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THE INTERACTIVE POINT OF VIEW IN LANGUAGE DEVELOPMENT, DISORDERS, AND INTERVENTION

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The paper presents the interactive perspective in developmental psycholinguistics. From this perspective, recent data pertaining to language disorders, particularly mental retardation, childhood autism, deafness, and speech and language impairment, are presented and discussed. The implications of these data for language intervention within the family and with the help of the family are indicated. The emphasis is on the systemic dimension of the parent-child relationship within the family context and the reciprocal adaptations that supply the dynamic basis of the system. The developmental value of these adjustments is strongly suggested and their therapeutic usefulness is indicated.

Following people like Richard Bell (1968, Bell and Harper, 1977), Albert Bandura (1965, 1977), and others, psychologists have begun in recent years to conceptualize behavior and the determinants of behavior in *multidirectional and reciprocal ways*. Bandura (1977), for example, holds the view that behavior (B), the other personal factors (P), and the environmental factors (E) affecting the behavior, operate as *interlocking determinants of each other* as illustrated by the formula :



where *B* stands for behavior, *P* for the other personal factors affecting behavior, and *E* for the environmental factors. Any behavior is simultaneously determined by and partially determines the other personal factors and the environmental factors that impinge upon it. In acting, people modify themselves and the environment. Their behaviors in turn are modified by the changes they have contributed to bring about in themselves and in the world around them. This view contrasts theoretically with the usual unidirectional formula like $B = f(P, E)$ where *f* stands for "is a function of".

Many psychologists of language and developmental psycholinguists have also turned to the new paradigm. In this respect, the contrast is striking between the actual research and the types of research on the theoretical paradigms of the sixties. Most researchers in the sixties

studied the formal aspects of early language development in an entirely unidirectional way, i.e., solely considering the language of the child without paying any attention to the speech heard by and addressed to the child by the parents and other adults. In some cases, this linguistic input was flatly discarded without a shred of empirical evidence as totally improper for language acquisition (Chomsky, 1965; Fodor, 1966; Lenneberg, 1967; and others)¹.

These negative expectations regarding the possible usefulness of the linguistic environment for language acquisition have been replaced in the early seventies by a growing appreciation of the remarkable reciprocal adjustments taking place in most episodes of verbal interaction between child and parents or related adults (Mahoney and Seely, 1976; Moerk, 1977; Rondal, 1978a; for reviews of the literature).

Parents, in various cultures and social classes, especially mothers but also fathers (see Berko-Gleason, 1975, and Rondal, 1978b) simplify their speech in every respect (phonological, morphological, syntactical, semantical, etc.) when addressing their language learning children. They implicitly and explicitly correct and recast their children's utterances and they approve or disapprove of the forms and contents of these utterances. Moreover, parents finely adjust their speech as to the length and the structural and content complexity, to the developing receptive and productive linguistic capabilities of the children therefore supplying them continuously with speech that is slightly more advanced than their own. Contrary to previous – and premature – statements, parental speech to children appears to be an excellent teaching-language (Moerk, 1977; Rondal, 1978a).

Many questions remain unanswered particularly as to the middle-range and the long-range effects of parental adjustments on children's language development and as to the precise modalities through which such effects are achieved. The range of issues includes for example questions on what constitutes an ideal model language for a given child and what part of parental speech, in terms of structures and frequencies, triggers new developments or the reorganization of previously acquired knowledge in the child.

In spite of these limitations, an important body of data now exists on the environmental aspects of language acquisition (see Moerk, 1977, for example).

¹ "It seems clear that many children acquire first or second languages quite successfully even though no special care is taken to teach them and no special attention is given to their progress. It also seems apparent that much of the actual speech observed consists of fragments and deviant expressions of a variety of sorts. Thus it seems that a child must have the ability to "invent" a generative grammar that defines well-formedness and assigns interpretations to sentences even though the primary linguistic data that he uses as a basis for this act of theory construction may, from the point of view of the theory he constructs, be deficient in various respects" (Chomsky, *Aspects of the theory of syntax*, 1965, p. 200-201).

"He (Fodor) felt the best working assumption to be that the language environment of a child did not differ in any useful way from that of an adult" (General discussion following Fodor's presentation, Smith and Miller, *The genesis of language*, 1966, p. 126).

