PARENT-CENTRED LANGUAGE INTERVENTION: THE EFFECTIVENESS OF TWO PROGRAMS

By

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ABSTRACT

Speech-Language Pathologists have long recognized the importance of parental involvement in intervention with young communicatively impaired children. Over the years, a wide variety of parent-centred intervention programs and options have been proven effective with this population (Fey, 1986). Yet it remains unclear which specific variables are important in determining the success of such programs.

The purpose of this study was to determine the impact, if any, of individualized support and feedback on the effectiveness of parent-centred language intervention. To answer this question, the families of 8 language-delayed children were enroled in two treatment programs, one which included an individualized component (Group II), and one which did not (Group I). Program efficacy was measured in terms of the progress shown by the children on language variables measured in pre- and post-test assessments. To compare the relative effects of the two treatment approaches, the progress demonstrated by children in Treatment Group I was compared to that shown by children in Group II.

Results yielded two major findings. First, the children whose parents received individualized support and feedback (Group II) made greater gains on specific language goals than those whose parents received group instruction alone (Group I). It was concluded that an individualized component to parental training had a measurable positive effect on subsequent language development. Second, this effect was found to be most pronounced for children functioning at early stages of language development (i.e., demonstrating a productive vocabulary of 50 words or less).
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CHAPTER I
INTRODUCTION AND LITERATURE REVIEW

I INTRODUCTION

The field of speech-language pathology has long recognized the importance of involving parents in language intervention with young children. Studies utilising parents as language therapists date from the mid-1960's (Howlin, 1984). Since that time, parental involvement in communication intervention has been extensive, both in research as well as in clinical practice. In recent years, attempts have been made to more clearly define the role of parents in therapy. These efforts have attracted considerable interest and attention.

There are several reasons for this increased focus on parents as language interventionists. First, the profession is developing a growing commitment toward more naturalistic approaches to language therapy. A second factor relates to the wide-spread move towards more collaborative methods of assessment and treatment. In addition, current pressing service delivery issues suggest several practical advantages to parent-centred intervention.

For years, many communication intervention programs focused on the teaching and practising of specific skills in the context of highly-structured language lessons. Recent trends toward a more naturalistic approach to language intervention (Duchan & Weitzner-Lin, 1987; Johnston, 1985) have strongly influenced the kind of language therapy children now receive. The importance of implementing change through the
natural language environment of the child is now widely accepted. In this context, the	ondition of an interventionist who spends much of his/her day with the child, in the child’s
world is indeed compelling. Parents and care-givers are clearly in an enviable position
for implementing therapy services in such an environment.

As stated earlier, the current shift by education and health-care professions
towards a more consultative or ‘team’ approach to service delivery, has also had
significant impact on parental involvement in therapy. Part of this collaborative approach
is a growing acceptance of family members as vital participants in the delivery of client
services. Professionals are beginning to recognize and acknowledge the value of
parental knowledge and expertise. Thus, parents’ concerns, suggestions, and
recommendations are often considered indispensable in planning and implementing a
successful intervention program.

Finally, parent-centred intervention is regarded by many as a viable time- and cost-
efficient alternative to more traditional child-centred approaches. For years, heavy
competition for limited health care resources and personnel have produced serious short-
falls in speech-language pathology services. Parent-centred treatment offers several
practical solutions to the difficulties created by this shortfall. Because parents can be
trained in groups, staff are able to reach more families in less time. This reduced time
commitment means that programs may become more accessible to people who are
depically isolated or otherwise unable to attend regular appointments in the clinic.
They also allow extension of services to families whose children are awaiting therapy, as
well as those for whom clinical intervention has been terminated (Fey, 1986).
There are additional benefits to training parents in principles of language intervention. Providing parent-centred services tend to address the needs of the whole family, rather than the child alone. Many parents require support in dealing with the difficulties in raising a child with a communication impairment. Language intervention is frequently a long-term endeavour that may over time involve several different professionals. Informed and involved parents will be better-equipped to provide consistent intervention as well as serve as consultants and advocates for their child (Johnston, 1989). In contrast, parents who are excluded from active involvement in therapy often report feelings of helplessness, inadequacy and frustration regarding their child's difficulties (Rees, 1984; Andrews & Andrews, 1989; Dockrell, 1989).

From several perspectives, parent-centred language intervention seems to be an idea that makes sense. Having established its potential, how then, do we determine its efficacy?

The type and extent of parental involvement in language intervention varies widely from one case to the next, according to the specific needs of the child, the interests and abilities of the parent, and the theoretical orientation of the clinical interventionist. Several different parent-centred language programs are currently in popular use. Most focus on modifying adult-child interaction, encouraging non-directive parental language, and providing parents with general information about communication and its development. Although these programs are widely used, relatively little is known about their efficacy.

In their reviews of the literature, Howlin (1984) and Fey (1986) conclude that while it seems that parents are highly capable of adapting their communication style in
response to treatment, actual effects on child language may be varied and inconsistent. As yet, nobody is entirely sure of the factors influencing the success of such programs. In the following section, I will present some of the issues that have been identified as possible factors.

II THE EFFICACY OF PARENT-CENTRED LANGUAGE INTERVENTION

For parent-centred intervention to be worthwhile it must succeed on two levels. First, the program must effectively teach parents to understand and apply the principles it espouses, i.e., it must result in some modification of parental behaviour. Secondly, this change must result in measurable improvement in the language skills of the child. This improvement must be greater than one would expect were there no intervention at all.

Numerous parent-intervention programs have been described in the literature. The extent to which these programs meet the above criteria is not always well-documented. In addition, pervasive weaknesses in methodology and experimental design have been identified in much of the literature to date (Howlin, 1984; and Girolametto, 1988). Nevertheless, careful examination of the research reveals many interesting findings. These are well worth our attention.

A. How well are parents able to learn and apply program principles and techniques?

Most studies agree that parents are highly responsive to intervention, at least in the short term, and can successfully modify their interactions with their children after even
minimal training. Johnson and Harrison (1990), for example, found that mothers significantly reduced their directive behaviours after using a self-rating scale to evaluate videotaped interactions between themselves and their children. Other investigators have cited immediate changes in mother-child interactions following presentation of instructional videotapes (Banigan, 1989), modelling of techniques by professionals (Fey, Newhoff & Cole, 1979), or presentation of written training manuals (Hayes, Ladzik, Sundlos & Healy, 1979). To date, reported changes in parental behaviour following training are certainly impressive. However, parents' ability to generalize and maintain this learning over time remains less well-documented.

Few studies investigate parents' implementation of intervention procedures at home and in everyday situations. Those that do, indicate that generalization can be a major source of difficulty for many parents. Salzberg & Villani (1983) found that parents in their study were able to incorporate the use of prompting, praise, and semantically contingent responses during structured tasks at their child's preschool, but that the newly acquired skills did not extend to free-play sessions at home. Likewise, Sajwaj (1973) reports that three mothers who successfully used teaching procedures in the clinic were unable to apply this training in the home. Harris, Wolchik & Weitz (1981) note that while their parents understood and accepted new teaching skills, some reported finding them difficult to integrate into their daily routines.

Not surprisingly, the more constrained or highly structured the context in which new skills are learned, the more difficulty parents seem to have applying them in 'real-life' contexts. But as Fey (1986) reports, even parents who are taught to modify their
interaction style during free-play activities with their children may find it difficult to implement techniques during daily routines such as getting dressed or making supper. Sajwaj speculates that difficulties may be related to increased demands on parents' time and attention during such tasks.

Parents' maintenance of newly-acquired behaviours over the long term also raises frequent concerns. Few studies have investigated long-term treatment effects. Those that do, are not always encouraging. For example, Harris et al. (1981) found that one year following intensive training, parents were no longer engaging in formal teaching sessions with their children.

Again, highly structured language teaching with a strong behaviourist orientation seems most difficult for parents to maintain on their own (Baker, Heifetz, & Murphy, 1980; Holmes, Hemsley, Rickett & Likierman, 1982). Sometimes parents simply reject the principles presented. Holmes et al., for example, report that of the four parents who failed to apply program methods during follow-up to treatment, three expressed apprehension regarding the techniques being advocated. Difficulty with maintenance of skills is by no means restricted to structured behavioural programs, however. One case study, for example, focused on treatment during natural interactions between a severely retarded child and her parents (Seitz and Riedell, 1974). The investigators found that despite encouraging progress during training, within three months after completing the program, the mother had returned to many of her old ways of interacting with her child. Interestingly, the father in this family more successfully maintained the new behaviours, despite having been less involved in training. This observation provides an excellent
example of the individual variation so frequently described in the literature.

One difficulty parents face in attempting to sustain long-term language intervention, is the fact that children’s needs change over time. Parents may have difficulty modifying their techniques appropriately. Baker et al. (1980) found that one year following intervention, only 15% of the parents trained had attempted to initiate teaching of a new skill to their child. Holmes et al. (1982) also discovered that several of their parents were unable to generalize the techniques they had learned to new problems. Just over half the parents reported that the methods they had learned helped them deal with new problem behaviours, and only five of the 16 families felt capable of teaching their child new skills using these methods.

The news is not all bad however. When adequate professional support and follow-through is provided, it seems that parents may demonstrate continued use of new methods long after formal training has ended. Rees (1984) found parents were able to maintain involved continual structured teaching with their children more than a year following training, provided that regular contact with teachers, speech therapists and other professional workers was available.

To summarize, it seems that while most parents are capable of changing their behaviour in response to intervention training, many have difficulty maintaining and generalizing new skills. The matter is complicated by the high degree of individual variability so prevalent in the literature. Families involved in similar treatment programs may nevertheless respond very differently. Perhaps, as Howlin (1984) remarks, the key
question should be, not *whether* parent-centred intervention works, but for *whom* it works.

What are the variables affecting parents' ability to learn and apply language intervention techniques? In discussions of the data, a number of issues emerge time after time. While there is little empirical evidence for the relative effects of different factors, they are nevertheless worth exploring. The issues can be divided into three main types: variables relating to program characteristics, parent factors and child-related variables.

1. Program variables

   Included in this category are those issues that pertain to specific aspects of the parent-training program. Some have to do with the nature of the program itself, i.e., the specific approaches to language intervention that parents are taught. This category refers not only to the specific techniques used to facilitate language growth, but also the contexts in which such techniques are used. A second area of interest is the manner in which parents are trained and informed. Third, are those issues pertaining to the ongoing relationship between parents and the speech-language professionals working with them. These three issues will be discussed independently.

   In parent-centred intervention, parents are trained to use specific techniques in specific circumstances to facilitate language growth in their children. The theoretical orientation of the clinician implementing the program will have a substantial impact on such training. It seems that parents have more difficulty dealing with some theoretical approaches than others. In general, the more highly-structured and behaviourally-
oriented a program, the more difficulty parents have using and extending the skills they learn. Fey (1986), suggests that in comparison, naturalistic child-centred approaches seem to be more readily accepted and applied.

With regards to teaching context, many researchers emphasize the need for parents to learn the incidental use of teaching techniques during events that occur naturally in the home (Baker et al., 1980; Fey, 1986; Girolametto et al., 1986; Holmes et al., 1983; Lombardino & Mangan, 1983; MacDonald et al., 1974; Rees, 1984; Salzberg & Villani, 1983). Parents who receive this type of training appear better equipped to facilitate language in new contexts and to apply techniques to new goals (Culatta & Horn, 1981; MacDonald et al., 1974).

The manner in which information is presented to parents is also significant. Highly recommended is the use of 'action-oriented' training, involving role-play, discussion, and rehearsal (Baker, 1976; Beveridge & Jerrams, 1981; Fey, 1986; McConkey et al., 1979; Rose, 1974; Rees, 1984; Seitz & Hoekenga, 1974). Having frequent opportunities to give and receive feedback about use of techniques also seems important to parents' success (Fey, 1986; Johnson & Harrison, 1990; McConkey et al., 1979; Salzberg & Villani, 1983).

Other program characteristics, such as the length of the intervention period, or the frequency and number of training sessions, remain largely overlooked. It appears that one cannot predict program success on the basis of duration and intensity of training alone. As a group, short-term (6 - 12 week) intervention programs conducted at weekly intervals (e.g., Beveridge & Jerrams, 1974; Girolametto, 1988; Harris et al., 1981) appear no more or less effective than those that offer intensive programming followed by
extended periods of professional support (e.g., Clements et al., 1982; Cooper et al., 1974; MacDonald et al., 1974; Rees, 1984). Nevertheless, these studies do not present a 'pure' comparison, in that they differ according to more than just duration of treatment. As a general observation, when we consider the many parents who experience continued difficulties following training, it seems logical to expect that many could benefit from extended professional involvement.

Finally, according to Howlin (1984), program success can be accurately predicted by the degree to which it secures family confidence and cooperation. Baker (1976), Girolametto et al. (1986), and Rees (1984) each stress the importance of fostering mutual respect between parents and professionals. If a program is to succeed, it is vital that parents view program leaders as experienced, sympathetic, and competent. Rees (1984) found that maintaining a positive parent-professional relationship helped increase motivation and reduce stress in families involved in long-term intervention with their child.

2. Parent variables

As mentioned earlier, parents are highly variable in their responses to training. To what extent can these differences be traced to characteristics of the parents themselves? To date, very few investigators have explored this issue. We do know from Howlin (1984) that factors such as socio-economic status, education level, and family-size have no apparent impact on program effectiveness. Other factors have been identified as influential, however.
Some studies have investigated the relationship between parental attitudes and success in training. Baker (1976) and Rees (1984) report that many parents, frequently as a result of previous interactions with professionals, see themselves as passive observers or co-dependents in their child's therapy. Both investigators have found that such parents have difficulty carrying out intervention programs with their children. Self-confidence may be a key issue here. Certainly, confidence has been found to affect parents' performance. MacDonald et al. (1974), for example, found that following initial success in improving their child's communication, parents were more assured in their role as interventionists, and significantly more receptive to training efforts than they had been initially.

Rees (1984) examined this issue more systematically. Parents involved in parent-centred language intervention were asked to respond to an attitudinal survey. Rees found that parents characterized as open, innovative, and persistent (according to the scale), made more successful language teachers than those who scored lower on these traits. They had better attendance and follow-through during training, and were more likely to seek help when they needed it. In addition, it was the children of these parents who demonstrated the greatest language gains at the end of treatment.

Parental perceptions of the child may also play a significant role. For example, Seitz & Riedell (1974) found that a family's exaggerated view of their child's dependency and need for structure had a detrimental effect on intervention and led to initial rejection of a number of program suggestions.
3. Child variables

Child characteristics that may affect parents' ability to carry out intervention can be grouped into four main areas. These are: disorder type, age, social ability, and rate of progress.

Although Baker (1976) suggests that families of developmentally delayed children are the most likely to participate in parent training programs, there is little to indicate that disorder type has a measurable affect on parental ability. Successful parent intervention has been reported for children demonstrating a wide variety of disorder types. These include mild-severe mental handicap, specific language impairment, hearing impairment, autism, and multiple-handicaps. Efficacy of different programs can not be compared on the basis of this variable alone.

One child-related variable that has been found to affect parents' performance is age. Rees (1984) found that parents of younger children were more pliant and had less difficulty generalizing teaching skills than parents whose children were older. Fey (1986) also reports that parents have less difficulty employing program techniques with children who are younger and at an earlier stage of language development. He postulates that the language goals appropriate for children at this stage of development (e.g., vocabulary development, early word combining, etc.) may be relatively easy for parents to understand and target. More advanced goals may be more challenging.

The social skill of their child is strongly related to parents' ability to apply intervention techniques. Baker (1976) observes that parents have difficulty working with children who demonstrate high levels of oppositional behaviour. Girolametto also found
that parents whose children demonstrated good social-conversational skills were more successful interventionists than those whose children did not. One would expect effects of this nature to be particularly evident in programs that stress intervention in the context of naturally-occurring parent-child interactions.

Not surprisingly, it appears that parents are highly motivated to teach their children when they make rapid progress. The parents who continue using new techniques and skills over time are consistently those whose children show the greatest initial improvement (Baker et al., 1980; Howlin, 1974).

4. Summary: effects of intervention on parent performance

At the beginning of this section, I asked how well parents were able to learn and apply program principles. Overall, it appears that parents are most successful under the following conditions:

1) when the training program encourages parents' active discovery and discussion of teaching principles, focuses on techniques that can be used in daily, unstructured activities, and promotes an atmosphere of mutual trust and respect between parents and professionals,

2) when parents have confidence in their abilities as language interventionists, and are optimistic about their child's potential for progress, and

3) when their children demonstrate good social-interaction skills, and are still in the early stages of language development.
Although in the interests of simplicity I have grouped these factors into three separate classes, the issues are by no means distinct. Inevitably, program variables, parent traits, and child characteristics must interact. In fact, the match between program principles and family needs may be what ultimately determines the success of intervention. A study by Johnson & Harrison (1990) illustrates this nicely. Their program focused on encouraging non-directive parental behaviour during parent-child interactions. Parents' performance was evaluated before and after intervention. The parents who showed the greatest change were those who initially demonstrated the highest amounts of directive language. In contrast, parents who were already using a non-directive interaction style before treatment showed less dramatic change. Clearly, program goals were more ideally suited to the first group of families. Successful matching of program goals to family needs may be a key issue in attempting to explain the individual variability reported so frequently in the literature. This point will be addressed more fully later in the chapter.

