding occur-

rences of behaviors, interval by interval, by the number of agreements plus disagreements (Bijou, Peterson, & Ault, 1968; Johnson & Bolstad, 1973; Romanczyck, Kent, Diament, & O'Leary, 1973). Individual category reliabilities were computed using Pearson product-moment correlations across session totals (Hartmann, 1977; Johnson & Bolstad, 1973).

RESULTS

Total Number of Sentences/Mean Sentence Length

Reliability on average sentence length was assessed on 18% of the transcripts. Reliability ranged from 93.5% to 98.5% and averaged 96.1%.

Data for total number of sentences and mean length of sentence for the parents of the autistic children were analyzed using a 2(condition of child) × 2(sex of parent) analysis of variance (ANOVA). The analysis of total number of sentences revealed significant effects for sex, $F(1, 18) = 5.50$, $p < .05$, and condition, $F(1, 18) = 5.65$, $p < .05$. Mothers spoke significantly more often than fathers ($M = 242.45$ vs. 182.65), and parents of the autistic children used significantly more sentences than the parents of the normal children ($M = 250.20$ vs. 174.90). Analysis of the mean length of sentence indicated no significant main effects or interaction.

Language Categories

Reliability. Overall effective percentage agreement figures ranged from 79% to 100% and averaged 89%. The Pearson product-moment correlations produced the following correlations category by category: question, .94; language modeling, .96; label, .88; indirect modeling, .97; reinforcement of language, .99; nonlanguage, .99; adult-to-adult language, .97; unscorable, .77; and other behavior, .99. Since there were no observer agreements in the scoring of answers and since answers occurred only twice throughout all the sessions, this category was eliminated from further consideration. Similarly, since indirect modeling occurred less than one time per session, this category was also eliminated.

Data Analyses. The language category data were analyzed in terms of both frequency and percentage of occurrence scores. Percentage of occurrence scores were computed in order to take into account differences in frequency of language. These scores were computed by dividing the total frequency of each category by the total number of scorable verbalizations recorded during each session. Data were analyzed using 2(condition of child) × 2(sex of parent) analyses of variance (ANOVA).

Table II. Parental Language by Category

Language category	Frequency		Percentage of occurrence	
	Parents of autistics	Normals	Parents of autistics	Normals
Question	4.45[a]	1.85[a]	3.11	2.25
Language direction	7.40	4.45	5.06	4.56
Language modeling	4.95	5.05	3.24	5.67
Label	10.20[a]	5.65[a]	8.43	5.60
Reinforcement of language	1.85	1.60	1.13	1.64
Non-language-oriented language	79.3[b]	61.0[b]	68.16	67.21
Adult-to-adult language	12.15	12.10	10.49	12.77
Unscorable	1.10	.95	–	–
Other behavior	27.75[b]	46.65[b]	–	–

[a] $p < .10$.
[b] $p < .05$.

Frequency Data. Comparison of differences across the two groups (see Table II) revealed that the parents of the autistic children used more non-language-oriented language than did the parents of the normal children, $F(1, 18) = 6.51$, $p < .05$, and that the parents of the normal children engaged in more behavior other than talking than did the parents of the autistic children, $F(1, 18) = 5.80$, $p < .05$. Trends toward significance occurred for information-seeking questions, $F(1, 18) = 2.99$, $p < .10$, and labels, $F(1, 18) = 3.13$, $p < .10$, with the parents of the autistic children using more questions and labels than the parents of the normal children.

Across nearly all language categories, mothers were more active than fathers (see Table III). More specifically, mothers employed more requests

Table III. Mothers' and Fathers' Language by Category

Language category	Frequency		Percentage of occurrence	
	Mothers	Fathers	Mothers	Fathers
Question	4.45[c]	1.85[c]	3.09	2.27
Language direction	8.40[c]	3.45[c]	5.99[b]	3.63[b]
Language modeling	6.55[a]	3.45[a]	5.35	3.56
Label	9.95[b]	5.90[b]	8.21[a]	5.81[a]
Reinforcement of language	2.45	1.00	1.79	.97
Non-language-oriented language	77.90[b]	62.40[b]	64.49[a]	70.89[a]
Adult-to-adult language	12.80	11.45	10.65	12.61
Unscorable	1.00	1.05	–	–
Other behavior	27.85[c]	46.55[c]	–	–

[a] $p < .10$.
[b] $p < .05$.
[c] $p < .01$.

for language, $F(1, 18) = 9.36, p < .01$, asked more questions, $F(1, 18) = 8.37, p < .01$, and labeled objects more often, $F(1, 18) = 5.03, p < .05$, than did fathers. In addition, mothers tended to correct or expand their children's language more often than fathers, $F(1, 18) = 3.61, p < .10$. Mothers also used more non-language-oriented language than fathers, $F(1, 18) = 5.79, p < .05$. Consistent with the above findings, fathers engaged in more "other behavior" than mothers, $F(1, 18) = 9.76, p < .01$.