The applied field of language disorders and intervention has been slower in converting to the interactive point of view and in certain cases has not converted yet. The rest of the paper reviews recent research data pertaining to language development and intervention in mentally retarded, young autistic, young deaf, and normal children with speech and language problems. An attempt is made to state the importance of the interactive perspective for language disorders and intervention, to evaluate available work, and to suggest new or complementary areas of research.

MENTAL RETARDATION

The first condition for an interactive analysis, is to collect speech data from a person or a group of persons and their interlocutors in an ecologically valid setting (Bronfenbrenner, 1978, for a definition of this last concept). This elementary condition is not met in several recent investigation regarding the effects of institutionalization in moderately and severely retarded children. For example, in a recent study, McNutt and Leri (1979) have compared institutionalized and non-institutionalized retarded children on usage of grammatical categories, length and structural complexity of utterances, and for subskills on the Illinois Test of Psycholinguistic Abilities. Differences were found between the two groups which the authors take to mean that the grammatical structure of language is less affected by the environment than are semantic and auditory elements. Accordingly, they suggest that remedial language programs for institutionalized retarded children should emphasize semantic performance. However, no data at all were gathered on the actual linguistic environment of the institutionalized and non-institutionalized retarded children. Therefore, the causal link established by the authors between environment and language development is purely hypothetical. A much stronger case would have been built, when the researchers would have collected data on the actual speech exchanged by the retarded children and their usual adult interlocutors in the institutional and home settings. Additionally, such data would constitute a much more interesting basis for organizing an interactive intervention program in the institutional context involving the caretakers and the professional people in the institution rather than giving a simple description of the speech of the children.

The systematic study of the linguistic environment of the mentally retarded children can be traced back to the studies by Gerald Siegel and associates, at the University of Minnesota, in the sixties (Siegel, 1963a, b, 1967; Siegel and Harkins, 1967). However, Siegel's studies do not qualify as interactive since only the speech of normal adults assembled with the retarded children was studied and no data were gathered on the speech of the children themselves. Siegel and associates observed various simplifications in the speech of adults speaking to

retarded children. They suggested that this kind of modifications might serve to maintain rather than to enhance the children's poor communication skills.

The first genuine interactive study of the linguistic environment of the mentally retarded children was conducted in the early seventies by Marshall and collaborators (Marshall, Hegrenes, and Goldstein, 1973), at the University of Washington. They compared the speech to normal and retarded children by their own mothers in a free-play situation in a laboratory setting and they also collected and analysed data on the speech of the children to their mothers. The normal and the retarded children were matched for chronological age (CA). They were aged CA 3 to 5 years. The authors chose to analyse their data in terms of Skinner's verbal operant categories – Skinner, 1957 – (i.e., mands, tacts, intraverbals, and echoics, leaving outside the autoclitics category, however). They reported more mands and more echoics and fewer tacts and intraverbals in the speech of the retarded children and in the speech of the mothers addressing their retarded children which may indicate a lower level of language functioning. At about the same time, a study of the early maternal linguistic environment of two-year old normal and Down's syndrome children was conducted by Rynders and associates at the University of Minnesota (Buim, Rynders, and Turnure, 1974) also in a free-play situation and in a laboratory setting. This time however no information was reported on the speech of the children. Rynders and associates observed differences in the speech of the mothers depending whether they had normal or Down's syndrome children. For example, the mothers addressing their normal children used longer utterances and more advanced types of sentences and linguistic structures. On this basis, Rynders and associates concluded that the linguistic environment of language-learning Down's syndrome children is "different" from that of normal children. This interpretation was further largely echoed in the specialized literature, generalized to other mentally retarded children, and taken to mean that the language addressed to these children is truly deficient, improper for steady language acquisition, and therefore that it should be changed (for example, Seitz, 1975; Mitchell, 1976). Dolley (1974) even went so far as to identify adult speech to retarded children with restricted linguistic codes in the sense of Bernstein (1964).

Actually, the conclusion of Rynders and others is unwarranted because they failed to take in consideration the possible effects of the children's level of linguistic development on the speech of the adults (Rondal, 1966, 1977, 1978c).

It will be recalled that in the above-mentioned investigations, the normal and the retarded children were matched for chronological age. However, it is known that retarded children, particularly moderately and severely retarded children, are markedly delayed in every aspect of language development (Rondal, 1975, for a review of this literature). Therefore, at corresponding CA's, retarded children will not, by far, talk in the same way as normally developing children.