B. Do children's language skills improve following parent-centred intervention?

Assuming that most parents can learn to use language intervention techniques, we must next ascertain the effect such intervention is likely to have on language development of the young child. As mentioned earlier, the literature is fraught with experimental and methodological problems that make this difficult to determine. One of these is that so few studies use control groups or multiple-baseline designs to control for possible effects of
maturation. A second common difficulty is in the area of language measurement and data collection. A number of studies use parent-child interactions to evaluate changes in child language following treatment (Banigan, 1989; DiStefano et al., 1990; Girolametto, 1988; Johnson & Harrison, 1990; McConkey et al., 1979; Salzberg & Villani, 1983; Seitz & Hoekenga, 1974). The error in this logic is obvious. Pre- and post-test data must be collected under identical circumstances if comparison is to be meaningful. If parental interaction style is the focus of intervention, then presumably it may change over this interval. Thus we have no way of knowing whether observed changes in child behaviours reflect actual changes in linguistic ability or whether parents have simply become more adept at eliciting representative language samples.

I could find only six studies that managed to avoid these two major pratfalls. Taken as a group, the results of these studies are somewhat contradictory. Some investigators report significant improvements in language ability following treatment. Harris et al. (1981), for example, used a short assessment period to monitor verbal changes in autistic children prior to and following the onset of treatment. No gains on a 21-step hierarchy were observed during the assessment-only condition, whereas improvements occurred rapidly once treatment began. Rees (1984) used the Reynell Developmental Language Scales (Reynell, 1969) to compare language gains of children receiving home-based intervention to those involved in alternative programs. He found gains in both comprehension and production of language to be superior for the home-based intervention group. Similar findings were reported by Beveridge & Jerrams (1974), who used performance on the Reynell and the EPVT to compare the effects of parent-centred
intervention to those of a school-based program.

Other findings have been less encouraging. Clements et al. (1982) failed to find significant differences between experimental and control groups on either the Reynell or the language portion of the Griffiths Scales. The investigators report that any improvements that did occur were generally limited to increases in the children's vocabulary. Length and complexity of children's utterances remained unchanged. Likewise, Girolametto (1988) was unable to differentiate intervention and control groups on the basis of performance on the SICD.

Another study is more difficult to interpret. Cooper et al. (1979) found that children involved in a home-based program achieved greater language gains overall than a group who received no intervention. However, individual differences were prevalent, with some children from the no-treatment group showing equal or greater progress relative to their counterparts who received intervention. Fey (1986) and Howlin (1984) complain that the statistics used in this study make it impossible to conclude that the gains of children in the experimental group actually exceeded those who received no treatment.

To date, results regarding the effects of parent programming on child language development are inconclusive. There is clearly a need for more strongly controlled studies to examine this issue. What we can conclude from the above findings is that different children seem to respond very differently to intervention efforts.

What are some variables that may account for these differences in children's responses to parent-provided therapy? In the last section, I identified several parent-related, child-related and program-related factors that seem to affect parent's learning of
skills. One would expect these also to have significant impact on child language gains during treatment. Children are unlikely to respond if their parents do not. It is important to note however, that the performance of the child is not always related to that of the adult (Howlin, 1984; Girolametto, 1988). Sometimes children fail to progress as expected despite the best efforts of their care-givers. Evidently there are additional factors at work. Those identified in the literature can be grouped into two categories: child characteristics and program variables.

1. Child variables

Two main characteristics affecting children's response to parent-centred treatment are the language level of the child, and the child's cognitive ability.

It appears that children demonstrating at least some use of verbal language are in general more responsive to intervention than pre-verbal children (Howlin, 1984). Harris et al. (1981) found that autistic children showing even minimal verbal imitative speech made greater gains during treatment than those who were completely non-verbal.

Fey (1986) observes that severely language-impaired children functioning at early stages of language development (i.e., single-word and early combined utterances) tend to be more responsive to parent-centred treatment than more linguistically-advanced children. This finding will be addressed further in my discussion of program variables.

The impact of cognitive ability on efficacy of language treatment is as yet debatable. Some authors have found that children with severe cognitive delays fail to show significant language gains in response to intervention (Clements et al., 1982;
Weistuch & Lewis, 1985). Others report excellent results with this population (Cheseldine & McConkey, 1979; MacDonald et al., 1974; Rees, 1984; Rose, 1974; Seitz & Hoekenga, 1974). The key element here may in fact be time. Cooper et al. (1981) found that their cognitively delayed children improved significantly in response to treatment, but that these effects were simply slower to emerge than for children without cognitive delays. Weistuch & Lewis (1985) report similar findings.

2. Program variables

An important component to most intervention programs is the identification and teaching of specific treatment goals. Although goal selection is usually based on the particular needs of the child, it also depends to some extent on the theoretical orientation of the interventionist. It seems that goals in some language areas tend to show greater progress in parent-centred intervention than do others.

On balance, programs that focus on teaching vocabulary and early word combinations generally have better results than those that target more complex language structures. Fey (1986) notes that parents’ efforts to train specific morphological and syntactic forms to more linguistically advanced children have not always met with success. Howlin (1984) also notes that children who receive assistance in the areas of vocabulary and phonology seem most amenable to parent-centred intervention.

3. Summary: effects of intervention on child language development

Do children’s language skills show measurable improvement following parent-
centred intervention? The need for further research in this area is strikingly clear. Nevertheless, some general conclusions may be drawn. From the findings to date, it seems that children's responses to treatment vary widely from one study to the next. This variability seems related to both child characteristics as well as specific program variables. Overall, the most successful programs seem to be those directed toward children functioning at earlier stages of language development. Lexical development and early sentence production are the areas in which children appear most responsive to parent intervention.

C. Conclusions regarding the efficacy of parent-centred intervention

What summary statements can be made about the efficacy of parent-centred language intervention? Overall, it seems that parents can indeed learn to use language intervention techniques with their children, although many need extra support in order to generalize and maintain these over time. Furthermore, many children respond positively to intervention of this type, showing measurable gains in language ability following treatment. However, these effects are not universal. Many families fail to benefit (at least in a measurable way) from parent-centred teaching. No single set of variables can be identified to account for such differences. Rather, individual variability seems to be a function of the complex interaction between aspects of the training program, language structures being targeted, teaching methods used, and characteristics of both child and parent.

How then are we to minimize the effects of such difficulties when designing
treatment programs? An important factor may be the degree to which programs address the specific needs of the individuals involved. Accordingly, one might ask whether parent-centred programs prove more effective when they provide some degree of *individualized* instruction and support.

### III GROUP VERSUS INDIVIDUAL INTERVENTION

#### A. **Group Training**

There are several advantages to working with parents in groups. The most obvious is that it offers time and cost-efficient use of professional resources. Group instruction clearly allows provision of service to more families in less time. But there are additional advantages. First, group sessions provide opportunity for peer support and encouragement. This is important for families who may be struggling with the frustrations of dealing with a needy child or suffering from feelings of isolation (Dockrell, 1989). Second, group training easily lends itself to more active learning of program principles by making feasible the use of films and tapes, modeling, role play, and group problem-solving (Baker, 1976). Finally, group instruction exposes parents to a wider range of personal experiences, and allows information-sharing about common concerns, (e.g., community resources, behavioural issues, and expectations for the future). Group favour and support is sometimes regarded by parents as the most positive aspect of training, and may often function as a powerful incentive for continued involvement in the program (Baker, 1976).
Numerous studies have made effective use of group instruction in parent-centred language training. Mash & Terdal (1973), for example, used videotapes to teach facilitative, nondirective forms of play to a group of mothers. Video-taped parent-child interactions were presented to groups for discussion and evaluation as a means of illustrating basic intervention strategies. Rose (1974), Beveridge & Jerrams (1981), and Scherer, Hansen & Timler (1987) have also found the group format effective in teaching parents a variety of facilitative techniques, from behaviour modification strategies, to the use of story-telling and finger plays to develop child language skills. While all these programs encouraged home practice and subsequent discussion, no attempts were made to observe the family directly or to modify the program to correspond to the specific needs of a child or his/her parents.

Despite the benefits of group instruction, there are disadvantages as well. The most obvious drawback is that the clinician's input is one step removed from the intervention the child receives. The professional is not present during parent-child exchanges, and so is unavailable to help identify and solve problems that may be unclear to the parent. Nor is the speech-language clinician able to monitor the child's response to treatment as it progresses, or to help parents modify their methods accordingly. These benefits are possible only in more individualized approaches to intervention.

B. Individualized Parent Training

Individualized instruction, while less cost-effective than group training, allows the speech-language pathologist to observe parent-child exchanges, to demonstrate
techniques to parents, and to provide them with immediate feedback and support. In addition, this format enables parents to learn and practice techniques at home. Parents seem to benefit greatly from this approach. Salzberg & Villani (1983) comment that parents are more likely to generalize their use of techniques when the training environment more closely approximates the natural environment. They maintain that the parents in their study needed home instruction, demonstration, and on-the-spot professional feedback before they were able to extend their use of newly-learned skills.

In addition, personalised training permits acknowledgement of parent's specific strengths and weaknesses. Rees (1984) concludes that parents involved in intervention of this type gain as much from individual programming as their children. Often they require differing amounts of time with professionals, not only because of their child's level, but also because of individual parental needs. Cheseldine & McConkey (1979) help illustrate this point. They demonstrated that while some parents needed help adopting useful teaching strategies with their children, others were able to spontaneously and successfully change their use of language in order to achieve language objectives on their own. If individualized support can be used to identify parents for whom additional training is unnecessary, while providing extra help for those who need it, perhaps it is more cost-effective than it first appears. At the very least, it allows professionals to tailor their program to meet the specific requirements of the families they serve.

Some additional studies that report successful outcomes in response to individualized parental instruction include those by MacDonald et al. (1974), Seitz & Riedell (1974), and Cooper et al. (1976).
C. **Group Training plus Individualized Support**

A number of investigators have attempted to maximize benefits by combining both group and individual training. In programs of this type, group sessions are generally used to foster support, discussion, and contact between parents, as well as to introduce and provide practice for new techniques. Individual sessions focus on fine-tuning aspects of the intervention program to accommodate specific family needs. Modeling and feedback regarding use of techniques by parents is an important component to this individualized support.

Programs of this type vary primarily according to the degree to which individualized training is emphasised. Many programs focus primarily on the group format, providing individualized attention merely as a supplement to group sessions. The Hanen Early Language Program (Girolametto et al., 1986) for example, consists of eight 3-hour group sessions followed by three video-taped home visits. Other programs that provide individual support as an extension to group instruction include those studied by Lombardino & Mangan (1983), Weistuch & Lewis (1985), and Tiegerman & Siperstein (1984).

Other programs emphasize individualized parent training and support as the primary focus of treatment. In these programs, group sessions typically occur less frequently than individualized visits, and are used mainly to address general concerns or to follow up on families who have already completed more intensive training (e.g., Harris et al., 1981; Rees, 1984; Wilcox, 1979).

Each of these approaches appears to have met with some measure of success.
IV CONCLUSIONS

The findings of most of the studies reviewed in this chapter suggest that, under the right circumstances, parents can serve as powerful and effective language interventionists with their children. These studies have examined a wide range of programs, developed from a wide range of clinical and theoretical perspectives, and addressing a wide variety of family and child needs. The effects of various program, child, and parent characteristics on treatment efficacy are not yet clearly understood. It appears that success of intervention is highly variable from one study to the next.

One important factor influencing program success may be the degree to which it addresses the specific needs of the individuals involved. Many programs provide an individualized component to treatment; the amount of individualized attention offered varies from one program to the next. Unfortunately, the effects of individualized support and attention on treatment efficacy remains largely undetermined.

V. RESEARCH QUESTION

Despite the obvious implications for those of us involved in language intervention with families of young children, there is virtually nothing in the literature that addresses the relative efficacy of different parent-centred treatment approaches. As we’ve seen from this review, studies to date seem to have concentrated exclusively on determining whether or not parent-centred language intervention ‘works’. The results indicate that while parent-centred approaches to intervention are frequently successful, there are
evidently numerous factors that affect the *degree* of program success. These factors are in need of further clarification and study. While there are many issues worthy of investigation, this thesis has chosen as a basis for comparison the influence of individualized support and instruction on overall program effectiveness.

This study was designed to investigate the following question:

*Is a parent-centred language intervention program that provides information with regards to goal selection, teaching activities, and use of facilitative techniques, more effective when it includes individualized feedback and support rather than group instruction alone?*
CHAPTER II
THE INTERVENTION PROGRAM

I INTRODUCTION

Over the years, many approaches to parent-centred language intervention have emerged. These programs differ according to a number of parameters. As we have seen in the previous chapter, interventionists subscribe to many different theoretical orientations, target a wide range of treatment goals (for both parent and child), and make use of a variety of teaching methods and techniques.

Despite their differences, all developmental language intervention programs share a common goal: they seek to facilitate positive change in the language abilities of the child. The success of an intervention program is defined by the extent to which this goal is met. The intervention program used in this study was no different. Its ultimate purpose was to facilitate accelerated communication development in children demonstrating language impairment. Accordingly, its outcome was measured in terms of the language progress shown by the children receiving treatment.

Because this intervention was parent-centred, it also involved a second, more immediate goal. This goal focused not on the child, but on the parent. Most traditional language therapy is child-centred, i.e., the clinical interventionist interacts directly with the child in order to effect change. In parent-centred intervention, the clinical interventionist effects change indirectly, not through the child, but through the parent. Intervention becomes a two-step process, the first step being to help the parent become a more
Thus, in order to achieve its ultimate goal of facilitating changes in child communication, this program first aimed to train and empower parents as the agents of change. This more immediate goal was achieved in three ways. First, the program provided parents with the \textit{knowledge} they needed in order to facilitate language growth. In practical terms, this meant not only providing parents with relevant information, but also presenting it in a meaningful way that promoted understanding and acceptance. Second, the program gave parents the \textit{skills} they needed in order to effect change. This involved supplying opportunities for parents to apply their knowledge, to practice new skills, and to receive meaningful and constructive feedback. Finally, the program sought to develop parents' self-confidence and motivation to ensure effective and independent \textit{use} of skills and knowledge. Parents who have confidence in their role as language interventionists are highly motivated to continue in this capacity. Thus the program emphasized parents' abilities and provided frequent opportunities for success.

Because so much of the success of this program rested on parents' ability to learn and apply new information, careful consideration was given not only to \textit{what} parents were taught, but also to \textit{how} they were taught. Training methods have important implications for success because they affect parents' ability to acquire knowledge, to learn new skills, and to apply these skills independently and with confidence. The methods used in this program will be described in the following section.
II PROGRAM PRESENTATION - HOW LEARNING WAS FACILITATED

A. General Philosophy

Training sessions were conducted with the assumption that parents were to be active participants in the learning process, capable of assuming responsibility for their own progress. It was also assumed that parents, being successful communicators themselves, came to the intervention process with considerable knowledge regarding communication. This intuitive knowledge was acknowledged and used whenever possible. Thus parents were strongly encouraged to introduce their own topics of interest, to raise questions and concerns, to engage in problem-solving activities, and to evaluate themselves and others. They were also encouraged to act as resource people for one another.

The role of the speech-language pathologist in this process was primarily one of facilitator. Most learning occurred in the context of informal discussion and parent-centred activities. The instructor's function was not to simply tell parents what they should do. Rather, her task was to address parents' concerns, provide structure and direction to discussions, demonstrate new concepts, and help identify and solve potential problems. She also helped summarize, clarify and organize new information. Written hand-outs were distributed each session, and served a similar function.

The philosophy of training just described was concerned not only with parents' successful acquisition of knowledge and skills. It was also concerned with promoting an atmosphere of mutual respect and trust among participants. This atmosphere helped foster the feelings of confidence and support so essential to parents' success as language
interventionists with their children.

B. Training Methods

There were two main components to the intervention program. First was the group program. This was conducted through weekly group meetings, and served two main purposes: efficient exchange of information with parents, and provision of a supportive environment in which families were able to share experiences and learn from each other. A second component to intervention was individualized home training. This allowed for individualized feedback and demonstration of information covered in the groups. Although all the families participated in group sessions, only half were involved in this second aspect of training.

Group and individualized program components will be discussed separately.

1. Group program

Group training consisted of a series of weekly two-hour meetings held over a period of six weeks. Groups met in the evenings to encourage attendance of both parents, and were led by the investigator, a speech-language pathologist. Although personalized advice and feedback were not offered during this portion of the program, one should note that the investigator was somewhat familiar with the participants through her involvement in screening and assessing their children prior to treatment.