Percentage of Occurrence. Examination of differences revealed no significant differences between percentage of occurrence scores for parents of autistic children and parents of normal children. Several differences occurred between mothers' and fathers' language patterns. Mothers' percentage of direct requests for language was greater than fathers', $F(1, 18) = 5.53, p < .05$. Also, mothers tended to use a greater proportion of labels than fathers, $F(1, 18) = 3.06, p < .10$. While mothers engaged in higher proportions of language-oriented language, their percentage of non-language-oriented language tended to be less than that of their spouses, $F(1, 18) = 3.62, p < .10$.

DISCUSSION

The present study demonstrated few differences between the language patterns of parents of preschool-aged autistic and normal children who were matched for language age. The parents of the autistic children used more non-language-oriented language (directions, suggestions, comments about the child's nonverbal behavior) and tended to use more questions and labels than did the parents of the normal children. However, when differences in frequency of language were taken into account through percentage scores, these differences no longer occurred. Contrary to the hypotheses of Howlin et al. (1973), these two groups of parents provided similar amounts and percentages of reinforcement for vocalization, correction of language, and encouragement to speak. While the parents of the autistic children spoke more frequently during the sessions, the complexity of the language they addressed to their children, as measured by mean length of utterance, was similar to that of the parents of the normal children. These results suggest that the parents of autistic and young normal children provide similar language environments for their children and that the language environment of the preschool-aged autistic child is normal for her/his stage of language development.

The present results are inconsistent with those of several investigations that demonstrated that the mothers of children labeled as childhood schizophrenics were poorer language models for their children than the

mothers of normal children (Goldfarb et al., 1966, 1972, 1973; Meyers & Goldfarb, 1961). Differences between the present study and those of Goldfarb and his colleagues may be due to a number of factors, including differences in diagnosis of the children, assessment conditions, coding systems, living conditions of the children, and/or comparison groups. The absence of operational diagnostic criteria in the studies by Goldfarb et al. and the frequent tendency to use the terms *childhood schizophrenia, childhood psychosis,* and *autism* interchangeably (Laufer & Gair, 1969) make it difficult to determine whether the children in the present study are diagnostically distinct from or similar to those studied by Goldfarb and his colleagues.

The current results are consistent with those of studies examining the language environments of autistic children with some spontaneous language (e.g., Cantwell et al., 1977; Frank et al., 1976; Wolchik & Harris, 1982). These studies have demonstrated that autistic children experience kinds and amounts of language stimulation similar to those of normal children of the same chronological age (Frank et al., 1976) and of children with similar language abilities (Cantwell et al., 1977; Wolchik & Harris, 1982). The present study suggests that, like older, more verbal autistic children, preschool-aged autistic children with very limited verbal abilities experience language environments comparable to those of normal children at a similar level of language development.

With the present data considered, at least three different groups of researchers have found no support for the notion that mothers of autistic children are deficient language models for their children. Thus, the implication that deviant parent-child language interactions play an etiological role in the language disabilities of autistic children (Goldfarb et al., 1966, 1972; Howlin et al., 1973; Meyers & Goldfarb, 1961) must be questioned. Instead of providing deficient language environments, mothers of autistic children appear to provide language environments similar to those of other language-disabled children and, more importantly, to those of normal, language-learning youngsters.

Although it appears that the parents of autistic children provide language environments similar to those experienced by normal children in the beginning stages of language development, the language skills of these children develop slowly, if at all. Parents may need to provide special language environments if autistic children are to acquire language. Recently, Harris et al. (1981) examined the effects of a parent training program that focused on helping parents to teach prelanguage and language skills, to become more responsive to their children's language, and to encourage language use. Although the children of these parents made significant gains in prelanguage and language skills, it is impossible to identify the

contribution of changes in parental language patterns since the training package consisted of many aspects. Given that parent training results in more durable improvement in austistic children than does clinic treatment (Koegel, Schreibman, Britten, Burke, & O'Neill, 1981), future research that identifies the most effective means of helping parents to facilitate their children's language growth would be extremely valuable.