For example, most non-institutionalized Down's syndrome children do not start talking at all before 2 years CA and do not start combining two words in utterances before three or four years CA (e.g., Share, 1975). The same thing is true of moderately and severely mentally retarded children other than Down's syndrome children (Karlin and Strazzula, 1952). At similar ages, normal children produce sentences sometimes as long as twelve words and they are well engaged in the discovery of the structure of their maternal language.

When assembling children with so much difference in communicative ability, it is hardly surprising – if one adopts a bi-directional or interactive point of view – that maternal speech to the normal and to the retarded children was found to differ markedly. These differences may be comparable to those one would observe if one compared maternal speech addressed to, say a normal five-year old child and to another normal child aged two years. The above differences therefore cannot be simply taken as evidence that maternal speech to retarded children is deficient.

In order to prove that adult speech to retarded children is deficient, one has to show that there are deficits when the normal and the retarded children are at *comparable* levels of language development. The question on differences can be answered in studies where mothers are assembled with normal and retarded children matched for level of linguistic development. In a large-scale study (Rondal, 1976, 1978c). 21 normal and 21 Down's syndrome children were tape recorded at home in a play situation while conversing with their mothers. The children were matched at three levels of Mean Length of Utterance using Brown's criteria (Brown, 1973)². Other language production measures were computed on the children in order to check the validity of the MLU matching performed as a basis for the study: Type-token ratio (an index of lexical diversity), upper bound or longest utterance in the corpus, proportion of utterances without verb, and number of modifiers per utterance. A semantic structure analysis adapted from Chafe was made (Chafe, 1970). These analyses yielded no significant differences but one between the two groups of children at each MLU level. The only difference was with Type-token ratio and favored Down's syndrome children over normals. Of course there were differences across MLU levels for the normal as well as for the Down's syndrome children. The normal and the Down's syndrome children therefore were at comparable linguistic levels. Of course they differed

² Rondal (1976, 1978) matched normal and Down's syndrome children for Mean Length of Utterance (MLU). He used the following 3 x 2 design:

Language level (MLU in morphemes)	Children	
	Down's syndrome	Normal
	(Mean CA in months)	
1. MLU 1.00-1.50	49	23
2. MLU 1.75-2.25	78	27
3. MLU 2.50-3.00	117	30

widely in chronological ages. For instance, at MLU level 1, the average CA was about 4 years for the Down's syndrome children versus 23 months for the normal children. At MLU level 3, the corresponding figures were about 10 years for the Down's syndrome children versus 30 months for the normal children.

The speech of the mothers was thoroughly analyzed in its numerical, lexical, syntactical, semantical, pragmatical output, and language-teaching aspects (see Rondal, 1976, 1978c, for more details). No significant difference was found in maternal speech to the Down's syndrome and the normal children at each MLU level. As expected, there were numerous significant differences in maternal speech across MLU levels for the normal as well as for the Down's syndrome children.

It appears therefore that mothers of Down's syndrome children do indeed make appropriate linguistic adjustments when retarded and nonretarded children are matched in terms of productive linguistic level.

Buckhalt and collaborators, at Southern California, (Buckhalt, Rutherford, and Goldberg, 1978) and Guralnick and Brown (1977), at Ohio State, recently provided data that confirm these findings and they extend it tentatively to retarded children others than Down's syndrome children and to nonverbal aspects of the adult-child interaction. Buckhalt et al. matched 10 normal and 10 Down's syndrome infants aged 9 to 18 months (CA match) and assembled them individually with their mothers in a laboratory play-room. They did not find much differences between maternal verbal and nonverbal behaviors addressed to the children which may have to do with the young age of the infants at least for the verbal behaviors. By comparing their data on maternal speech with those of Buium et al. (1974) – collected with 24 months old normal and Down's syndrome children – Buckhalt et al. showed that the maternal MLU had slightly progressed for the normal children between 12 and 24 months but not for the Down's syndrome children³. It is likely, however, that the Down's syndrome children do not progress much in MLU between CA 12 and 24 months. Those data indicate consistency with the literature on motherese, i.e. that mothers' language increases in complexity only as the child begins to exhibit greater language competence (e.g., Broen, 1972).