Each group consisted of five to ten mothers and fathers (children did not attend these meetings). Groups were fairly heterogeneous with respect to language level and
severity of the children.

a. Session format:

Although the content varied from one session to the next, most followed the same general format. A typical group meeting included the following elements:

(1) Introduction and discussion of session agenda
(2) Discussion of previous week's homework and review of material covered in previous session
(3) Presentation of new material
(4) Break (socializing and informal discussion)
(5) Application and practice of new material
(6) Review and discussion of homework for the week

(based on Girolametto et al., 1988)

Parents were encouraged to take an active role in session planning. Changes to the agenda were frequently suggested, discussed, and when appropriate to group concerns, implemented. Modifications included such things as the addition of special topics for group discussion, or changes in time allocated to specific topics.

b. Learning activities:

People seem to learn best through active discovery and experience of new ideas. This program made use of a number of active learning techniques. Many of these come highly recommended by researchers in parent-centred intervention (Baker, 1976; Fey, 1986; Girolametto et al., 1988). They included group discussion, brainstorming, role-play,
Traditional lecture style was used only occasionally, to introduce new topics or to supplement and organize information presented through other means. For instance, in Session VI, parents received a brief lecture on use of story-time to target language goals. This occurred only after parents had viewed a video-taped sample of a mother reading to her child, and engaged in group discussion regarding her intended goals and her use of intervention strategies.

The above learning activities served two functions, to present and explain new ideas, as well as to provide opportunities for practising new skills.

Presentation of new material was accomplished in a number of ways. As mentioned earlier, the program recognized parents' considerable intuitive knowledge and skill with respect to communication, and strove not to teach parents, but to bring this knowledge and skill to a more conscious level. Thus parents were encouraged to discover teaching methods on their own through role-playing, analysis of videotaped adult-child interactions, brainstorming, and guided discussion. For example, during the session on use of non-directive interaction techniques, parents were asked to carry on a three-minute conversation with a partner without asking questions. Subsequent discussion focused on the various strategies demonstrated by parents during this task, and on how these strategies might be used to encourage language production in children.

Parental practice of new techniques was accomplished through role-play and group
problem-solving activities, as well as through homework activities and subsequent discussions with the group. Parents were encouraged to evaluate their own performance and that of others, to request clarification and advice where necessary, and to help identify and provide solutions for problems encountered by other group members.

2. Individualized Program

Individualized training began following completion of the group program, and consisted of six weekly sessions conducted in the participants' homes. Sessions took place at home (as opposed to the clinic) for two reasons. First, home visits allowed practice and modelling of intervention techniques in the setting where they would be applied, and incorporated daily household routines and materials. Second, home-training encouraged the participation of additional family members, particularly siblings, in activities and procedures.

The underlying goals and assumptions of the individual program were no different from those of the group sessions. Home visits were simply an extension of the intervention program. They were intended to supplement and reinforce information presented in group meetings and to provide additional support and feedback for parents. As in the group program, parents were encouraged to take an active role in planning and directing the sessions, and in bringing forward special needs and concerns. The emphasis was on parents' active discovery and practice of language intervention principles with their children. The clinician provided assistance by observing parent-child interactions, giving feedback and suggestions, and demonstrating specific techniques and
activities where necessary.

Parents participating in this segment of the program were videotaped twice during interactions with their children. Parents and clinician then reviewed and discussed the tapes together. These tapes were used to encourage parents' self-evaluation, as well as to illustrate and support observations made by the investigator.

Summary of program presentation

To summarize, this parent-centred language program sought to equip parents with the knowledge and skills necessary to become language facilitators, as well as the power to use them. It focused on parents' active discovery and experience of principles of language development and methods of intervention. Parents were encouraged to take joint responsibility for program content and organization. They were also prompted to identify problems and seek solutions, not only for themselves, but for others in the group as well. The program aimed to promote parents' understanding and application of language intervention techniques with their children. In addition, it sought to provide an atmosphere of support and acceptance, and to foster feelings of confidence and ability in its participants.

Having discussed how such learning was accomplished, we will now turn our attention to what precisely this program set out to teach parents.
The challenge in this project was to communicate to parents, clearly and effectively, a comprehensive approach to language intervention. This involved instilling a sense of the underlying aims and principles of intervention, as well as providing a set of procedures and strategies to assist in their implementation. I will preface my description of these principles and techniques with a brief discussion about the underlying theoretical assumptions and beliefs.

A. Underlying Assumptions

Language intervention must be defined within the context of a theoretical framework. The intervention model presented to the parents in this study was based on a specific set of beliefs and opinions regarding the nature and role of intervention. This orientation was itself derived from broader theoretical assumptions about language learning, and language impairment. Four basic principles formed the foundation of this intervention model.

The first and most important of these was that the essence of language is communication. Language is a communicative tool that is acquired in the course of natural social interactions. Functional communication is what motivates the acquisition and use of language (Girolametto et al., 1988; Johnston, 1985; Snow et al., 1984).

The second basic premise was that language learning involves the child's active construction of rules. Language is a system of abstract rules and patterns. Those acquiring language do so by actively searching for these patterns, and constructing their
own sets of rules based on their analysis of linguistic events (Bowerman, 1982; Johnston, 1985; Newport et al., 1984; Slobin, 1985). Over time, the child’s system becomes more closely matched to that of experienced language users.

Third, this learning is not only active, it is also self-regulated. There is strong evidence that children selectively focus on certain aspects of the linguistic system at certain times (Newport et al., 1984). To a large extent, this selection is based on prerequisite knowledge. What a child already knows about language determines what she is ready to learn next (Johnston, 1985; Nelson, 1977). For this reason, language acquisition generally follows a predictable developmental sequence. But there is also considerable variability within this sequence. Numerous additional factors influence the selection process, such as the child’s level of cognitive development, her individual learning style, and the specific social purposes most important to the child (Peters, 1983).

Finally, language disordered children acquire language in the same way as other children, except that they are slower to discover patterns and rules. That is, language-delayed children use language for the same reasons, follow the same general sequence of acquisition, and eventually formulate the same rules as other children. But for these children, the process requires significantly more effort and time. There are many theories regarding the source of this difficulty. Current research suggests that language-impaired children may be poorly equipped to discover language rules primarily due to processing difficulties, more specifically, impairments of attention, memory, and auditory perception (Johnston, 1988).

The above principles hold important implications for child language intervention.
They lead to the following conclusions:

1. Because language-disordered children show delayed rather than deviant acquisition of language skills, the ultimate purpose of intervention is (as stated earlier) to accelerate the course of language learning. To accomplish this, it must aim:

2. to simplify the child's task of discovering and formulating the rules of language,

3. to do so without sacrificing its communicative purpose and interactive nature,

4. and to address communicative targets appropriate to the specific priorities and abilities of each child.

These aims were what shaped and defined the language-intervention program shared with the parents in this study. From these aims were derived a basic set of intervention strategies.

B. Basic Intervention Strategies

As previously stated, this program set out to provide parents with a model of language intervention, including practical suggestions about techniques for facilitating language growth in children. The information and suggestions that were presented in group and individual sessions can best be divided into three main categories. First, the program helped parents identify strategies for developing and maintaining a non-directive interaction style with their children. Second, it provided suggestions for selecting and teaching appropriate language targets. Finally, it presented ideas for incorporating language learning in naturally-occurring contexts. Each of these three areas will be
discussed separately. For each, a brief rationale, as well as a description of specific suggestions and procedures will be presented.

1. Developing a non-directive interaction style and responding in a semantically-contingent manner to child interests and initiations.

   Reduced adult directiveness and responding contingently to child-initiated topics have been widely and consistently correlated with increased child output and improved language ability (Chapman, 1981; Cross, 1984; Lieven, 1984; Mirenda & Donellan, 1986; Norris & Hoffman, 1990; Wade & Haynes, 1989). As a result, many intervention programs stress the importance of following the child's lead in interactions, acknowledging the child's communicative intents, and providing semantically contingent responses to child-initiations (Cheseldine & McConkey, 1979; DeStefano et al., 1990; Girolametto et al., 1986; Johnston, 1985; Johnson & Harrison, 1990; Wilcox, 1989).

   By following these suggestions, one effectively allows the child to direct the communicative interaction. But how does this help to facilitate language development? Referring back to our assumptions about the aims of language intervention, we can see that this strategy actually succeeds at many levels. First, because it is the child who initiates the interaction, we can be sure that the communicative exchange serves a meaningful purpose for her. Adult-initiated exchanges do not carry the same assurance. Second, interaction that is contingent on child-initiations allows the child to establish and control the topic of conversation. Language that emerges from topics selected by the child is far more likely to address her specific needs, interests and abilities than those
chosen by an adult. Finally, language that occurs in the context of a child-initiated and semantically-contingent interaction may help to simplify the child's language learning task. This simplification happens in two ways. A child participating in an interaction is simultaneously involved in two sorts of activities. At the conversational level, she is communicating messages to the adult, and responding to messages received. At the linguistic level, she is engaged in analysis of the adult input, attaching meanings to forms, and experimenting with these forms in her own productions. A child-oriented interaction helps to simplify both tasks. First, it reduces the processing load necessary to participate in the conversation. Because adult language is contingent on the child's preceding utterances, uses similar vocabulary and syntax to that produced by the child, and often occurs in the context of a familiar framework or routine, memory and comprehension loads are reduced, making it easier for the child to take her conversational turn. This leaves more processing 'space' for analysis and production of more complex language. In addition, a shared focus of attention helps to clarify the adult's meanings and intents, thereby assisting the child in the interpretation and analysis of linguistic input (Tomasello, 1988).

One might argue, of course, that shared focus can be achieved equally well by directing the child's attention to adult initiated topics. There is evidence however, that this directive approach is far less effective. The child may be unwilling or ill-equipped to switch her attentional focus, resulting in considerable expenditure of energy and concentration by the adult as well as the child. In addition, attending to someone else's topic of choice may impose a heavy cognitive burden on the child, since it requires prior
decoding of the other's message in order to discover the new focus of attention (Rocissano & Yatchmink, 1983 - cited in Girolametto et al., 1988).

As we've seen, the literature provides ample support for non-directive interaction as a language facilitation strategy. Accordingly, one aim of this intervention program was to help parents adopt a less directive style with their children. At a practical level, parents received information and suggestions about the following:

1. **Watching for and recognizing the child's attempts at communication**, including ambiguous and non-verbal behaviours.

2. **Encouraging child-initiations** by reducing adult-initiations, manipulating the environment to enhance the need for communication, and responding to initiations immediately and appropriately.

3. **Following the child's lead** by getting down to her physical level, sharing toys and activities, and talking about the objects and events that have her attention.

4. **Reducing parent's use of the following directive language behaviours**: questions, mands, prompts, imperatives, and corrections.

5. **Increasing parents' use of non-directive language behaviours**. These were defined as follows:

   - **Imitation** - any utterance that repeats exactly, or in part, one of the child's utterances of a preceding turn (DiStefano et al., 1990).

   - **Modelling** - any utterance that repeats the semantic content of the child's preceding utterance, but utilizes a more appropriate or advanced linguistic form.

   - **Expansion/Extension** - any utterance that incorporates additional semantic material
with an imitation of the child's preceding utterance (Cross, 1977).

*Parallel talk* - labelling/naming of people, objects or actions to which the child is attending, or comments-utterances describing the behaviour, actions, feelings, appearance, etc. of the child (Duchan & Weitzner-Lin, 1987).

*Self-talk* - comments-utterances describing aspects of the behaviour, actions, feelings, appearance, etc. of the adult, to which the child is attending (Hanen Early Language Parent Guide Book, 1983).

Helping parents to develop a non-directive interaction style, and an increased sensitivity and responsiveness to children's communicative behaviours constituted a major part of this program. The above methods provided parents with a solid grounding in the basics of language intervention. These techniques were general enough to be used with any child, in order to encourage communication and facilitate language growth. Having established these *general* strategies, the program then went on to provide parents with some means of addressing their child's *specific* language needs.

2. Identifying, selecting, and facilitating learning of specific language forms.

As we've established, language-impaired children frequently encounter difficulties in their recognition and use of linguistic rules and patterns. Such children often need help in order to focus on the pertinent aspects of language and communication. While the strategies described in the previous section expose the child to meaningful language at an appropriate developmental level, it fails to provide the concentrated focus on specific
forms and structures that many children need.

To accomplish this aim, the interventionist must first determine which specific aspects of language are most pertinent for a given child at a given point in time. These aspects then become the goals or targets for learning, and the focus of the parents' intervention efforts. In this program, the parent-interventionist learned to draw the child's attention to these forms and behaviours in three ways: by creating a communicative need and opportunity for their use, by providing frequent models, and by making them more salient to the child.

Selection of appropriate learning goals can be a difficult task, even for experienced interventionists. For parents, relatively unsophisticated in their knowledge and analysis of child language, it is especially challenging. The literature shows that even parents who interact non-directively and respond contingently to their children may need help in determining their child's level of ability and adjusting their language and expectations accordingly (Andrews & Andrews, 1987; Cheseldine & McConkey, 1979; Clements et al., 1982; McConkey et al., 1979; and McDade, 1981). Furthermore, these studies demonstrate that when parents are helped to set goals for themselves and their children, significant progress may be expected (Wells, 1990).

With these facts in mind, this intervention program strove to provide parents with a principled method of selecting and teaching language goals for their children. Recommended methods and procedures were based on Johnston (1985), who identified three guiding principles for successful language intervention. These were: that instructional goals must fit the child's social purposes, interpretive resources, emergent
meanings, and cognitive style; that intervention must utilize focused linguistic input, to narrow the child's search for order, and simplify his rule formulation task; and that intervention must provide children with functional language tools. These principles were founded on the theoretical assumptions regarding language intervention discussed at the beginning of this section.

Based on the above principles, instruction to parents focused on the following:

a. **Deciding What to Teach**

   (1) *Matching the child's language level.* An entire session was devoted to language acquisition in normal and delayed children. Parents were provided with developmental information for a number of language areas, including Lexical and Relational Semantics, Discourse/Pragmatics, Syntax, and Morphology. Parents were assisted in determining their child's current language level and identifying their place in the developmental sequence. They were then encouraged to identify language targets at or slightly above the child's level.

   (2) *Matching the child's interests and purposes.* Parents were asked to watch for words and ideas their children were attempting but having difficulty communicating. They were also encouraged to choose targets that could be used on a daily basis during activities the child enjoyed.

b. **Teaching Suggestions**

   (1) *Matching the child's interests and abilities.* Parents were advised to target language in the contexts of play and favourite daily routines. General principles that had been introduced in previous sessions were reiterated (e.g., following the child's lead and
taking a non-directive role in interaction).

(2) Teaching in a functional context. Parents were given suggestions for taking advantage of natural interactions as they occur, and for encouraging initiations by creating an honest need for communication (e.g., 'forgetting' to pour the child's milk).

(3) Helping the child focus on a new skill, pattern, or word, by:

- choosing activities that emphasize the target skill or structure,
- providing clear and frequent modelling,
- using intonation, repetition, sentence position, visual reinforcement, etc. to draw attention to the target form.

c. Maintaining Teaching Over Time

Language development is a long-term process, and a child's communication needs and abilities are expected to change greatly over time. In fact, the aim of intervention is to hasten this process. Thus parents must be prepared to change their expectations and activities as needed. Parents in this study were taught to carefully monitor their child's progress with regards to specific goals, and to make modifications as necessary.

The final focus in parent training related to specific situations in which intervention procedures were to be implemented.

3. Using language facilitation techniques during daily routines and activities.

We know that children learn language best in meaningful and familiar settings. The research indicates however, that parents involved in language therapy frequently
have difficulty transferring newly-acquired teaching skills to such settings (Baker et al., 1980; Harris et al., 1981; McDade, 1981; Sajwaj, 1973; Salzberg & Villani, 1983). For these reasons, this intervention program stressed the incidental use of language facilitation techniques and teaching principles in a variety of naturally-occurring contexts. One third of the program was devoted to heightening parents' awareness of potential teaching opportunities, and to helping them make daily activities and events more facilitative to language growth.

The program worked to develop an appreciation that language intervention can occur during any communicative interaction. With this in mind, it helped parents to identify naturally-occurring events that might be seen as opportunities for language learning. These included the following: play, music, daily routines such as bathtime and meals, and story activities.

For each activity, a number of language forms and concepts were determined that might serve as potential learning targets (e.g., for parents interested in increasing their child's production of verbs, *eat, drink, taste, chew, cut, and pour* are just a few of the words that might easily be targeted during mealtime). Parents were helped in the selection of materials (e.g., toys, recordings, books, etc.) appropriate to their child's language needs. In addition, participants were given numerous opportunities to plan and practice their use of facilitative techniques during these activities.

C. **Individual vs. Group Treatment**

As mentioned earlier, parent training was conducted during group sessions and,
for some families, individual home visits. These two types of training were identical in terms of philosophy and principles, and highly similar with regards to information content. Where the two formats differed was in their focus of attention.

Whereas group sessions addressed general group concerns and interests, individual visits focused on the specific needs of the parent and child. Parents were observed during interactions with their children, and provided with feedback, suggestions, and demonstration regarding their use of intervention strategies. Even more important, perhaps, was the attention to language goal selection and teaching.