Mothers' versus Fathers' Language Patterns. The inclusion of fathers in the present study adds an important dimension to the literature on the language environments of autistic children. With the exception of the study by Wolchik and Harris (1982), researchers have focused on the language of mothers of these children. The present study suggests that fathers of autistic children provide language environments similar to those provided by fathers of normal, language-learning children. However, several differences emerged between mothers and fathers in the language they addressed to their children.

Mothers talked more than fathers and took a more active role in teaching their children, using more language directions, labels, and information-seeking questions than their husbands. The mothers also gave their children more directions about nonverbal behaviors than did their husbands. After differences in amount of language were taken into account through percentage scores, mothers remained significantly more active in requests for language and tended to use a greater proportion of labels than fathers. However, fathers tended to use a greater proportion of non-language than mothers. It appears that fathers and mothers play different roles in their child's language environment. While mothers were more didactic in their interactions with their child, fathers attended more to the child's nonverbal rather than verbal activities. These interaction patterns may be the product of different socialization experiences of men and women. Alternatively, these results may be specific to the assessment situation. Fathers may have taken a less active role than usual in order to let the primary caregiver, the mother, interact with the child so that the child would do as well as possible.

These results are similar to those of Golinkoff and Ames (1979), who reported that fathers spoke less than mothers in a triadic free-play situation, and Vandell (1979a, 1979b), who reported that mothers used more didactic utterances than fathers. Contrary to the present results, Golinkoff and Ames (1979) reported no differences in the relative proportions of various syntactic aspects of parental language, and Masur and Gleason (1980) reported that more fathers than mothers requested labels and functions of objects. Clearly, it is too early to draw definitive conclusions regarding similarities and differences in mothers' and fathers' roles in their child's language environments.

The present results suggest that young autistic and normal, language-learning children are exposed to similar language environments and that the parents of the autistic children encourage and respond to their children's language attempts as frequently as do the parents of young children without language handicaps. Also, the present results suggest that mothers and fathers of both autistic and normal children play different roles in their child's language environment.

REFERENCE NOTE

1. Harris, S. L. *A code for assessing the functional aspects of parental speech.* Unpublished manuscript, Rutgers University, 1975.

REFERENCES

Alpern, G., & Bolls, T. *Developmental profile.* Aspen, Colorado: Psychological Development Publications, 1972.

Bijou, S. W., Peterson, R. F., & Ault, M. H. A method to integrate descriptive and experimental field studies at the level of data and empirical concepts. *Journal of Applied Behavior Analysis,* 1968, *1,* 175-191.

Brown, R. *A first language: The early stages.* Cambridge: Harvard University Press, 1973.

Cantwell, D. P., Baker, L., & Rutter, M. Families of autistic and dysphasic children. II. Mother's speech to the children. *Journal of Autism and Childhood Schizophrenia,* 1977, *7,* 313-327.

Cantwell, D. P., Baker, L., & Rutter, M. Family factors. In M. Rutter & E. Schopler (Eds.), *Autism: A reappraisal of concepts and treatment.* New York: Plenum Press, 1978.

Davis, S., & Marcus, L. M. Involving parents in the treatment of severely communication-disordered children. *Journal of Pediatric Psychology,* 1980, *5,* 189-198.

Frank, S. M., Allen, D. A., Stein, L., & Meyers, B. Linguistic performance in vulnerable and autistic children and their mothers. *American Journal of Psychiatry,* 1976, *133,* 909-915.

Friedlander, B. Z., Jacobs, A. C., Davis, B. B., & Wetstone, H. S. Time-sampling analysis of infants' natural language environments in the home. *Child Development,* 1972, *43,* 730-740.

Goldfarb, W., Goldfarb, N., & Scholl, H. H. The speech of mothers of schizophrenic children. *American Journal of Psychiatry,* 1966, *122,* 1220-1227.

Goldfarb, W., Levy, D. M., & Meyers, D. I. The mother speaks to her schizophrenic child: Language in childhood schizophrenia. *Psychiatry,* 1972, *35,* 217-226.

Goldfarb, W., Yudkovitch, E., & Goldfarb, N. Verbal symbols to designate objects: An experimental study of communication in mothers of schizophrenic children. *Journal of Autism and Childhood Schizophrenia,* 1973, *3,* 281-298.

Goldstein, S. B., & Lanyon, R. I. Parent-clinicians in the language training of an autistic child. *Journal of Speech and Hearing Disorders,* 1971, *36,* 552-560.