Guralnick and Brown (1977) analyzed the speech of normal children aged 4 to 6 years in an instructional and free-play setting (within an integrated preschool) speaking to retarded children of varying mental handicap (mildly, moderately, and severely retarded). They computed a variety of parameters reflecting verbal productivity and grammatical complexity of speech. The speech of the normal children tended to be more complex, more frequent, and more diverse when speaking

³ Buckhalt et al. found that from their study to the Buium et al. study, maternal MLU increased from 3.16 to 4.20 in the normal children group but stayed about the same in the Down's syndrome group (3.50).

to developmentally more advanced children. This study and its result is the exact counterpart for retarded interlocutors of the study by Shatz and Gelman (1973) with normal 4-year olds "talking down", so to speak, when addressing 2-year olds. Guralnick and Brown are currently further analyzing the appropriateness and fine tuning of the speech adjustments of nonretarded children to the developmental level of the listener (Guralnick, 1978).

Rather than the type of handicap or the physical appearance, it seems that the productive linguistic level of the child is one of the key variables controlling the complexity level of the speech of the adult. However, Cross (1977) has suggested that the child's receptive level of language development is also one potent variable in triggering parental adjustments. This variable should be studied in connection with the expressive level in the interactions between the retarded children and their parents and other adults or children.

Additional investigation conducted in the last two years point out the conclusions regarding maternal speech to the Down's syndrome children and the speech of these children. First, a comparison of the speech of 14 Down's syndrome and 14 normal children matched for MLU (MLU 1,75 to 3,00), in conversation with their mothers at home – using the Lee's Developmental Sentence Scoring Procedure (Lee, 1974) by Rondal (1978d) – indicated that even when they are matched for MLU, there still remain deep-seated syntactic differences between normal and retarded children. Down's syndrome children as a whole tend to produce sentences that are syntactically less sophisticated. Operations of reversing the order of the first nominal and verbal elements in asking questions (e.g., "Is he coming?") and sequentially combining main and secondary verbs in sentences (e.g., present or past participle "I see a boy running", "I found a toy broken", non-complementary infinitives "I'm afraid to look", etc.) are less advanced in Down's syndrome children even when these children are producing sentences of comparable length to those of normal children.

These data bear directly on the so-called delay-deficit issue in language development of mentally retarded children, i.e., the question whether language development in the retarded is a delayed but basically similar version of normal development or whether it follows a qualitatively different path. Rondal (1978e, g) has reviewed and discussed the issue in detail. The issue is complex with difficult methodological problems and it does not allow any simple answers. Summarizing this review, it can be said that at a relatively superficial level, and particularly for the phonological, lexical, and semantic-structural aspects of language, it is possible to compare the retarded to younger normal children. However, when finer-grained analyses are made, particularly as to the morpho-syntactical aspect of language, the same comparison is far less satisfactory. The study reported above (Rondal, 1978c) exemplifies other data than can be interpreted along the same line in the delay-difference question.

Also in a recent additional analysis of Rondal's data (Rondal, 1976,

1978c) on maternal speech to normal and Down's syndrome children. Gutmann and Rondal (1979) have applied Skinner's full 1957 scheme for analyzing verbal behavior (including the autoclitic dimension) to selected portions of the original data. The analyses indicate that as MLU increases the frequency in number of total verbal responses in each Skinnerian category increases for both groups of children and mothers. Differences between groups were noted, however, in the proportion of *intraverbal* and *echoic* response classes. Normal children produced more echoics (i.e., more imitative verbal responses) and fewer intraverbals (i.e., verbal associative responses) than Down's syndrome children at each MLU level. The question of the imitative capability in Down's syndrome children in relation to the expressive linguistic level of the children is currently under investigation as several conflicting hypotheses may account for the data obtained in this and other studies. Rondal's data (1976, 1978c) also indicate a tendency in nonretarded children to imitate more than MLU matched Down's syndrome children. According to Courtright and Courtright (1976), Rees (1975), and Ryan (1973), imitating may occur when children are unfamiliar with the syntactic or semantic aspects of the verbal utterance they hear and do not know how to respond. The fact that Down's syndrome children, matched on MLU to nonretarded children, imitate less may indicate that 1. they understand what was said, 2. they are less likely to imitate when they hear vocal utterances that contain semantic and syntactic properties they do not understand or produce, or 3. retarded children may just imitate less frequently. If the latter two cases are true, the retarded children may not be making use of a valuable language-learning strategy. Interestingly, the mothers of Down's syndrome children were also found to use more intraverbals than the mothers of nonretarded children. The Gutmann and Rondal data are at variance with those of Marshall and collaborators (Marshall et al., 1973) who also used Skinner's scheme for the analysis of verbal behaviors. This is not surprising as Marshall et al. matched their children for chronological age versus MLU in the Rondal studies.