As mentioned earlier, selection of appropriate learning goals is an extremely important and, for the interventionist at least, extremely challenging part of the intervention process. It is also highly individualized; every child presents with a different communication profile and a different set of language needs. The task is one for which we might expect parents to require considerable guidance and support.

Because the group format did not easily lend itself to the type of personalised attention many families needed in this area, goal selection and teaching became a major focus during home visits. Parents received advice and feedback regarding the identification and facilitation of appropriate language targets. Child progress was carefully monitored and treatment modifications suggested as necessary. Parents were also assisted in the development of learning activities and games, designed to facilitate their child's specific target skills, and based on their own particular household routines and activities.

An outline of topics covered in both group and individual sessions is provided
below:

1. **Group Program Outline**

**Group Session #1**

1. Normal Language Development  
   a. Nature of language learning  
   b. Developmental sequence  
2. Language Delay/Disorder  
   a. Nature of language delay  
   b. Possible causes

**Group Session #2**

1. Following your Child’s Lead  
   a. Encouraging initiations  
   b. Producing language at child’s level  
2. Turn-taking

**Group Session #3**

1. Responding to your Child  
   a. recognizing initiations  
   b. responding in a facilitative manner  
2. Helping your Child understand  
   Language

**Group Session #4**

1. Choosing What to Teach  
   a. Fit  
   b. Function  
2. How to Teach  
   a. Match interests and abilities  
   b. Focus your child’s attention  
   c. Make language useful

**Session #5**

1. Play  
   a. developmental sequence  
   b. choosing games and activities  
2. Music  
   a. choosing recordings  
   b. actions songs  
   c. adapting songs to daily activities  
3. Daily Activities  
   a. mealtime  
   b. bathtime  
   c. getting dressed  
   d. watching television
Group Session #6

1. Reading to your Child
   a. selection a book
   b. following child's lead
   c. paraphrasing at child's level
   d. reading style

2. Wrap-up and Review

Individualized Treatment Program Outline

Home Visit #1

1. Investigator models general language stimulation techniques (from Group Sessions #2 and 3), observes parent and child at play, and provides feedback.
2. Investigator and parents discuss ways of modifying home environment to encourage verbal initiations.
3. Investigator and parents discuss child's current level of language functioning, and determine realistic communication expectations for the child. Investigator introduces two potential goals, parent and investigator discuss methods for monitoring child's use of the skill over the next week.

Home Visit #2

2. Parents and investigator select language target(s) for the week.
3. Parents and investigator experiment with techniques and activities to encourage language target(s), decide on a home practice activities.

Home Visit #3

1. Investigator observes parent(s) interacting with child in goal-oriented activity, then provides feedback and demonstration where necessary.
2. Investigator reviews child's progress on selected goal(s), suggests modifications to goal, activity, and/or teaching methods where indicated.
3. Investigator and parent select play, music or daily activities to practice goal.
4. If appropriate, investigator introduces suggestions and activities to facilitate additional goal(s).

Home Visit #4

1. Video-tape #2: Facilitating specific language targets - Investigator video-tapes
parent-child interaction, reviews with parents. Feedback and modelling as needed.

2. Parents and investigator review child's progress regarding language goal(s), determine need for modifications.

3. Parents and investigator select additional goal(s) and activities.

Home Visits #5 and 6

1. Investigator observes pre-determined parent-child activity, provides feedback.
2. Parents and investigator continue reviewing child's progress on language goal(s).
3. Parents and investigator review use of language facilitation skills during daily activities.

IV SUMMARY AND CONCLUSION

At the beginning of this chapter, we established that the end-goal of this language intervention program was to facilitate positive change in the language abilities of the children involved. A more immediate goal was to empower parents as the facilitators of change. The program accomplished these goals in three ways.

First, by presenting and reviewing new information in a variety of ways, by providing opportunities for parents' active discovery of concepts and ideas, and by building upon their prior knowledge and experience, this program helped parents to acquire the basic knowledge necessary to function as language interventionists. It offered fundamental information on a range of topics, including: language acquisition and development, the nature of communicative behaviour, the nature of language impairment, and principles of language intervention.

Second, parents were furnished with the skills necessary to effect successful intervention. They were afforded opportunities to hone and develop their abilities, through practice activities in role plays and at home with their child, and in group problem-solving discussions. Ongoing feedback and suggestions received from a variety of sources
assisted in this process. As a result, parents learned to evaluate their child's abilities and progress, to encourage, recognize, and respond to child communication in a facilitative manner, and to select and target language goals during everyday activities.

Finally, the program undertook to instill in parents a positive attitude towards their role as interventionists, and to help motivate them to make effective and continued use of their knowledge and skills. By recognizing parents as active, capable, and responsible learners, by addressing their specific concerns, by encouraging them to provide feedback and suggestions to one another, and by helping to demonstrate the positive effects of their efforts, the program assisted in developing parents' confidence and independence.

So far, discussion of this intervention program has focused upon its final outcome. From its conception, the program described in this chapter was designed to effect eventual improvements in child language abilities. But establishing significant changes in children's language often takes time. Meanwhile, a more immediate, although secondary benefit to intervention must be considered. This concerned parents' ability, not only to change the problem, but to deal with the language difficulty as it already existed.

Raising a language-impaired child is seldom easy. Frequent communication breakdowns cause frustration for parents and children alike. In addition, parents of language delayed children often report feelings of helplessness, guilt, and isolation (Andrews & Andrews, 1987; Dockrell, 1989; Fey, 1986). The program addressed these issues in a number of ways. First, it provided information about language impairment and its implications. It was hoped that helping parents gain a better understanding of their
child's difficulties would lead to more realistic parental expectations, and help to reduce frustration and guilt. Second, it helped provide support and minimize feelings of isolation by establishing communication between families facing similar challenges and needs. Finally, it gave parents new strategies for talking to their children. Techniques used to facilitate language development (e.g., less directive interaction style, increased responsiveness to child communication) can often lead to healthier communication between parent and child long before there are measurable effects on child language skills.

There can be little doubt that these short-term benefits also contributed significantly to the achievement of long-term goals. Helping parents to manage the immediate and ongoing effects of their child's language delay further empowered them to act as effective interventionists.

I began this chapter by observing that in spite of their common goals, all language intervention programs are not the same. While the program I have described has certainly been influenced by other programs, and shares similar objectives, it is nevertheless unique. It cannot be seen as representative of parent-centred training in general.

This study seeks to examine the effects of a particular parent-centred language intervention program. In this chapter, I have attempted to familiarize the reader with the principles, goals, and special characteristics that define this intervention program. It is hoped that this background knowledge will assist in subsequent interpretation of the study and its results.
CHAPTER III
METHOD

I. OVERVIEW

The effects of two types of intervention programming on the language development of pre-school children was investigated. As outlined in the previous chapter, both treatment programs consisted of parent education that focused on developing a facilitative interaction style, and on selection and teaching of appropriate language goals. One of the programs additionally involved home visits by a speech-language pathologist who assisted in setting individual learning goals for the children as well as providing additional feedback and demonstration regarding use of intervention techniques.

Children were grouped into matched pairs by age, language level and cognitive ability. Members of each pair were randomly assigned to one of two treatment groups \((n=4\ each)\). Groups were as follows:

**Treatment Group I**

Phase 1: Parents attended a series of group meetings aimed at developing awareness of communicative development, identifying appropriate language goals, and modifying interactions with their child to facilitate language development. \((6\ weeks)\).

Phase 2: No-treatment period. \((7\ weeks)\).

**Treatment Group II**

Phase 1: Same as Program I.

Phase 2: Following completion of the group program, children and their parents were seen for five individual sessions with a speech-language pathologist. The focus of these visits was selection and on-going modification of specific language goals, assessment of progress, and monitoring use of facilitation techniques. \((7\ weeks)\).
Prior to, and following the three-month intervention period, each subject was video- and audio-taped during a play session with the investigator. These tapes were transcribed and subjected to linguistic analysis, in order to determine changes in the children's spontaneous expressive language over the 13-week interval. The relative efficacy and viability of the two approaches to parent training were examined within each matched pair, by comparing the language development of children in Group I to those in Group II.

II. SUBJECTS

8 preschool-aged children (two - four years) participated in this project. Potential subjects were recruited from a pool of children awaiting speech-language assessment and/or therapy services within the Vancouver Health Department. Although some of the children had undergone communication assessment prior to their involvement in the study, they had not received specific speech-language remediation, nor had their parents received any training in principles of language intervention. All had hearing within normal limits in at least one ear. Their parents had completed at least a secondary level education, and English was the dominant language in the home.

A. Subject Selection and Matching

Prior to inclusion in the study, children underwent a screening assessment of communication skills. Children were selected for participation according to the following
criteria:

1. **Productive Language Ability:** Only children demonstrating significant delays in language production were included in the study. All subjects performed more than 1.3 standard deviations below the mean on the Expressive portion of the *Reynell Developmental Language Scales* (1985). The reader will note that six of the eight children in the study actually performed well below the 10th percentile on this instrument.

2. **Cognitive Ability:** In order to exclude those children for whom cognitive delays might have precluded language development over the treatment period, subjects were required to meet one of two criteria:
   
a. Performance within two standard deviations from the mean on at least two tests of non-verbal cognitive ability. Subtests were selected from the *McCarthy Scales of Children's Abilities* (1972).
   
b. For the children unwilling to attempt the above subtests due to attentional/compliance difficulties, a secondary criterion was established. This stipulated performance at the 24-month level on 11 out of 12 items on a scale of non-verbal play behaviours (*Assessing Linguistic Behaviours: Play Scale*, Olswang, Stoel-Gammon, Coggins, & Carpenter, 1987).

During the initial assessment, subjects were evaluated along a number of linguistic parameters, including vocabulary size, language comprehension, length of utterance, and use of non-verbal communication strategies. The subjects were then grouped into matched pairs. Children were matched on the basis of age, cognitive ability, and the
results of language testing. One child from each pair was randomly assigned to Treatment Group I, the other to Treatment Group II.

Children demonstrating severe phonological difficulties were excluded from participation due to the difficulties such children present in assessing language production. While the possible effects of parent-centred intervention on phonological development is an interesting topic, it was not within the scope of this study.

B. **Subject Characteristics**

A summary of pre-test characteristics for each subject, and the pairs into which they were grouped, can be found in Tables 3.1 and 3.2. For convenience, the information has been divided into two sets. Subjects described in Table 3.1, (DO, MR, PC, and MH) were at an earlier stage of language learning in comparison with the other children in the study. Their communication skills were mainly characterized by productive vocabularies of 50 words or less, few word-combinations, and a reliance on non-verbal communicative behaviours (40% or less of each child's communicative attempts were verbal). The children presented in Table 3.2 (WB, JH, JB, and JW) were more linguistically advanced than the first group, demonstrating vocabularies in excess of 90 words, and producing a wide variety of one- and two-word utterances. The reader will note that on balance, children in Treatment Group II (individualized component) were slightly more delayed than the Group I children.
### Table 3.1 Pre-Test Characteristics for Subject-Pairs 1 - 2.

<table>
<thead>
<tr>
<th>Pair</th>
<th>Child</th>
<th>CA</th>
<th>Sex</th>
<th>Expressive Vocabulary (MacArthur)</th>
<th>Expressive Vocabulary (Reynell Developmental Language Scales (Standard Scores))</th>
<th>Verbal/Gestural Communicative Attempts</th>
<th>Play Behaviours (ALB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DO 3;2</td>
<td>M</td>
<td>15 words</td>
<td>-</td>
<td>3.0</td>
<td>17</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>MR 2;8</td>
<td>F</td>
<td>14 words</td>
<td>-</td>
<td>3.0</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>PC 2;9</td>
<td>M</td>
<td>50 words</td>
<td>-1.1</td>
<td>3.0</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>MH 2;1</td>
<td>M</td>
<td>22 words</td>
<td>-0.1</td>
<td>1.6</td>
<td>16</td>
<td>84</td>
</tr>
</tbody>
</table>

1. MacArthur Communicative Development Inventory (1989)

### Table 3.2 Pre-Test Characteristics for Subject-Pairs 3 - 4.

<table>
<thead>
<tr>
<th>Pair</th>
<th>Child</th>
<th>CA</th>
<th>Sex</th>
<th>Type-token ratio (TTR)</th>
<th>Reynolds Developmental Language Scales (Standard Scores)</th>
<th>MLU (morphemes)</th>
<th>IPSyn 4 Score</th>
<th># McCarthy 5 subtests passed</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>WB 2;9</td>
<td>F</td>
<td>0.31</td>
<td>+ 0.2</td>
<td>- 1.6</td>
<td>-2.45</td>
<td>-3.40</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>JH 3;0</td>
<td>M</td>
<td>0.53</td>
<td>-0.4</td>
<td>-1.3</td>
<td>-2.35</td>
<td>-2.62</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>JB 3;3</td>
<td>M</td>
<td>0.43</td>
<td>+0.6</td>
<td>-2.0</td>
<td>-2.17</td>
<td>-2.00</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>JW 3;1</td>
<td>M</td>
<td>0.54</td>
<td>+0.4</td>
<td>-1.3</td>
<td>-1.93</td>
<td>-1.70</td>
<td>2</td>
</tr>
</tbody>
</table>

3. Miller, 1981
4. Index of Productive Syntax (Scarborough, 1990)
5. McCarthy Scales of Children's Ability (1972)
III. ASSESSMENT AND ANALYSIS PROCEDURES

A. Initial Assessment

The purpose of initial assessment was three-fold: to determine eligibility for participation in the study, to provide a baseline against which future progress could be measured, and to assist in selection of appropriate treatment goals. Families participated in two-three initial data collection sessions, each lasting approximately one hour. Sessions were conducted for the most part at Vancouver Health Department offices, although for convenience, two sessions occurred in families' homes.

Initial assessment consisted of a video- and audio-taped language sample, and a small battery of standardized tests administered by the examiner. Parents also completed a vocabulary inventory and attitudinal survey, and participated in a case history interview. A brief description of these procedures follows.

1. Data Collected from Parents

Because of the study's interest and focus on parent participation in treatment, it make sense that parents be actively involved in the assessment process. All parents took part in a pre-assessment interview, during which they provided case-history information about their child, and were encouraged to express their perceptions of the language difficulty, as well as their concerns and priorities regarding intervention. This interview was supplemented by information obtained through the Parent as a Teacher Inventory (PAAT) (Strom & Slaughter, 1976). The PAAT is a composite attitude scale in which
parents are asked to describe feelings about various aspects of the parent-child interactive system, including attitudes towards teaching their children. This scale was used to help determine the family's specific needs and abilities when designing treatment procedures and goals.

To assess productive vocabulary, those parents who reported that their child had fewer than 50 words in his/her expressive repertoire were asked to complete the MacArthur Communicative Development Inventory - Toddler Form (1989). This instrument consists of a set of checklists and interview questions regarding children's use of familiar words, and was used as an estimate of vocabulary size and diversity for five of the children in the study. Children whose productive lexicon was judged to be well beyond 50 words (based on parent report, as well as other measures of linguistic performance) were not formally assessed with regards to lexical acquisition.

2. Cognitive Screening

Portions of the McCarthy Scales of Children's Abilities (1972) were used with four of the children as a screening instrument for non-verbal cognitive skills. The McCarthy consists of 18 different subtests, and examines a variety of cognitive and motor abilities. The three subtests administered in this study were selected from the Perceptual-Performance Scale. These included: Block Building, Tapping Sequence, and Draw-A-Design. Results were interpreted in terms of standard deviation from the mean. Because this was intended as a screening measure only, subjects were scored on a Pass/Fail basis. The criterion for a Pass was performance within two standard deviations of the
mean on at least two of the three subtests administered.

Due to compliance and attentional difficulties, some of the children assessed for the study were not testable using the McCarthy subtests. For these children, an estimate of non-verbal cognitive function was obtained through observation of play skills. The procedure was that developed by Olswang et al. (1987) in Assessing Linguistic Behaviours (ALB): Play Scale. Each child was observed at play with an adult, using four different sets of toys, or 'play scenes'. (These included a tea party, nurturing, transportation, and farm scene.) Instances of various 'play episodes' were tallied on a checklist of non-verbal play behaviours. 12 different play behaviours were examined; these ranged from single play episodes (e.g., banging or nesting objects), to multiple thematic episodes (e.g., kissing a doll, putting her in the crib, then covering her with a blanket). The ALB provides normative data for children up to the age of 24 months. As with the McCarthy subtests, for purposes of this study, children were scored on a Pass/Fail basis. To pass, children were required to perform at the 24-month level on at least 11 of the 12 items included on the scale.

3. Communication Assessment

a. Standardized Testing

Initial assessment included the use of one norm-referenced language measure. The Reynell Developmental Language Scales (1985) tests children's language comprehension and production, using a variety of familiar household objects and toys. Comprehension tasks include: comprehension of familiar object names, following simple
directions, and relating concepts. The expressive scale includes: labelling of pictures and objects, picture description, and language production during spontaneous interaction with an adult. Results of the Reynell were expressed as standard scores.

b. Communication Sample

The principal language assessment tool used in this study was an hour-long communication sample collected during a play interaction between the child and the investigator. All language samples took place in the clinic, using toys provided by the examiner, and were video and audio-taped using the following high-quality recording equipment:

(a) Marantz PMD430 audiorecorder
(b) Realistic PMZ 33-1090B microphone
(c) Panasonic AG-190-K videorecorder

Communication samples were collected in two spacious, carpeted therapy rooms located in Health Unit offices of the Vancouver Health Department. Parents generally remained in the room during testing; however, they were seated well away from the play area, and rarely participated in play activities.