Golinkoff, R. M., & Ames, G. J. A comparison of fathers' and mothers' speech with their children. *Child Development,* 1979, *50,* 28-32.

Harris, S. L., Wolchik, S. A., & Weitz, S. The acquisition of language skills by autistic children: Can parents do the job? *Journal of Autism and Developmental Disorders,* 1981, *11,* 373-384.

Hartmann, D. P. Considerations in the choice of interobserver reliability estimates. *Journal of Applied Behavior Analysis,* 1977, *10,* 103-116.

Hemsley, R., Howlin, P., Berger, M., Hersov, L., Holbrook, D., Rutter, M., & Yule, W. Treating autistic children in a family context. In M. Rutter & E. Schopler (Eds.), *Autism: A reappraisal of concepts and treatment.* New York: Plenum Press, 1978.

Howlin, P., Cantwell, D., Marchant, R., Berger, M., & Rutter, M. Analyzing mothers' speech to young autistic children: A methodological study. *Journal of Abnormal Child Psychology,* 1973, *1,* 317-339.

Johnson, S. M., & Bolstad, O. D. Methodological issues in naturalistic observation: Some problems and solutions for field research. In L. A. Hammerlynck, L. C. Handy, & E. J. Mash (Eds.), *Behavior change: Methodology, concepts and practice.* Champaign, Illinois: Research Press, 1973.

Koegel, R. L., Schreibman, L., Britten, K. R., Burke, J. C., & O'Neill, R. E. A comparison of parent training to direct child treatment. In R. L. Koegel, A. Rincover, & A. L. Egel (Eds.), *Educating and understanding autistic children.* Houston: College Press, 1981.

Kozloff, M. *Reaching the autistic child.* Champaign, Illinois: Research Press, 1973.

Laufer, M. W., & Gair, D. S. Childhood schizophrenia. In L. Bellak & L. Loeb (Eds.), *The schizophrenic syndrome.* New York: Grune and Stratton, 1969.

Lederberg, A. The language environment of children with language delays. *Journal of Pediatric Psychology,* 1980, *5,* 141-160.

Lovaas, O. I. Parents as therapists. In M. Rutter & E. Schopler (Eds.), *Autism: A reappraisal of concepts and treatment.* New York: Plenum Press, 1978.

Masur, E. F., & Gleason, J. B. Parent-child interaction and the acquisition of lexical information during play. *Developmental Psychology,* 1980, *16,* 410-416.

Meyers, D. I., & Goldfarb, W. Studies of perplexity in mothers of schizophrenic children. *American Journal of Orthopsychiatry,* 1961, *31,* 551-564.

National Society for Autistic Children. National Society for Autistic Children definition of the syndrome of autism. *Journal of Autism and Childhood Schizophrenia,* 1978, *8,* 162-167.

Nelson, K. Structure and strategy in learning to talk. *Monographs of the Society for Research in Child Development,* 1973, *38*(1-2, Serial No. 149).

Philips, J. R. Syntax and vocabulary of mothers' speech to young children: Age and sex comparisons. *Child Development,* 1973, *44,* 182-185.

Romanczyck, R. G., Kent, R. N., Diament, C., & O'Leary, K. D. Measuring the reliability of observational data: A reactive process. *Journal of Applied Behavior Analysis,* 1973, *6,* 175-184.

Rutter, M. Behavioral and cognitive characteristics of a series of psychotic children. In J. Wing (Ed.), *Early childhood autism: Clinical educational and social aspects.* London: Pergamon Press, 1966.

Seitz, S., & Stewart, C. Imitations and expansions: Some developmental aspects of mother-child communications. *Developmental Psychology,* 1975, *11,* 763-768.

Snow, C. E. Mothers' speech to children learning language. *Child Development,* 1972, *43,* 549-565.

Vandell, D. A microanalysis of toddlers' social interaction with mothers and fathers. *Journal of Genetic Psychology,* 1979, *134,* 299-312. (a)

Vandell, D. Effects of a playgroup experience on mother-son and father-son interaction. *Developmental Psychology,* 1979, *15,* 379-385. (b)

Wahl, G., Johnson, S. M., Johansson, S., & Martin, S. An operant analysis of child-family interaction. *Behavior Therapy,* 1974, *5,* 64-78.

Wolchik, S. A., & Harris, S. L. Language environments of autistic and normal children matched for language age: A preliminary investigation. *Journal of Autism and Developmental Disorders,* 1982, *12,* 43-55.