The new data do not call for a change in the interpretation given above regarding the appropriateness of mothers' speech adjustments when addressing their Down's syndrome children. They bring about additional questions that are currently under investigation and will lead to a better understanding of the mechanisms involved.

The studies reviewed clearly indicate that mothers' speech to mentally retarded children is formally and functionally appropriate for language growth in these children. They mean that the ground is sound and solid if one wants to use and rely on the families in language intervention with the retarded children. There is no apparent need to drastically change the linguistic environment of the retarded as some have hastily suggested.

However, this does not mean that parental speech to retarded language-learning children cannot be improved in terms of maximizing

the efficiency of the parents in teaching language to their children through verbal interaction, which will contribute to speeding up the language development process in the retarded children as much as possible. This is a different issue from the one regarding the deficit question in parental speech to the retarded children and it can be raised for the parents of normal children as well (e.g., Metzl, 1978).

Intervention programs for the retarded children emphasizing parental involvement and direct intervention in the program have been implemented in several places in the United States (MacDonald, Blott, Gordon, Spiegel, and Hartman, 1974; MacDonald, 1975; Seitz and Hoekenga, 1974; Rynders and Horrobin, 1975, and others). The programs vary in several respects in the way they associate the parents and teach them how to be effective teachers themselves (Rondal, 1978f).

The objective has been to teach mothers of young retarded, through instructions and modeling, how to increase the efficiency of their verbal interaction with the children for the purpose of language development in the children. Seitz and Hoekenga (1974) asked the mothers of several retarded children to observe the therapist interacting with the children in a play-situation. Then, the mothers substituted for the therapist for the last part of the program. Rynders and Horrobin (1975) provided the mothers of Down's syndrome infants with sets of simple play material and sets of words to be used during the sensory-motor activities. MacDonald et al. (1974) aimed at improving the language of Down's syndrome children between 3 and 5 years CA, producing only single-word utterances, by asking their mothers, first to watch and assist the therapist in training generalization of language changes in the children from imitation to conversation, and then to conduct the same task on their own, at home, for the last part of the program. The results were very encouraging. They certainly indicate that parental speech can still be improved in certain aspects of language teaching and that these modifications are effective in terms of the children's language development.

Recently, it was suggested that a communicative and linguistic intervention can and should be started very early with severely retarded children (Rondal, 1978f). By very early, it was meant from *the first months of life on*. We start to know much more about the early communicative problems of Down's syndrome infants, for example (e.g., Jones, 1977; Smith, 1977; Dale, 1977). At the same time, the literature on cognitive and communicative developments in the normal infant is flourishing (e.g., Bruner, 1975a, 1975b; Rondal, 1979). This supplies the basic knowledge for instigating very early intervention. The techniques are also available. They consist primarily in having the parents and the caretakers learning how to interact efficiently with the infants and children and how to use the principles of the operant shaping and "social" conditioning techniques. Some sort of long term parental monitoring and counseling may then be organized. Com-

municative and linguistic intervention with retarded infants and children should be based on the following principles : 1. Start early and continue in some way throughout the years, 2. Be interactive in nature and involve the infant's or the child's family, 3. Be developmental in nature, i.e., make use of the data on normal language development (Rondal, 1978f). Such an early intervention should contain programs designed to 1. Enhance communication and proto-conversation, and joint attention and joint action leading to lexical reference in the infant, 2. Facilitate object concept development, and promote representational mental activity and symbolic play before teaching receptive and expressive vocabulary, and 3. Facilitate combinatorial speech (see Rondal, 1978e for more details). The general interventional strategy goes as follows : systematically compare prelinguistic and early linguistic development of normal and retarded infants. In so doing, detect when, for which speech and communication component, and in which respect the development of retarded individuals begins to differ from the one of normals. Then attack on the ongoing deficits exhibited by the retarded right from the time of their appearance or better try to prevent them from appearing.