Because of the range of language abilities demonstrated by the subjects, the study made use of two different sets of procedures and materials to elicit communication. The specific procedures chosen to assess a given child depended on his/her general language level.

(1) Subject-Pairs 1 and 2 - Elicitation Procedures

Following initial screening, it was apparent that four children, MR, DO, MH, and
PC, were functioning at an early, largely pre-verbal stage of communicative development. Procedures used to elicit communicative behaviours with these children were adopted from those described in *Assessing Linguistic Behaviours (ALB)* (Olswang et al., 1987). Five sets of materials were used: the four play scenes described in the Play Scale of the ALB (i.e., Tea party, Farm, Nurturing, and Transportation), along with a set of stimulus items designed to encourage child-initiated comments and requests for assistance. These additional items included the following: two wind-up toys, a balloon, a jar of bubbles, and 2-3 small toys inside a tightly closed glass bottle. During assessment, the examiner maintained a non-directive interaction style intended to encourage child-initiated communicative attempts and play behaviours. Parents were instructed to assume a similar manner when approached by their child. These procedures provided a means for observing children's communicative attempts during interaction with an adult (primarily the investigator) in a low-structured play situation.

(2) **Subject-Pairs 1 and 2 - Analysis Procedures**

Video-taped play samples were analyzed to identify the occurrence of intentional communicative behaviours. The Communicative Intention Scale of the ALB was used to classify these behaviours as:

1. Either verbal or gestural-vocal
2. Belonging to one of six categories of communicative intent:

   - Commenting
   - Requesting an action or object
   - Requesting information
   - Acknowledging a previous turn
Answering
Other (e.g., refusal)

For each child, the distribution of communicative behaviours among these categories was expressed in percentage of total communicative attempts.²

(3) Subject-Pairs 3 and 4 - Elicitation Procedures

The remaining, more linguistically advanced children, JH, WB, JW, and JB, were assessed using a slightly different set of materials and procedures. For each child, the examiner collected a 300- to 400-utterance language sample during interactions of approximately one-hour duration. Three activities were used to elicit conversation:

- unstructured play involving a Fisher-Price Farm set,

- removing and examining several familiar and less familiar toys and household objects (including two - three broken toys) from a large bag, and

- a drawing activity using scented markers.

As with the first group, the primary role of the examiner during these activities was to elicit conversational language from the child in a non-directive manner. In addition, however, several other strategies were utilized. These included: creating a need for objects not present (e.g., asking child to draw a picture before providing necessary materials), introducing unexpected events and inappropriate requests (e.g., broken toys, donning a funny mask mid-way through the interaction, asking the child to sit down while already sitting), encouraging narration of a past or on-going event, and inviting description of a person or object not in the room. These strategies were employed because of their

² Scoring and analysis procedures were based on those recommended in Assessing Linguistic Behaviours: Communicative Intention Scale (Olswang, Stoel-Gammon, Coggins, & Carpenter, 1987).
potential for eliciting a wide variety of language forms, including complex and compound sentence types, as well as syntactic and morphological structures such as copula and auxiliary ‘be’, modifiers, past tense markers, and negative forms (Lund & Duchan, 1988; Miller, 1981). Each child was also asked one of each of the following question types:

- Yes/No (e.g. ‘Is that a cow?’)
- What - labelling (e.g. ‘What’s this?’)
- What - function (e.g. ‘What do you hear with?’)
- Who...?
- Where...?
- Why...?
- When...?
- How...?

(4) Subject-Pairs 3 and 4 - Analysis Procedures

Language samples were transcribed in their entirety from video-taped recordings, supplemented where necessary by audio-recordings. So that some of the analyses could be performed by computer, samples were transcribed and entered in SALT (Systematic Analysis of Language Transcripts) (1985) format. Linguistic analysis of transcripts focused on three main areas: semantics (lexical and relational), inflectional morphology, and syntax.

(a) Semantics Type-Token Ratio (Templin, 1957) was calculated for each sample and used as a gross estimate of lexical semantic skills. TTR is obtained by dividing the number of different words produced in a 50-utterance sample, by the total number of words produced overall.

Semantic Relations were coded for all two-or-more-word utterances produced by the child. The reader will note that within this system, a given utterance may express more than one relation. The nine relational categories selected for analysis were adapted
from the ALB (Olswang et al., 1987), and included the following: Demonstratives, Negatives, Activity (agent + action), Causality (action + object), Physical States, Recurrence, Possessives, Statives (i.e., internal or transitory states, e.g., 'I know', 'That all gone'), and Locatives. For each child, percentage of occurrence for each relational category was calculated by dividing the number of utterances within each category by the total number of semantic relations expressed.³

(b) Syntax and Morphology Mean Length of Utterance (MLU) in morphemes (Brown, 1973) was used as a general measure of morpho-syntactic complexity. MLU was also expressed as a standard score (Miller, 1981). Also selected as a gross indication of language structure level was the IPSyn, or Index of Productive Syntax (Scarborough, 1990).

The IPSyn is an efficient, reliable, and age-sensitive measure of grammatical complexity designed for use in experimental analysis of preschool language samples (children aged two - four). It was developed on corpora collected longitudinally from 15 children from American middle-class families. The scale was originally modelled after Assigning Structural Stage (Miller, 1981), and investigates production of 56 grammatical items common in early language development. In computing the IPSyn, up to two occurrences of each grammatical form are tallied within a 100 - utterance corpus. Findings yield a Total Score, as well as subscores for Noun Phrases, Verb Phrases, Questions/Negations, and Sentence Structures. Performance is rated in comparison to

³ Scoring and analysis procedures were based on those prescribed in Assessing Linguistic Behaviours: Language Production Scales, (Olswang, Stoel-Gammon, Coggins, & Carpenter, 1987), and in Assessing Language Production in Children, (Miller, J., 1981).
age-peers, and scores are expressed in terms of Standard Deviation from the mean. The IPSyn has been found to be strongly correlated with MLU, and sensitive to persistent differences between normal and language-delayed preschoolers (Rescorla & Schwartz, 1989; Scarborough & Dobrich, 1985).

Once an overall level of structural complexity had been established for each child, more indepth analysis involving specific morphological and syntactic forms was performed. In each case, specific forms and sentence patterns that were at or slightly above the child's developmental level were selected for analysis. The child's use of these forms was evaluated according to:

i) number of occurrences in the language sample

ii) number of 'attempts' and/or omissions in an 'obligatory context'.

Operational definitions for the term 'attempt' varied according to the specific form or structure under study. In general, any instance in which a form was clearly marked or intended by the child, but in an idiosyncratic or incorrect way, was considered an attempt at that form. For example, for the sentence pattern 'subject + verb + object', the utterance, 'Me that.' (produced as child throws a ball) would be considered an attempt. For the same pattern, the utterance, 'I make.' (in response to the examiner's 'Who made that?') would not be seen as an attempt. In this case, omission of the sentence object would be regarded as an acceptable elliptical response.

---

4 Procedures used in the analysis of morpho-syntactic production were developed in part from those described in Assessing Language Production in Children, (Miller, 1981), and in Assessing Children's Language in Natural Contexts, (Lund, N. & Duchan, J., 1988). Johnston & Ammon's Order of acquisition for selected linguistic forms, (1978) (cited in Kamhi, A. & Nelson, L., 1988), was also used frequently as a resource.
IV. INTERVENTION PROCEDURES

A. Identifying Language Targets

On the basis of initial assessment results, two - five specific language areas and structures were identified as potential intervention targets for each child. For the children in Group II, these skills and structures became the learning goals eventually focused on during individual home visits. For Group I, these forms were targeted for pre- vs. post-test comparison, but were not suggested to the parents as potential goals, or incorporated in any way into the intervention process.

The following criteria served as guidelines for selection of target skills:

(a) Child's performance in a given skill area was commensurate or depressed relative to his/her overall language level

(b) Specific forms or structures targeted within a skill area were at or slightly above the child's current level of functioning

(c) Child demonstrated interest in target skill(s) non-verbally and/or attempted to communicate structure(s) or concept(s) using alternative language forms

(d) Family expressed concern about or was eager to target a specific area or structure

(e) The set of goals selected for a single child represented more than one general language area, i.e., Semantics, Communicative Attempts and Intentions, Inflectional Morphology, and Syntax.
Members of matched pairs rarely shared precisely the same set of communication goals. Language target selection was regarded as a highly individualized process, since it was based on the specific needs and abilities of each child. Nevertheless, language targets for subjects within pairs were considered comparable, in as much as the skills and structures chosen were consistently those for which progress was felt most likely to occur. Across all subjects, the same procedures and criteria were generally used to make selection decisions for each subject.

Two targets chosen for JB and WB failed to meet these criteria listed above. Both instances involved selection of language targets that the children had neither attempted nor produced at pre-test. In each case, the target was chosen as part of a larger or more general goal. For example, verb phrase expansion was considered a priority for JB. Because of his extreme weakness in the area of inflectional morphology, production of catenatives was targeted as a non-inflectional means of extending the verb phrase. For WB, who produced no morphological markers at pre-test, the progressive ‘-ing’ morpheme was chosen in an effort to establish some early use of inflectional morphology. This particular form was selected because it could be easily targeted in activities used to facilitate WB’s expression of Causal relations (a second intervention target).

Table 3.3 provides a summary of the target structures identified for each child.
Table 3.3  Language Areas Targeted for Potential Progress

<table>
<thead>
<tr>
<th>Pair</th>
<th>Treatment</th>
<th>Child</th>
<th>Identified Language Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group</td>
<td></td>
<td>Semantics</td>
</tr>
<tr>
<td>1</td>
<td>I</td>
<td>DO</td>
<td>expressive vocabulary size</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>I</td>
<td>PC</td>
<td>expressive vocabulary size</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>MR</td>
<td>expressive vocabulary size</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>MH</td>
<td>expressive vocabulary size</td>
</tr>
<tr>
<td>3</td>
<td>I</td>
<td>WB</td>
<td>expressive vocabulary size</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>JH</td>
<td>semantic relation: statives</td>
</tr>
<tr>
<td>4</td>
<td>I</td>
<td>JB</td>
<td>semantic relation: causality</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>JW</td>
<td>semantic relation: statives</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* identified as language targets mid-way through intervention program
B. Intervention Programs

Intervention began following the initial assessment, and proceeded for a period of approximately 13 weeks. It consisted of two phases:

1. Group Program: Families in both Treatment Groups I and II attended a series of weekly group meetings (approximately two hours each) for a period of six weeks. These sessions were conducted by the investigator, and focused on developing parents’ awareness and abilities as child language facilitators.

   Each group consisted of five to eight families. While both parents in each family were encouraged to attend, this was not feasible in most cases. Approximately half the families enrolled in the group parent program were parents whose children had not been accepted as subjects in the study, but who were nevertheless interested in learning to help their child acquire language.

   A complete description of program content, as well as the procedures used in intervention has been provided in Chapter II.

   Completion of the group program marked the end of treatment for families in Treatment Group I. Parents were advised to continue using language facilitation techniques with their child during the seven week period until follow-up assessment. Families in Treatment Group II went on to the second phase of intervention.

2. Individual Parent Sessions: Immediately following completion of the group training program, Group II families were seen by the examiner for a series of weekly or bi-weekly home visits. Each family was visited five times over a seven-week period. Home sessions were used to supplement material presented in the group program, and
to provide support and guidance for parents. Treatment during this phase emphasized selection of appropriate language goals for children, as well as developing language-based activities for use in the home.

V. PROGRAM EVALUATION PROCEDURES

A. Design

The importance of individualized goal-selection and assistance on the overall effectiveness of parent intervention training was determined by comparing the effects of a program which provides group instruction alone (Treatment Group I), to one which provides additional instruction and support at a more personalized level (Treatment Group II). Within matched pairs, children in Groups I and II were compared with regards to pre- and post-intervention differences in dependent variable measures.

B. Follow-up Assessment

13 to 15 weeks after the initial assessment, children were seen for a follow-up evaluation of language skills. Once again, subjects were video- and audio-taped as they engaged in play activities with the investigator. Sessions lasted approximately one hour, with elicitation procedures and materials identical to those employed during the initial assessment. Parents who had filled out the MacArthur Communicative Development Inventory: Toddler Form (1989) as part of the previous evaluation were asked to do so again.
Communication samples were transcribed and submitted to extensive linguistic analysis by the investigator, using the procedures and techniques described previously. The purpose of follow-up assessment was to observe and measure any changes in child language skills that had occurred over the intervention period.

C. **Dependent Variables**

Because spontaneous language sample measures are considered a more sensitive gauge of language development than standardized test results (Nye, Foster and Seaman, 1987), dependent variables were derived primarily from data collected during pre- and post-test communication samples.

Dependent variables were selected for each subject; these included **specific** language behaviours (i.e., those language areas initially targeted as potential treatment goals), as well as more **general** indices of language performance (e.g., IPSyn, MLU, etc.). Differences in pre- and post-test performance on each dependent variable were compared within subject pairs.

A list of dependent variables for each pair is provided in Tables 3.4 and 3.5.
<table>
<thead>
<tr>
<th>Pair</th>
<th>Skill Area</th>
<th>Dependent Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (DO &amp; MR)</td>
<td>Communicative Behaviours</td>
<td>Total # of communicative behaviours produced during communication sample</td>
</tr>
<tr>
<td>2 (PC &amp; MH)</td>
<td>Communicative Behaviours</td>
<td>Total # of communicative behaviours produced during communication sample</td>
</tr>
<tr>
<td></td>
<td>Sentence Length</td>
<td>% of multi-word utterances</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(# of multi-word utterances) / (total # utterances)</td>
</tr>
<tr>
<td>3 (JB &amp; JW)</td>
<td>General Language Production</td>
<td>Language Stage Assignment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Johnston, Ammon, &amp; Kamhi, 1988)</td>
</tr>
<tr>
<td></td>
<td>Morpho-Syntactic Ability</td>
<td>1. Index of Productive Syntax - raw score</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( Scarorough, 1989)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Mean Length of Utterance</td>
</tr>
<tr>
<td>4 (WB &amp; JH)</td>
<td>General Language Production</td>
<td>Language Stage Assignment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Johnston, Ammon, &amp; Kamhi, 1988)</td>
</tr>
<tr>
<td></td>
<td>Morpho-Syntactic Ability</td>
<td>1. Index of Productive Syntax - raw score</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( Scarorough, 1989)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Mean Length of Utterance</td>
</tr>
<tr>
<td>Pair</td>
<td>Skill Area</td>
<td>Dependent Variables</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 1 (DO & MR)| Verbal Communication| 1. % of communication attempts that were verbal  
(# Verbal attempts/ Total # attempts) x 100  
Productive Lexicon 2. MacArthur CDI - raw score  
Communicative Intents 3. DO % of adult questions asked to which child responded  
MR % of child initiations that were comments |
| 2 (PC & MH)| Verbal Communication| 1. % of verbal communication attempts (as for Pair 1)  
Productive Lexicon 2. MacArthur CDI - raw score  
Relational Semantics 3. Total # of relational categories expressed |
| 3 (JB & JW)| Relational Semantics| 1. JB % of Semantic Relations expressing Causality  
(# Causal Relationships/ Total # of Semantic Relations) x 100  
JW % of Semantic Relations expressing Statives  
(# Statives/ Total # of Semantic Relations) x 100  
Inflectional Morphology 2. JB % production of ' - ing ' in obligatory context  
JW % production of reg. past ' -ed ' in obligatory context  
3. JB % production of copula -'s in obligatory context  
JW % production of 3rd person sing. ' -s ' in obligatory context  
Syntax 4. (# occurrences '{N +} Caten. + Verb + Noun '/' # attempts) x 100  
5. JB (# occurrences of '{ S + V + Obj. '/' # attempts) x 100  
JW (# occurrences of '{ N + 'not/no' + V '/' # attempts) x 100( |
| 4 (WB & JH)| Relational Semantics| 1. WB % of Semantic Relations expressing Causality  
(# Causal Relationships/ Total # of Semantic Relations) x 100  
JH % of Semantic Relations expressing Statives  
(# Statives/ Total # of Semantic Relations) x 100  
Inflectional Morphology 2. % production of ' - ing ' in obligatory context  
Syntax 3. WB (# occurrences of '{ V + Obj. '/' # attempts) x 100  
JH (# occurrences of '{ S + V + Obj. '/' # attempts) x 100  
4. WB (# occurrences of '{S + V + Obj. '/' # attempts) x 100  
JH (# occurrences of '{N +} caten. + V + N '/' # attempts) x 100 |
CHAPTER IV
RESULTS

The purpose of this study was to determine the impact, if any, of individualized support and attention on the effectiveness of parent-centred language intervention. To answer this question, the families of 8 language-delayed children were enrolled in two treatment programs, one which included an individualized component (Group II), and one which did not (Group I). Program efficacy was measured in terms of the progress shown by the children on language variables measured in pre- and post-test assessments. To compare the relative effects of the two treatment approaches, the progress demonstrated by children in Treatment Group I was compared to that shown by children in Group II.