Most of what was said above regarding the necessity of adopting an interactive point of view and collecting, analyzing, interpreting, and using data along this line of thinking applies equally well to other groups of language delayed, language deficient, and language disturbed children. Unfortunately, there is a paucity of relevant data in some of these areas that makes any generalization very difficult or impossible.

EARLY AUTISM

Much has been said, written, and sometimes substantiated, on the affective, cognitive, and communicative capabilities of parents with young autistic children. Parents of autistic children are often of superior intelligence, education, and occupation (Kugelmans, 1970), but not always (Florsheim and Peterfreund, 1974). Their "style of thinking" evaluated through various tests of so-called "thought disorders" and projective techniques are often said to reveal pathological or quasi-pathological traits like sadness, disturbed moods and impulses, hostile affects, narcissism in mothers, obsessive introversion, etc. (Thaler, Singer and Wynne, 1963; Kugelmans, 1970). This is not always the case, however. Other studies have reported no differences between groups of parents of young autistic children and parents of normal children (e.g., Lennox, Callias, and Rutter, 1977). Some of the methodological problems involved in these empirical differences have been discussed by Netley and Lockyer (1978). They include unrepresentative samples, parental intellectual level and social class, and external and internal validity of the test used to evaluate thought disorder.

The negative characterizations of the affective and cognitive personality aspects of the parents of autistic children is related to (predicted by) the psychodynamic hypothesis that sees primary disruption and impairment in the child's relationship to parental figures as determining early autistic disorders (Kugelmans, 1970). Goldfarb (1961), for example, has attributed autism to actual or relative maternal sensory and affective deprivation in the early months and years of life. In reality, the psychodynamic hypothesis has only a status of co-determinant of early autism because neurophysiological and biochemical hypotheses have been developed and substantiated in recent years (Kugelmans, 1970).

The speech of mothers of autistic children has been investigated by several investigators including Goldfarb and his collaborators. Goldfarb has been repeating for years that one major factor affecting the so-called aberrant speech of autistic children, when they exhibit speech at all, is the negative influence of poor speech and communicative capacity in the mothers. This assertion is consistent with his psychogenic theory of early autism. In several cases, Goldfarb and associates have reported data on the speech of the mothers of autistic children that seem to conform to the description made (e.g., Goldfarb, Goldfarb, and Scholl, 1966). It was rarely the case however in these studies that the speech of the children with autism and the speech of the mothers were obtained in a situation in which actual verbal interactions between children and mothers took place. Instead children's speech and mothers' speech were usually studied in separation and then artificially compared. In the 1966 study mentioned above, Goldfarb and associates have obtained samples of speech from autistic and CA-matched normal children old enough to attend school (no exact ages were reported) in a structured situation (i.e., picture naming and summarizing stories) whereas the data on the mothers' speech represented the last five minutes of an open-ended interview with the mothers regarding their perception of the maternal role. A speech pathologist was asked to evaluate the children's and the mothers' speech as to pitch, voice quality, rate, phrasing, intonation, articulation, meaning, so-called mood (i.e., the question whether mood and mood communication were appropriate to situation and content) by implicit reference to the presumptive norms for children and adults in society. No measurement was made. Goldfarb and associates claim that the speech pathologist consistently rated the speech of the mothers with autistic children lower on a scale from very poor to excellent than the speech of the mothers with normal children. Needless to add that the autistic children were also rated lower than the normal children in a similar assessment. The authors concluded: "Undoubtedly, the average mother of the schizophrenic child represents a poorer speech model for her child to imitate than does the mother of the normal child" (p. 1224), which does not follow from the data unless one makes at least one additional assumption (i.e., it is meaningful to suppose that the differences observed between mothers will hold in naturalistic inter-

action with the children). All the Goldfarb's studies are not as questionable however. In an other study, Goldfarb, Yudkovitz, and Goldfarb (1973) have assembled mothers and children and presented them with the Krauss-Glucksberg referential communication task (in which the speaker has to describe particular objects or representations in such a way as to allow the listener (separated from the speaker by a screen) to pick up the right object in a display (Krauss and Glucksberg, 1969). Normal and autistic children were matched for chronological age (9 years). The speech of their respective mothers was recorded during the Krauss-Glucksberg task and analyzed for responsiveness to the child, content and style. In contrast to mothers of normal children, those of the autistic were inferior in all three aspects of communication evaluated.