Due to the small number of subjects, and heterogeneity within groups, comparisons between Treatment Group I and II children was most easily accomplished within matched subject-pairs.

I. PAIR #1 - DO and MR

A. Group II child (individualized component) - DO

1. General Description

DO, aged 3;2 at initial assessment, presented with severe communication deficits. Although initially somewhat difficult to engage in interaction, he did make frequent efforts to communicate, primarily using gesture (e.g., pointing, facial expression, etc.) and physical manipulation (e.g., placing the examiner's hand on a lid he wished open). These
behaviours were supplemented by babbling and occasional one-word utterances.

While DO was able to effectively initiate and maintain his own communicative topics using these means, he was relatively unresponsive to the initiations of others. It was extremely difficult to direct his attention, and he consistently failed to respond to adult-initiated directions and questions. For this reason, it was not possible to obtain a formal assessment of DO's comprehension ability.

Communication areas targeted during intervention included: verbal vs. gestural-vocal production, vocabulary size, and communicative intentionality.

2. Initial Assessment (Pre-test) Results

a. Verbal Communication

DO produced a total of 68 communicative behaviours during a 1-hour play interaction. 82.3% of these (56 instances) were non-verbal. The remaining 12 instances (17.7%) were single-word utterances; 7 spontaneous, 5 imitated. DO produced a total of 4 different words over the course of the interaction: 'ohoh', 'cow', 'bubble', and 'whoops'.

b. Lexical Semantics

Lexical acquisition was extremely delayed, as indicated by DO's performance on the MacArthur Communicative Development Inventory (CDI) - Toddler Form, (1989), an instrument used to estimate productive vocabulary size. DO received a raw score of 15 words, which placed him far below the 10th percentile for his age.

c. Communicative Intent

Child Initiations: 85% of the communicative behaviours demonstrated by DO were
These initiations were equally divided between comments (50%), and requests for objects and actions (50%).

**Child Responses**: In comparison, responses to adult initiations were quite rare - only 15% of the communicative acts performed by DO were responses. DO used words and gestures on 10 separate occasions to acknowledge or imitate the investigator’s preceding communicative attempts.

7 of these 10 instances involved continuation of a topic introduced previously by the child (e.g., The child is involved with a toy cow, the examiner labels the item, the child then imitates, ‘cow’). In the remaining 3 instances, DO imitated exclamations (‘ohoh’ and ‘whoops’) produced by the examiner to comment on unexpected or amusing events.

That there should be fewer child responses than initiations is perhaps not surprising, since the test-situation was purposely designed to provide as unstructured and non-directive an environment as possible i.e., to encourage child initiations. For this reason, it was important to observe DO’s communicative behaviour during instances in which a response was clearly obliged, i.e. following questions produced by the investigator. DO failed to respond to any of the 15 questions directed towards him during the initial assessment.

3. **Post-test Results**

a. **Verbal Communication**

DO, who was noticeably more interactive and communicative by the end of the 3-month treatment interval, demonstrated marked progress in the area of verbal (as
<table>
<thead>
<tr>
<th>Language Area</th>
<th>Dependent Variables</th>
<th>Pre-test Performance</th>
<th>Post-test Performance</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>General:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicative Behaviours</td>
<td>total # produced during communication sample</td>
<td>68</td>
<td>169</td>
<td>246% increase</td>
</tr>
<tr>
<td>Specific:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal Communication</td>
<td>% verbal communicative behaviours (# verbal attempts)</td>
<td>17.7% (12/68)</td>
<td>43% (80/169)</td>
<td>+ 25.3%</td>
</tr>
<tr>
<td>Lexical Semantics</td>
<td>MacArthur CDI - raw score</td>
<td>15 words produced</td>
<td>147 words produced</td>
<td>+ 132 words</td>
</tr>
<tr>
<td>Communicative Intents</td>
<td>% questions responses in obligatory context (# question responses)</td>
<td>0% (0/15)</td>
<td>23.5% (4/17)</td>
<td>+ 23.5%</td>
</tr>
</tbody>
</table>
opposed to gestural-vocal) communication strategies. DO produced a total of 169 communicative acts at follow-up, almost 3 times the number produced during a previous sample of equal length. 80 of these were instances of verbal communicative behaviours, as compared to 15 such instances observed during the initial assessment. 43% of DO's communicative attempts were now verbal, an increase of 29.6% since pre-test.

64 of the 80 utterances produced by DO were single words; 16 were 2-word combinations. It was questionable whether these early combinations were as yet fully analyzed by DO. Routine phrases such as 'my turn', 'sit down', 'put in', etc. accounted for most of the combinations observed (14 out of 16). Nevertheless, two examples of true multi-word productions were noted; these were 'close box' and 'lid on'.

DO continued to rely heavily on non-verbal strategies as part of his communicative repertoire. 89 of the 169 communicative behaviours exhibited at follow-up were non-verbal (52.7%). While many of these strategies were identical to those produced at pre-test (i.e., gestures, facial expression, etc.), DO also demonstrated a marked increase in the amount of babbling produced. Approximately 38 of his non-verbal communication behaviours (34%) were variegated babbling sequences with sentence-like intonation patterns.

b. **Lexical Semantics**

Vocabulary development was the language area that showed greatest progress over the treatment interval. DO's expressive lexicon (as measured by the MacArthur CDI) increased from 15 words at pre-test to 147 at final assessment, a 10-fold increase in only 3 months. Although DO's expressive vocabulary size remained well below age-level
expectations, his performance relative to children functioning at a similar stage of language development (i.e., fewer than 20 words produced at pre-test) was extremely impressive. For such children, studies of normal language acquisition predict an average vocabulary acquisition rate of between 9 and 11 new words per month (Benedict, 1979; Nelson, 1973). DO produced, on average, 44 new words per month. His performance was clearly exceptional.

c. **Communicative Intent**

**Non-communicative Productions:** A large number (46 occurrences) of DO’s productions at post-test were immediate repetitions of words and phrases produced by the investigator. While the majority of these (76%) were used functionally (e.g., to comment on an item or activity, or to acknowledge a speaker’s previous utterance; Prizant and Duchan, 1981), others appeared to serve little communicative purpose. In addition, DO frequently engaged in extended episodes of babbling and vocal play. These also seemed to have little functional value. Such behaviours were judged to be non-communicative, and thus were not included in the analysis of communicative intent.

**Child Initiations:** As at pre-test, the majority of DO’s communicative behaviours were initiations (150 out of 169 instances, or 89.4%). These, once again, were fairly equally divided between comments and requests. In addition, DO used language 8 times to initiate familiar social routines (e.g., saying ‘nightnight’ after putting a doll to bed, producing ‘hello’ while talking into a toy telephone, etc.).

**Child Responses:** DO provided answers to 4 out of 17 questions directed towards him during post-assessment (23.5% use in obligatory context).
4. **Summary of Progress**

Despite the severity of his communication impairment, DO demonstrated excellent gains over the 3-month intervention period. This growth was evident in each of the 3 language areas focused on during treatment. Most striking was DO's improvement in the area of productive vocabulary. He also demonstrated a marked increase in his use of verbal communication strategies, and in his willingness to respond to the communicative initiations of others.

B. Group I child (no individualized treatment) - MR

1. **General description**

MR was aged 2;8 at initial assessment. Like DO, she was somewhat aloof and hesitant to engage in social activities. MR was essentially non-verbal at pre-test, communicating using gesture (e.g., pointing, blowing to request that an adult blow up a balloon) and physical manipulation (e.g., placing a balloon in the examiner's mouth). Her occasional vocalizations consisted primarily of laughter, squealing, and babbling. She showed a lack of persistence in her communicative initiations, i.e., if she did not receive an immediate response, she was unlikely to make a second attempt. MR was reluctant to make eye contact or to acknowledge the communicative attempts of others. Her own communicative behaviours were used predominately to request objects or actions from an adult.

A formal evaluation of language comprehension skills could not be completed.

2. **Initial Assessment (pre-test) Results**
a. **Verbal Communication**

As stated above, MR was completely non-verbal during her initial assessment. She demonstrated a total of 87 gestural-vocal communicative productions during the 1-hour assessment period.

b. **Lexical Semantics**

MR's performance on the MacArthur CDI indicated an expressive vocabulary of approximately 14 words.

c. **Communicative Intent**

**Child Initiations:** Of the 82 communicative initiations produced by MR during an hour-long play session, 74 (90%) were used to request an action or object from an adult. Only 8 (10% of total initiations) were used to make comments or to direct a listener's attention to specific items of interest.

**Child Responses:** MR produced 7 communicative behaviours that acknowledged or confirmed an immediately preceding utterance produced by the investigator. 6 of these were affirmative head-nods produced in response to requests for action. A 7th instance involved vigorous head-shaking in response to the examiner's suggestion that a favourite toy be put away.

MR failed to answer any of the 19 questions directed towards her during the initial assessment.

2. **Post-test Results**

a. **Verbal Communication**

MR produced a total of 94 communicative behaviours during follow-up assessment.
Table 4.2  Pre- vs. Post-test Performance on Dependent Variables: MR (Treatment Group I)

<table>
<thead>
<tr>
<th>Language Area</th>
<th>Dependent Variables</th>
<th>Pre-test Performance</th>
<th>Post-test Performance</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>total # produced during communication sample</td>
<td>87</td>
<td>94</td>
<td>108% increase</td>
</tr>
<tr>
<td>General:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicative</td>
<td>total # produced during communication sample</td>
<td>87</td>
<td>94</td>
<td>108% increase</td>
</tr>
<tr>
<td>Behaviours</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal Communication</td>
<td>% verbal communicative behaviours</td>
<td>0%</td>
<td>18%</td>
<td>+ 18%</td>
</tr>
<tr>
<td></td>
<td>(# verbal attempts)</td>
<td>(0/87)</td>
<td>(17/94)</td>
<td></td>
</tr>
<tr>
<td>Lexical Semantics</td>
<td>MacArthur CDI - raw score</td>
<td>14 words produced</td>
<td>20 words produced</td>
<td>+ 6 words</td>
</tr>
<tr>
<td>Communicative</td>
<td>% initiations that were comments</td>
<td>10%</td>
<td>42%</td>
<td>+ 32%</td>
</tr>
<tr>
<td>Intents</td>
<td>(# comments)</td>
<td>(8/80)</td>
<td>(31/74)</td>
<td></td>
</tr>
</tbody>
</table>
Although these consisted primarily of non-verbal behaviours (i.e., gestures, vocalizations, and physical manipulation), approximately 18% (17 instances) of her communication attempts were now verbal (up from 0% at pre-test). MR produced 9 different single-word utterances. 7 were produced spontaneously, the remaining 10 were imitated following production by the clinician.

b. **Lexical Semantics**

Productive vocabulary showed little growth over the 3-month interval. Vocabulary size was estimated at about 20 words at post-test, using the *MacArthur CDI* (Performance at pre-test was 14 words).

c. **Communicative Intent**

MR's most encouraging gains were seen in the area of communicative intentionality. These gains seemed to reflect a general improvement in social-awareness and functional communication ability. Overall, MR presented as much more interactive and responsive during follow-up than she had previously. For example, she demonstrated more consistent eye contact, and repeatedly indicated her willingness to share in activities by sitting near or facing the examiner. These observations were further supported by the data:

**Child Initiations**: 74 of the 94 communicative behaviours produced by MR at post-test were used to initiate a topic or interaction. Of these, 31 (42% of total initiations) were used to comment on events or objects in the environment. In comparison with MR's pre-test performance (only 10% of her initiations were comments), this signifies a gain of 32 percentage points.
Child Responses: 19 communicative acts were produced in response to preceding adult statements (compared to 7 produced at pre-test in a sample of similar size). In each case, a response was obliged within the communicative context. 4 instances involved head nodding, which MR used to indicate agreement/compliance in response to an adult request. The remaining 15 involved imitation of gestures and words produced by the adult, in order to confirm/deny a direction or contingent query (e.g., Following several non-verbal requests by MR to open a jar, the examiner asked ‘Open?’. MR looked at the adult, nodded, and repeated the word ‘open’).

MR answered 1 out of 19 questions asked by her mother and the examiner during post-test evaluation (5% use in obligatory context).

4. Summary of Progress

Definite gains were noted in pre- vs. post-test communicative ability. Despite continued deficits, MR showed excellent improvement in social-interaction skills. These gains were reflected in her increased use of verbal communication strategies, and in her expanded range of communicative intents and purposes.

C. DO and MR: Comparison of Progress

As is clear from the results previously described, both Pair #1 children made significant gains in language development over the treatment interval. Since the purpose of this study was to compare the progress of Group I to Group II children, it was necessary to determine which child had demonstrated greater improvement. This was accomplished by examining relative improvement for each of the dependent variables.
Table 4.3 Comparison of Progress: Pair #1 (MR and DO)

<table>
<thead>
<tr>
<th>Language Area</th>
<th>Dependent Variables</th>
<th>Child/Group</th>
<th>Pre-test Performance</th>
<th>Post-Test Performance</th>
<th>Difference</th>
<th>Child showing more progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>General:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicative Behaviours</td>
<td>total # produced during communication sample</td>
<td>DO - Group II</td>
<td>68</td>
<td>169</td>
<td>246% increase</td>
<td>DO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MR - Group I</td>
<td>87</td>
<td>94</td>
<td>108% increase</td>
<td>(Group II)</td>
</tr>
<tr>
<td>Specific:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal Communication</td>
<td>% verbal communicative behaviours</td>
<td>DO - Group II</td>
<td>17.7% (12/68)</td>
<td>43% (80/169)</td>
<td>+ 25%</td>
<td>DO</td>
</tr>
<tr>
<td></td>
<td>(If verbal attempts) (If communication attempts)</td>
<td>MR - Group I</td>
<td>0%</td>
<td>18% (80/169)</td>
<td>+ 18%</td>
<td>(Group II)</td>
</tr>
<tr>
<td>Lexical Semantics</td>
<td>MacArthur CDI - raw score</td>
<td>DO - Group II</td>
<td>15 words</td>
<td>147 words</td>
<td>+ 132 words</td>
<td>DO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MR - Group I</td>
<td>14 words</td>
<td>20 words</td>
<td>+ 6 words</td>
<td>(Group II)</td>
</tr>
</tbody>
</table>
A summary of the progress shown by MR and DO has been provided in Table 4.3. The right-hand column signifies the child demonstrating greater progress on each of the language variables examined. As is readily apparent, DO, the Group II child (individualized component), evidenced superior gains in 2 out of 3 specific measures of language growth. These results were supported by the pair’s performance on a more general measure of communicative ability, the total number of communication behaviours produced during a 1-hour play interaction.

There are, of course, difficulties in attempting to compare children using non-identical dependent variables (e.g., DO’s production of question responses vs. MR’s use of comments). These are acknowledged. The difficulties, however, are not as great as one might initially expect. The reader is reminded that this study used pre- vs. post-test production changes for specific targeted forms in order to evaluate progress (i.e., as dependent variables). Prior to intervention, these variables were selected as observation targets for the children in Group I, and as intervention targets for Group II children. Target forms were identified using the same criteria for each child, and were selected on the basis of prior indications that they were forms the child was developmentally ‘ready’ to learn. In most cases, they were also the forms considered most likely to evidence change over the short-term. Thus, although children were compared according to progress shown on different language forms, the targets were similar enough that comparison was meaningful. This method of comparison was felt to capture, in at least a general way, the relative progress shown by MR and DO over the course of the treatment interval.
II. PAIR #2 - PC and MH

A. Group II child (individualized component) - PC

1. General Description

PC, aged 2;9 at initial assessment, presented with significant delays in both language comprehension and production, with difficulties most evident in the area of production. Despite these delays, PC was extremely sociable and interactive, frequently initiating communication with others through non-verbal means, i.e., gesture, intonation/vocalization patterns (e.g., vocalizing with rising intonation while holding up an unfamiliar toy), and sound effects (e.g., car and animal noises during play). These were supplemented by occasional verbal productions, which consisted exclusively of single-word utterances and routinized question forms (e.g., 'Wassat?'). PC also engaged in vocal play and babbling. PC expressed a wide variety of communicative intents, including both initiations (i.e., comments and requests) and responses (i.e., acknowledgements and answers).

Communication areas targeted during intervention included: verbal vs. gestural-vocal production, vocabulary size, and relational semantics.

2. Initial Assessment (Pre-test) Results

a. Verbal Communication

PC communicated a total of 130 times during an hour-long play session. 52 of his communicative bids (40%) were verbal; the remaining 78 (60%) were gestural-vocal. PC produced a total of 11 different single-word utterances.
b. Semantic Skills

Lexicon: The MacArthur Communicative Development Inventory - Toddler Form (1989) was used as an estimate of vocabulary size. PC received a raw score of 50 on this instrument. His performance placed him well below the 10th percentile for his age.