Goldfarb's data are not sufficient however to decide whether the speech addressed to their children by the mothers of autistic children is deficient as a model and a feedback instrument in language development or whether it is actually adapted to the child's own level of communication. Other data have to be collected that take into consideration the relative complexity of parental speech with regard to the children's levels of language development. The problem is similar to the one analyzed above with parental speech to mentally retarded children. Additionally, it is not always the case that parents of autistic children prove inferior to parents of normal CA-matched children in tasks pertaining language and communication with their children. Haley (1968), for example, has reported that parents of autistic children do not communicate in more conflicting or contradicting ways with their children than parents of normal children when success of a child in following their instructions is measured. Similarly, Schopler and Reichler (1972) have indicated that parents of moderately or severely autistic children can reliably assess their child's level of functioning in language, motor, mental and other aspects of development. This suggests that the parents of autistic children are quite sensitive to the developmental level of their children. On this basis it might be hypothesized that they also tend to adapt to the children's level of language functioning in their communications which may be in fact what Goldfarb observed. This would also suggest that the parents can be used as pivots in a home-based approach to the treatment of autistic children. Rutter and associates, in London (Howlin, Marchant, Rutter, Berger, Hersov, and Yule, 1973), apparently disregarding Goldfarb's data, have proposed such a home-based treatment for the autistic children a few years ago.

Obviously, more data are needed before the question of the modeling and teaching value of the language of the parents with autistic children can be answered. Research should be conducted at the children's home, appropriate psycholinguistic and speech categories of analysis are needed and the communicative and linguistic levels of the children should be taken into account. Rutter and associates (Howlin, Cantwell, Marchant, Berger, and Rutter, 1973) have proposed such a compre-

hensive program, but to my knowledge no report has been published yet.

DEAF CHILDREN

As Moores (1978) notes "Educational interventions for the deaf must (then) be perceived as extending into the home and involving not only the deaf individual, but the complete family unit" (p. 120). However, as Moores also reckons, there have been very few efforts to observe systematically the impact of deafness on a child and his family. The work of Meadow (1968, 1969) and Schlesinger and Meadow (1972) are noticeable exceptions in this respect.

No data seem to have been published on the oral and gestural exchanges between deaf or nondeaf parents and their deaf (or nondeaf) children. Regarding the use of sign language, there are some reasons for explaining this lack of data. Until a few years ago, the manual communication systems have been virtually ignored by linguists, educators, and psychologists. Manual communication was dismissed as concrete, iconic, and tied to the here and now. Its use was prohibited with young deaf children for fear that it would inhibit the development of speech and the oral language. Perceptions of the nature and value of the manual communication systems, e.g., Sign language, have drastically changed in recent years with the appearance of several works on sign language by linguists (e.g., Stokoe, 1960) and the progressive realization by educators and psychologists that deaf children exposed to manual communication from an early age are superior in academic achievement, social adjustment, and oral language skills to deaf children not exposed to manual communication (Wilbur, 1976; Moores, 1978). The former children are primarily deaf children from deaf parents.

As a result, several researchers have started to study in more detail the acquisition of sign language by deaf children of deaf parents using psycholinguistic techniques and methods (e.g., Hoffmeister, 1977, 1978a, 1978b; Moores, 1978). Such studies supply extremely interesting informations not only on language acquisition in deaf children but also on language development in general as they allow to separate "experimentally" speech and language and help to enlighten general principles of language acquisition.

At the present time, there is an obvious need for systematic studies of the behavior of deaf children with their parents or caretakers in naturalistic settings. Such studies will allow to determine whether the environmental challenges for deaf children are different from those for hearing children. If differences are found, appropriate intervention strategies and parental advising and monitoring can be conceived. Moores (1978) suggested to apply an ethological approach (e.g., Charlesworth, 1974) for the study of the communicative and cognitive dimensions of the early familial environment of deaf children. Maestas

& Moores (1978, 1979) are conducting by now such a study in Pennsylvania. Mother-child interactions in families with children under 18 months are currently being videotaped and filmed and they will be analyzed for a variety of interaction patterns (including signing on the child's body, modelling, signing style, fingerspelling, singing and rhyming, cross-modal communication – i.e., from signing to speaking and vice versa – multisign utterances, adult-child dialogue, etc.). Given their young age the hearing level of all the children has not been diagnosed thoroughly. Usually deafness is not diagnosed for sure before 16 to 24 months (Crandall, 1974). Also a big proportion of children of deaf parents have normal hearing. Therefore, the researchers expect that some of the children will develop normal hearing. The study promises to give valuable informations on the early communicative patterns of deaf (or nondeaf) infant and children and their deaf parents.

LANGUAGE-IMPAIRED CHILDREN

Despite Wyatt's insistence on the role of the mother-child relationship in language delays and impairments (Wyatt, 1969), few systematic research has been conducted on the familial linguistic environment of language-impaired children.

Some evidence has been gathered by Wulbert and associates, at the University of Washington (Wulbert, Inglis, Kriegsmann, and Mills, 1975), that mothers of language-delayed children are more critical of their children, less responsive, and generally less involved. They also tend to punish or restrict their children more often than mothers of CA-matched normal and Down's syndrome children. The children were aged between two and six years. There were very few differences in the aspects mentioned between mothers of normal and Down's syndrome children. The Wulbert et al. data probably reflect the acute frustration of the mothers of language-delayed but otherwise normal children when the reasons for the delay cannot be readily understood as opposed to the majority of mothers of Down's syndrome children who by the time the children are four or five have adapted sometimes very nicely to their children's peculiarities.

As to the speech interaction itself, Cramblit and Siegel (1977) have studied the speech addressed to one language-impaired boy aged four years and his normal-speaking female cousin also aged four years and by the boy's mother, father, and female baby-sitter in a laboratory free-play and story-telling situation. There was a strong tendency in each interlocutor to present the language-impaired child with fluent, short, and simple sentence patterns, as compared to his peer. Qualitative analyses of sentence types and mean length of responses showed that simplifications made in the speech to the boy were similar to those used by mothers of normal but younger children.

Of course much more data are needed before any firm suggestion

can be made. But the above data may be taken tentatively to suggest the following hypothesis: it is very frustrating, for a variety of reasons, to deal on a continuous basis with a language delayed or language-impaired child, and several negative components of maternal attitudes toward such a child are reactions to this difficulty; however, despite this fact, it is possible that the language adjustments made by the parents of such children are sound ones, i.e. are proper adaptations to the child's level of language functioning. This hypothesis is consistent with the realization that the productive and receptive levels of language development in a child are the key variables – together with the motivational forces that draw the adults to make themselves understood (Moerk, 1977) – in controlling the adults' adaptations in communicating with children or for that matter with other unskilled code users (Brown, 1977).

As to speech and language intervention, some researchers have started to study and manipulate parent-child interaction in therapy with language-impaired children. For example, Egolf and associates at Pittsburgh University, have tried to modify parent-child interaction patterns in therapy for school-age stutterers (Egolf, Shames, Johnson, and Kasprisin-Burelli, 1972). The idea of using parents and train them to administer speech therapy or to aid in speech correction (particularly articulatory correction) is not new of course (e.g., Sommers, 1962; Carrier, 1970). But the idea here is to carry it one step further i.e. to study carefully the verbal exchanges between parents and children, and if necessary to bring about changes in these exchanges, using whatever technique is appropriate. Egolf and associates identified several negative patterns of behavior in parents as verbal aggression on the child, silence, and interruptions, which might be factors that maintain stuttering. These patterns were manipulated and reduced in frequency or eliminated in therapy with the parents. Positive reactions towards the child's verbal accomplishments were also instigated. The results of the therapy were positive and lead to increased fluency in the children's speech inside and outside the therapeutic sessions. Some evidence of prolonged effects was reported.

Such and similar studies extended to other types of language-impaired children would prove extremely useful for a better understanding of the interactive mechanisms involved in the language problems and provide valuable information for instigating therapies involving the children's families.

CONCLUSION

Within the field of language disorders and intervention, one needs to realize the *systemic nature* of the parent-child relationship. This fundamental characteristic makes it *impossible to really understand the process* of a normal or perturbed relationship between parents and child if the two sides of the relation are not taken into consideration.

Unidirectional interventions and therapies are possible – we have done them for a certain amount of time. But there is convincing evidence that more complex intervention strategies, taking into account and using the reciprocal influences of related people on one another, may be more successful in achieving therapeutic effects. Maybe, because these strategies really get at the core of the interpersonal relationship.

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