Semantic Relations: Because the utterances produced by PC were limited to single-words, semantic relational analysis was not performed at pre-test. Over time, however, PC began to produce more multi-word utterances. As a result, two specific categories were eventually selected as intervention targets. These were Activity and Recurrence. The total number of relational categories expressed by PC was also used as a more general measure of semantic progress.

3. Post-test Results

a. Verbal Communication

During a 1-hour language sample collected at follow-up, PC produced 333 communicative behaviours. Of these, 250 were verbal. Compared to pre-test production, this represents a 5-fold increase in the number of utterances produced. The fact that 75% of PC's communicative behaviours were now verbal - an increase of 35% since initial assessment - indicated that PC had begun to use language rather than gesture as his primary means of communication. This conclusion finds further support in PC's use of non-verbal behaviours. While non-verbal strategies had previously been used to introduce new topics and ideas, they now took a more secondary communicative role. At post-test, gesture was used mainly to supplement verbal information, and to help clarify
Table 4.4  Pre- vs. Post-test Performance on Dependent Variables: PC (Treatment Group II)

<table>
<thead>
<tr>
<th>Language Area</th>
<th>Dependent Variables</th>
<th>Pre-test Performance</th>
<th>Post-test Performance</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utterance Length</td>
<td>% of multi-word utterances</td>
<td>0%</td>
<td>29.6%</td>
<td>+ 29.6%</td>
</tr>
<tr>
<td></td>
<td>(# multiword utterances) - (total # utterances)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicative Behaviours</td>
<td>total # produced during communication sample</td>
<td>130</td>
<td>333</td>
<td>256% increase</td>
</tr>
<tr>
<td><strong>Specific:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal Communication</td>
<td>% verbal communicative behaviours</td>
<td>40%</td>
<td>75%</td>
<td>+ 35%</td>
</tr>
<tr>
<td></td>
<td>(# verbal attempts) / (total attempts)</td>
<td>(32/130)</td>
<td>(250/333)</td>
<td></td>
</tr>
<tr>
<td>Lexical Semantics</td>
<td>MacArthur CDI - raw score</td>
<td>50 words produced</td>
<td>236 words produced</td>
<td>472% increase</td>
</tr>
<tr>
<td>Communicative Intents</td>
<td>total # of relational categories expressed</td>
<td>0</td>
<td>7</td>
<td>+ 7</td>
</tr>
</tbody>
</table>
intended meanings, especially following communication breakdowns.

b. **Semantic Skills**

**Lexicon:** PC produced 236 words on the *MacArthur CDI* (1989), almost 5 times as many as he had produced at initial assessment. While his performance still placed him below the 10th percentile relative to age-peers, his progress in comparison to *language*-matched peers was excellent. For children who perform, like PC, at the 50-word level at pre-test, the *MacArthur CDI* would predict a production increase of approximately 90 words (raw score of 140) by the end of a 4-months (i.e., about 3 times the original score). The degree of progress demonstrated by PC (i.e., nearly a 5-fold increase in vocabulary size) was clearly greater than would typically be expected.

**Semantic Relations:** 74 of the 250 utterances produced by PC at post-test were combinations of two or more words. These multi-word utterances were used to evaluate his production of semantic relations. PC produced at least 2 exemplars for 7 out of the 9 relational categories examined (Criterion was not met for Causality and Physical State.) 3 categories accounted for 65% of the semantic relations expressed; these were Demonstratives, Recurrence, and Statives (e.g., 'I want', 'Like it').

The two categories targeted during intervention showed significant progress. As mentioned above, Recurrence (23% of the relations produced) was one of those most frequently expressed by PC. It is interesting to note, however, that although PC's mother had focused on use of 'more + _______' to target Recurrence, PC's production of this relation at post-test was limited exclusively to '_______ + too'.

A second target category, Activity, was expressed by PC 11.6% of the time.
Activity relations were produced in multi-word utterances 8 times during follow-up language testing, and attempted in single-word utterances twice. This suggests that when PC wished to express Activity relations, he succeeded in doing so using multi-word utterances some 80% of the time.

4. **Summary of Progress**

   PC made excellent gains in language production skills over the treatment interval. This growth was reflected in each of the 3 areas chosen to evaluate language progress. Most striking was PC's increased reliance on verbal rather than gestural-vocal production in order to communicate ideas and information. In addition, PC demonstrated a marked increase in his use of multi-word utterances. Accelerated semantic acquisition was also in evidence. Essentially, PC had become a 'verbal' communicator by the end of the 4-month test interval.

B. **Group II child (no individualized treatment) - MH**

1. **General description**

   MH was aged 2;1 at the time of initial assessment, 8 months younger than PC. He presented with significant delays in language production, and average verbal comprehension skills. MH communicated primarily through gesture and facial expression, combined with intonation/vocalization patterns and occasional words (15 words during a 1-hour play interaction). These were largely unintelligible. Like PC, MH appeared strongly motivated to communicate in spite of his difficulties, and was able to express a
wide range of purposes and intents non-verbally. Phonological problems in combination with general oral-motor difficulties strongly suggested a possible motor component to MH's communication delay.

2. Initial Assessment (Pre-test) Results
   a. Verbal Communication

   MH produced a total of 91 communicative behaviours at initial assessment. 16% of these (15 attempts) were single-word utterances. The remaining 84% of MH's communicative behaviours were non-verbal, consisting of gestures, sound effects, facial expressions, and babbling. These behaviours were well-distributed across 5 types of communicative intent, including comments, requests (for action and information), acknowledgements, and question responses.

   b. Semantic Skills

   Lexicon: Vocabulary size was estimated at approximately 22 words using the MacArthur CDI (1989). MH's performance placed him below the 10th percentile relative to other children his age.

   Semantic Relations: Like PC, MH's pre-test verbal utterances were limited to single words. As a result, relational analysis was not performed as part of the initial assessment.

3. Post-test Results
   a. Verbal Communication

   MH produced a total of 143 communicative behaviours at follow-up. Of these, 77
<table>
<thead>
<tr>
<th>Language Area</th>
<th>Dependent Variables</th>
<th>Pre-test Performance</th>
<th>Post-test Performance</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utterance Length</td>
<td>% of multi-word utterances</td>
<td>0%</td>
<td>3.9%</td>
<td>+ 3.9%</td>
</tr>
<tr>
<td></td>
<td>(# multiword utterances) / (total # utterances)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicative</td>
<td>total # produced during communication sample</td>
<td>91</td>
<td>143</td>
<td>157% increase</td>
</tr>
<tr>
<td>Behaviours</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Specific:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal Communication</td>
<td>% verbal communicative behaviours</td>
<td>16%</td>
<td>54%</td>
<td>+ 38%</td>
</tr>
<tr>
<td></td>
<td>(# verbal attempts) / (total attempts)</td>
<td>(15/81)</td>
<td>(77/143)</td>
<td></td>
</tr>
<tr>
<td>Lexical Semantics</td>
<td>MacArthur CDI - raw score</td>
<td>22 words produced</td>
<td>60 words produced</td>
<td>273% increase</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicative</td>
<td>total # of relational categories expressed</td>
<td>0</td>
<td>1</td>
<td>+ 1</td>
</tr>
<tr>
<td>Intents</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
were verbal. These results indicated a significant increase in MH's use of verbal communication. MH produced almost 5 times as many utterances during this assessment as he had during a session of comparable length at pre-test. In addition, 54% of his communication attempts were now verbal, an increase of 38% since initial assessment.

Despite gains in verbal ability, non-verbal strategies continued to play an important role in MH's communication repertoire. MH continued to use gesture, facial expression, and vocalization to express a wide range of communicative intents and functions.

b. **Semantic Skills**

**Lexicon**: Vocabulary size, as measured by the MacArthur CDI grew from 22 to 60 words over the treatment interval. This difference represents an almost 3-fold increase in productive vocabulary. MH's performance again placed him well below the 10th percentile for his age. However, MH's rate of lexical acquisition (an average of 9 new words per month) appeared fairly typical when compared to that of children functioning at a similar stage of language development (Benedict, 1979; Nelson, 1973). For children producing fewer than 50 words, the average rate of acquisition lies roughly between 9 and 11 new words per month.

**Semantic Relations**: Only 3 of the 78 utterances produced by MH at post-test were multi-word combinations: 'Mom blow' (produced twice), and 'I do'. Both these utterances were used to express Activity.

4. **Summary of Progress**

MH, aged 2;5 at post-test, evidenced gains in a number of communicative abilities. As with PC, the most striking of these was a marked increase in verbal communicative
behaviours. While MH continued to produce non-verbal behaviours, he now used language slightly more than half the time to express himself. Productive vocabulary size also increased significantly.

C. PC and MH: Comparison of Progress

A progress summary for PC and MH is provided in Table 4.6. In 2 out of 3 specific language variables used to evaluate progress, the Group II child (individualized treatment) again showed greater improvement. PC's superior performance was also evident in two general measures of communication ability.

Because PC was older than MH by 8 months, and clearly more linguistically advanced even at pre-test, some might argue that his accelerated growth, particularly in the area of productive vocabulary, could simply be attributed to a threshold effect. Indeed, most children do undergo a 'spurt' of language development shortly after reaching the 50-word productive stage. While this threshold effect may certainly have contributed to PC's excellent progress, it cannot account for all the performance differences observed between PC and MH over the treatment interval. On measures of productive vocabulary, for example, PC's progress relative to children at his language level, was well beyond that predicted by normative data. MH, by comparison, progressed at a rate more commensurate with that of his language peers. On balance, then, PC seems to have demonstrated more dramatic gains in communication ability.
Table 4.6   Comparison of Progress: Pair #2 (PC and MH)

<table>
<thead>
<tr>
<th>Language Area</th>
<th>Dependent Variables</th>
<th>Child/Group</th>
<th>Pre-test Performance</th>
<th>Post-Test Performance</th>
<th>Difference</th>
<th>Child showing more progress</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utterance Length</td>
<td>% of multi-word utterances</td>
<td>PC - Group II</td>
<td>0%</td>
<td>29.6%</td>
<td>+ 29.6%</td>
<td>PC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MH - Group I</td>
<td>0%</td>
<td>3.9%</td>
<td>+ 3.9%</td>
<td>(Group II)</td>
</tr>
<tr>
<td>Communicative</td>
<td>total # produced during communication sample</td>
<td>PC - Group II</td>
<td>130</td>
<td>333</td>
<td>256% increase</td>
<td>PC</td>
</tr>
<tr>
<td>Behaviours</td>
<td></td>
<td>MH - Group I</td>
<td>91</td>
<td>143</td>
<td>157% increase</td>
<td>(Group II)</td>
</tr>
<tr>
<td>Specific:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal Communication</td>
<td>% verbal communicative behaviours</td>
<td>PC - Group II</td>
<td>40% (S2/130)</td>
<td>75% (250/333)</td>
<td>+ 35%</td>
<td>no difference</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MH - Group I</td>
<td>16% (15/91)</td>
<td>54% (77/143)</td>
<td>+ 38%</td>
<td></td>
</tr>
<tr>
<td>Lexical Semantics</td>
<td>MacArthur CDI - raw score</td>
<td>PC - Group II</td>
<td>50 words</td>
<td>236 words</td>
<td>472% increase</td>
<td>PC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MH - Group I</td>
<td>22 words</td>
<td>60 words</td>
<td>273% increase</td>
<td>(Group II)</td>
</tr>
<tr>
<td>Semantic Relations</td>
<td>total # of relational categories expressed</td>
<td>PC - Group II</td>
<td>0</td>
<td>7</td>
<td>+ 7</td>
<td>PC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MH - Group I</td>
<td>0</td>
<td>1</td>
<td>+ 1</td>
<td>(Group II)</td>
</tr>
</tbody>
</table>
III. PAIR #3 - JB and JW

A. Group II child (Individualized component) - JB

1. Initial Assessment (Pre-test) Results

   a. General observations

   JB, aged 3;3 at initial assessment, demonstrated significant delays in expressive language abilities, particularly in the areas of syntax and morphology. His comprehension was average. In addition to single-word utterances, JB produced a large number of 2- and 3-word combinations. His use of selected lexical, morphological, and sentence pattern forms placed him at Johnston, Ammon & Kamhi’s (1988) early Stage II (roughly comparable to Brown, 1973). His language production was characterized by frequent pauses, false starts, and sentence reformulations, particularly when attempting utterances of 3 words or more. These, in combination with JB’s mild phonological difficulties, frequently made him difficult to understand, particularly in the absence of a shared context.

   Language areas focused on during pre- and post-test evaluations were relational semantics, inflectional morphology, and syntax. Both general and specific measures of performance in these areas were used to measure progress.

   b. Relational Semantics

   The distribution of semantic relations expressed by JB over 9 different relational categories was examined. JB produced exemplars in each of the categories examined, but distribution was uneven. Two categories, Physical State (e.g., ‘A dog big.’) and Location (e.g., ‘This out.’, ‘The man off.’) comprised more than half (i.e., 51.3%) of the
relations expressed. Production of Causal relations (e.g., ‘Me do.’, holding up a picture he had just drawn), used only 2.8% of the time, was targeted as a dependent variable and potential language goal.

c. Syntax and Morphology

As stated earlier, morpho-syntactic ability was an area of relative weakness for JB. Two general measures were used to evaluate performance. Both were based on language-sample performance. JB achieved a raw score of 52, which placed him - 2.0 standard deviations below the mean on the Index of Productive Syntax (IPSyn) (Scarborough, 1990). MLU (in morphemes) was calculated at 1.83, placing him - 2.17 standard deviations below the mean for his age (Miller, 1981).

Because IPSyn and MLU are two measures that tend to conflate morphological and syntactic skills, these areas were assessed in greater depth by analyzing JB’s use of selected morphemes and syntactic forms.

(1) Inflectional Morphology: Overall, JB’s production of grammatical morphemes was extremely limited. In a 508-utterance sample, only 3 examples of inflectional markers were produced. Two specific morphemes were selected as intervention targets:

(a) progressive ‘ - ing ’ was produced once by JB, and omitted 4 times in obligatory contexts (20% production in obligatory context).

(b) contractible copula ‘ is ’ occurred twice, but was omitted in 60 obligatory contexts (3% production in obligatory context).

(2) Syntax: Two sentence patterns were chosen as potential intervention targets:
(a) 'subject + verb + object' was produced 4 times by JB, and attempted 3 times (57% success rate). (An attempt was defined here as an omission of either subject, verb, or object from an obligatory context.)

(b) '(noun +) catenative + verb + noun' was neither attempted nor produced by JB during the pre-test language sample. (An attempt for catenative structures was defined as any utterance in which the child expressed intent or predicted an action that had not yet occurred. The reader will note that this definition applies to 'gonna', 'let's' and 'wanna' only; in practice, it was not possible to determine obligatory context for other catenatives such as 'hafta', 'gotta' or 's'posedta'.)

2. Post-test Results

a. General observations

JB was aged 3;7 at post-test. Overall, he presented as a more confident and fluent communicator at follow-up than he had during initial assessment. Informal observation indicated a marked decrease in the number of pauses and sentence reformulations. Also encouraging was JB's move from a stage assignment of early Stage II to Stage III (Johnston, Ammon, & Kamhi, 1988).

b. Semantic Relations

At post-test, JB's use of semantic relations was generally more evenly distributed across categories. Only 27.6% were devoted to Location and Physical State (as opposed to 51.3% at pre-test). Meanwhile, use of the target category, Causals, had increased to 19.7% of relations expressed. This represented an increase of 16.9% compared to his
<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Pre-test Results</th>
<th>Post-test Results</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language Stage</td>
<td>early II</td>
<td>III</td>
<td></td>
</tr>
<tr>
<td>IPSyn - raw score</td>
<td>52</td>
<td>61</td>
<td>+ 9</td>
</tr>
<tr>
<td>MLU raw score</td>
<td>1.83</td>
<td>2.13</td>
<td>+ 0.30</td>
</tr>
<tr>
<td>standard score</td>
<td>- 2.17</td>
<td>- 2.02</td>
<td>+ 0.15</td>
</tr>
<tr>
<td><strong>Specific:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semantic Relations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Causals</td>
<td>6 214 2.8 %</td>
<td>80 406 19.7%</td>
<td>+ 52 + 192 + 16.9%</td>
</tr>
<tr>
<td>Morphology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>prog. ' - ing'</td>
<td>1 4 20 %</td>
<td>1 5 17 %</td>
<td>0 + 1 - 3 %</td>
</tr>
<tr>
<td>copula ' is '</td>
<td>2 60 3 %</td>
<td>1 27 7 %</td>
<td>- 1 - 33 + 4 %</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S + V + O</td>
<td>5 3 57 %</td>
<td>15 5 75 %</td>
<td>+ 13 + 2 + 18 %</td>
</tr>
<tr>
<td>(N +) eaten + V + N</td>
<td>0 0 0 %</td>
<td>12 11 52 %</td>
<td>+ 12 + 11 + 52 %</td>
</tr>
</tbody>
</table>
c. **Syntax and Morphology**

JB's progress with respect to production of morpho-syntactic forms was mixed. His MLU at post-test was 2.13, yielding a standard score of -2.02 (an increase of only 0.15 s.d.). JB achieved a raw score of 61 on the IPSyn. This represents an increase of 9 points since first assessment. (Standard scores were not used as a measure of progress on the IPSyn because of the short interval between testing. Test norms are provided for children at 6 month intervals.) JB produced 4 new forms that had been absent at pre-test. These were all sentence-level syntactic forms: 'catenative + verb + noun', medial negation (e.g., 'Him not go.'), conjoined sentences, and wh-clauses (e.g., 'Look what me found in here.').

(1) **Inflectional morphology:** Persistent weaknesses in inflection morphology seemed to account for JB's marginal performance on MLU. At post-test, he continued to demonstrate extremely limited use of early inflectional markers. His production of targeted morphemes showed essentially no change over the treatment interval.

(a) *progressive* ' -ing ' was produced once, and attempted 5 times (17% in obligatory context).

(b) *contractible copula* 'is' was produced twice, and omitted from obligatory context 27 times. While this calculates to 7% production in obligatory context, a small increase of 4% compared to pre-test results, the main reason for the increase seems to be fewer attempts, rather than increased correct productions.

(2) **Syntax:** When syntax and morphology are investigated separately, important
differences in JB's performance emerge. In contrast to inflectional morphology, productive syntax was an area of impressive growth for JB. Pre- and post-test analysis of his use of targeted forms revealed the following:

(a) 'subject + verb + object' was produced 15 times during the post-test language sample, and attempted an additional 5 times. In a language sample of comparable size collected at pre-test, the form had been produced only 4 times, with 3 unsuccessful attempts. This translates to a 3-fold increase in production of the pattern. The data also corresponds to 75% success rate at follow-up, an increase of 18% from the initial assessment.

(b) ' (noun) + catenative + verb + noun' showed striking improvement: JB produced 12 occurrences and 11 attempts at this form (52% successful), although it had been neither attempted nor produced at pre-test. The observed increase in attempts is as encouraging as the gain shown in production. In early language development, increases in the number of opportunities for use of a specific form has been identified as a precursor to increased production of that form (Ingram, 1972).

3. Summary of Progress

JB showed considerable progress over the 3-month treatment interval. In terms of overall language development, he moved from an early Stage II to mid Stage III assignment (Johnston, Ammon & Kamhi, 1988).

Greatest progress was seen in the areas of semantics and sentence level syntax.
At post-test, JB demonstrated expanded use of several relational categories, especially for the targeted category, Causals. With regards to syntax, JB's production of two targeted sentence patterns increased sharply. Inflectional morphology was the one area under study that evidenced no change.

Unfortunately, due to the short time frame, as well as persistent inflectional difficulties, these gains were not evident in more general measures of syntax and morphology, i.e., IPSyn and MLU.

B. Group I child (no individualized treatment) - JW

1. Initial Assessment (Pre-test) Results

   a. General observations

   JW was aged 3;1 at the beginning of the study. As with JB, expressive language skills showed significant delays, while verbal comprehension was within average limits. Productively, JW demonstrated fewer morphological difficulties than JB, but showed similar weaknesses in syntactic ability. His use of selected linguistic forms placed him at Johnston, Ammon & Kamhi's (1988) late Stage II. Occasional sentence formulation difficulties and word-order errors were noted.

   a. Relational Semantics

   JW's use of semantic relations showed fairly well-established use across most categories, with the majority of utterances expressing Demonstration, Negation, Activity, and Causality (71.4% in total). The category Statives was targeted for observation. Approximately 5.7% of JW's pre-test multi-word productions were used to express this
relation; he produced 9 exemplars (e.g., ‘No like it’), and 6 additional single-word utterances that expressed the same content (‘Want’, while reaching for a toy).

b. **Syntax and Morphology**

On general measures of morpho-syntactic ability, JW’s performance was comparable to that of JB at pre-test. JW scored -1.70 on the IPSyn, with a raw score of 55. He achieved an MLU of 1.82, yielding a standard score of -1.70.

1. **Inflectional morphology:** JW’s performance in the area of inflectional morphology was somewhat superior to that of JB, showing established use of a number of inflectional markers, including plural ‘s’, and progressive ‘-ing’. The following two morphemes were chosen for pre- vs. post-test comparison:

   (a) *regular past tense* ‘-ed’ was marked by 1 occurrence, and 4 omissions from obligatory contexts (20% occurrence in obligatory context).

   (b) *3rd person progressive singular* ‘-s’ was produced once and omitted twice during the pre-test language sample (33% occurrence in obligatory context).

2. **Syntax:** Two sentence patterns were chosen in order to monitor syntactic growth:

   (a) ‘*noun + *no/not* + verb’ was produced once during pre-test, and unsuccessfully attempted twice (33% success rate).

   (b) ‘* (noun) + catenative + verb + noun*’ was attempted 5 times, although never accurately produced (0% success) by JW.
Table 4.8  Pre- vs. Post-test Performance on Dependent Variables: JW (Treatment Group I)

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Pre-test Results</th>
<th>Post-test Results</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>General:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language Stage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPSyn - raw score</td>
<td>55</td>
<td>58</td>
<td>+ 3</td>
</tr>
<tr>
<td>MLU raw score</td>
<td>1.82</td>
<td>2.33</td>
<td>+ 0.51</td>
</tr>
<tr>
<td>standard score</td>
<td>- 1.70</td>
<td>- 1.51</td>
<td>+ 0.42</td>
</tr>
<tr>
<td>Specific:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semantic Relations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># productions</td>
<td>9</td>
<td>41</td>
<td>+ 32</td>
</tr>
<tr>
<td>total # relations</td>
<td>157</td>
<td>336</td>
<td>+ 179</td>
</tr>
<tr>
<td>expressed</td>
<td>5.7 %</td>
<td>12.2 %</td>
<td>+ 6.5 %</td>
</tr>
<tr>
<td>% production</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morphology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>reg. ' - ed'</td>
<td>1</td>
<td>0</td>
<td>- 1</td>
</tr>
<tr>
<td>3rd pers. ' - a'</td>
<td>1</td>
<td>4</td>
<td>+ 3</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N + 'neg' + V</td>
<td>1</td>
<td>0</td>
<td>- 1</td>
</tr>
<tr>
<td>(N +) caten + V + N</td>
<td>0</td>
<td>10</td>
<td>+ 10</td>
</tr>
</tbody>
</table>

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2. **Post-test Results**

   a. **General observations**

   JW was aged 3;4 at follow-up assessment. In conversational speech, he continued to demonstrate occasional false starts and sentence recasts, although word-order errors were generally less evident than at pre-test. JW's production of selected linguistic forms placed him at a language level of about Stage III.

   a. **Semantic Relations**

   As in the pre-test condition, JW's production of semantic relations was well distributed across all 9 categories. Use of the target relation, Statives, increased to 12.2% of total relations expressed (an increase of 6.5%).

   b. **Syntax and Morphology**

   General measures used to assess productive syntax and morphology indicated significant progress for JW. MLU at post-test was 2.33, yielding a standard score of -1.51 (an increase of 0.42 s.d.). His IPSyn raw score was 58, an increase of 3 points since pre-test. JW evidenced production of 2 new language forms that had been absent from his pre-test output; these were both 'wh' question forms.

   (1) **Inflectional morphology:** JW's progress with respect to use of grammatical morphemes was mixed:

   (a) *regular past tense* ' -ed ' No evidence for progress was seen in JW's use of this target morpheme. It was attempted only once, and never produced (0% production in obligatory context).

   (b) *3rd person progressive singular* ' -s ' development was somewhat more
encouraging. JW produced the form 4 times, and omitted it 13 times in obligatory contexts. These observations yield a final result of 23% production in obligatory context. Although this is a drop from the pre-test value, what is encouraging about JW's performance is the increase in obligatory contexts (from 2 to 13).

(2) Syntax: Pre- vs. post-test comparison of target sentence patterns indicated the following:

(a) 'noun + 'no/not' + verb' did not evidence progress. JW attempted this pattern 3 times, but produced no exemplars of the form (0% success).

(b) '(noun) + Catenative + verb + noun' usage did increase significantly over the interval. At post-test, JW provided 10 accurate productions of this pattern, and 12 attempts (46% success rate, up from 0% at pre-test).

3. Summary of Progress

JW's language production skills improved measurably from pre- to post-test, resulting in a move from late Stage II to mid Stage III by the end of treatment. Progress was observed in each of the three areas chosen for study, (semantic relations, inflectional morphology, and syntax) although results on specific forms were somewhat mixed.

Development with respect to relational semantics was evidenced by JW's increased production of the target category, Statives. In the area of morphology, JW showed increased production for 1 out of 2 targeted inflectional markers. Performance with regards to selected syntactic structures was the same: improved performance in 1 out of 2 targeted forms. These findings were supported by more general measures of morpho-syntactic ability, i.e., MLU and IPSyn.
Table 4.9 Comparison of Progress: Pair #3 (JB and JW)

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Child</th>
<th>Pre-test Results</th>
<th>Post-test Results</th>
<th>Difference</th>
<th>Child Showing more progress</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semantic Relations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Causals</td>
<td>JB (Group II)</td>
<td>6 214 2.8 %</td>
<td>80 406 19.7 %</td>
<td>+ 52 192 16.9 %</td>
<td>JB</td>
</tr>
<tr>
<td>Statives</td>
<td>JW (Group I)</td>
<td>9 157 5.7 %</td>
<td>41 336 12.2 %</td>
<td>+ 32 179 6.5 %</td>
<td>(Group II)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morphology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. prog. '-ing'</td>
<td>JB (Group II)</td>
<td>1 4 20 %</td>
<td>1 5 17 %</td>
<td>0 1 -3 %</td>
<td>no difference</td>
</tr>
<tr>
<td>reg. '-ed'</td>
<td>JW (Group I)</td>
<td>1 4 20 %</td>
<td>0 1 0 %</td>
<td>- 1 -3 20 %</td>
<td>(Group I)</td>
</tr>
<tr>
<td>3. copula 'is'</td>
<td>JB (Group II)</td>
<td>2 60 3 %</td>
<td>1 27 7 %</td>
<td>- 1 -33 4 %</td>
<td>JW</td>
</tr>
<tr>
<td>3rd pers. '-s'</td>
<td>JW (Group I)</td>
<td>1 2 33 %</td>
<td>4 13 23 %</td>
<td>+ 3 11 -33 %</td>
<td>(Group II)</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. S + V + O</td>
<td>JB (Group II)</td>
<td>4 3 57 %</td>
<td>15 5 75 %</td>
<td>+ 13 2 18 %</td>
<td>JB</td>
</tr>
<tr>
<td>N + 'neg' + V</td>
<td>JW (Group I)</td>
<td>1 2 33 %</td>
<td>0 3 0 %</td>
<td>- 1 + 1 -33 %</td>
<td>(Group II)</td>
</tr>
<tr>
<td>5. (N +) caten + V + N</td>
<td>JB (Group II)</td>
<td>0 0 0 %</td>
<td>12 11 52 %</td>
<td>+ 12 11 52 %</td>
<td>JB</td>
</tr>
<tr>
<td></td>
<td>JW (Group I)</td>
<td>0 5 0 %</td>
<td>10 12 46 %</td>
<td>+ 10 7 46 %</td>
<td>(Group II)</td>
</tr>
</tbody>
</table>
Table 4.10  Comparison of Progress - General Measures: Pair #3 (JB and JW)

<table>
<thead>
<tr>
<th>General Language Measure</th>
<th>Child/Group</th>
<th>Pre-test Performance</th>
<th>Post-Test Performance</th>
<th>Difference</th>
<th>Child showing more progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language Stage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Johnston, Ammon &amp; Kamhi, 1988)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JB - Group II</td>
<td>early II</td>
<td>III</td>
<td>NA</td>
<td>JB</td>
<td>(Group II)</td>
</tr>
<tr>
<td>JW - Group I</td>
<td>late II</td>
<td>III</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Index of Productive Syntax</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JB - Group II</td>
<td>52</td>
<td>61</td>
<td>+ 9</td>
<td>JB</td>
<td>(Group II)</td>
</tr>
<tr>
<td>JW - Group I</td>
<td>55</td>
<td>58</td>
<td>+ 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Length of Utterance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JB - Group II</td>
<td>1.83</td>
<td>2.13</td>
<td>+ 0.30</td>
<td>JW</td>
<td></td>
</tr>
<tr>
<td>JW - Group I</td>
<td>1.82</td>
<td>2.33</td>
<td>+ 0.51</td>
<td></td>
<td>(Group I)</td>
</tr>
<tr>
<td>(in morphemes)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JB - Group II</td>
<td>- 2.17</td>
<td>- 2.02</td>
<td>+ 0.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JW - Group I</td>
<td>- 1.70</td>
<td>- 1.51</td>
<td>+ 0.42</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
C. JB and JW: Comparison of Progress

A summary of pre- and post-test language results for Pair #3 is included in Tables 4.9 and 4.10. As with the previous two pairs, the Group II child (parents received individualized treatment) seems once again to have made greater progress than his Group I counterpart.

In 3 out of 5 specific language variables used to evaluate progress, JB's (Group II) gains were superior to those of JW (Group I). These results were only partially supported by findings from two more general measures of language development. JW demonstrated greater improvement in MLU, while JB seemed to make more progress on the IPSyn. This discrepancy seems to due primarily to differences in acquisition of inflectional morphology.

IV. PAIR #4 - WB and JH

A. Group II child (individualized component) - WB

1. Initial Assessment (Pre-test) Results

   a. General description

   WB was aged 2;9 at initial assessment. While her comprehension of language was age-appropriate, WB presented with significant delays in language production. She used mostly one- and two-word utterances, frequently supplemented by gestures and facial expression, to communicate a wide variety of communicative intents and conversational functions. WB's productive vocabulary was extremely limited. Lexical deficits seemed to contribute to her overall communication difficulties; WB frequently
inserted gestures in the middle of utterances, particularly in place of verbs (‘Me + ‘blowing gesture’ + now’, to request her turn at blowing up a balloon). She made frequent use of idiosyncratic forms (e.g., ‘heehee’ for ‘horse’). These were often overgeneralized to refer to object classes (e.g., ‘byooey’ was used to label several different clothing items).

WB’s use of selected language structures placed her at Johnston, Ammon and Kamhi’s (1988) linguistic Stage I.

Communication areas targeted during intervention included: semantics (lexical and relational), inflectional morphology, and sentence level syntax.

b. Semantics

Lexicon: Lexical acquisition was significantly delayed, as indicated by WB’s performance on the MacArthur CDI. WB received a raw score of 90 words, which placed her below the 10th percentile relative to other children her age. Type-Token ratio, another estimate of productive vocabulary ability, was also reduced at 0.31. (The expected range of TTR values for children at WB’s language level is between 4.0 and 5.0.)

Semantic Relations: WB’s use of semantic relations was not evenly distributed across relational categories. The majority of her multi-word utterances were used to express Negation (37.1% of the relations expressed), Location (25.8%), and Activity (14.5%). Increased production of Causal relationships was targeted as an intervention goal for WB. At pre-test, approximately 3.2% of the relations produced by WB expressed Causality; she produced 2 exemplars (e.g., ‘Me open it’), as well as 4 ‘attempts’, i.e., single-word utterances (sometimes combined with a gesture) intended to express the
same content (e.g., Child mimes blowing, followed by 'balloon', while requesting that the examiner blow up a balloon).

c. Syntax and Morphology

As with the preceding pair (Pair #3), two general measures were used to assess productive syntax and morphology skills. Both measures indicated severe delays. WB received a raw score of 21 on the IPSvn (standard score of -3.4). MLU (in morphemes) was calculated at 1.30. This placed her -2.45 standard deviations below the mean for her age.

Morpho-syntactic abilities were assessed in greater depth by analyzing WB's use of selected morphological markers and syntactic forms.

(1) Inflectional Morphology: Inflectional morphology was an area of marked deficit for WB. A 327-utterance corpus contained no observed attempts or productions for any morphological marker. Progressive ' -ing ' was selected as an intervention target.

(2) Syntax: Two sentence patterns were chosen as potential language goals:

(a) 'verb + object' was attempted 3 times by WB during pre-test. (Here, an attempt was defined as an omission of either the verb or the object from an obligatory context.) There were no instances of correct production.

(b) 'subject + verb + object' was attempted only once. Once again, there were no instances of correct production for this sentence pattern.
Table 4.11 Pre- vs. Post-test Performance on Dependent Variables: WB (Treatment Group II)

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Pre-test Results</th>
<th>Post-test Results</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language Stage</td>
<td>I</td>
<td>late II</td>
<td>--</td>
</tr>
<tr>
<td>IPSyn - raw score</td>
<td>21</td>
<td>44</td>
<td>+ 23</td>
</tr>
<tr>
<td>MLU raw score</td>
<td>1.30</td>
<td>1.63</td>
<td>+ 0.33</td>
</tr>
<tr>
<td>standard score</td>
<td>-2.45</td>
<td>-2.21</td>
<td>+ 0.24</td>
</tr>
<tr>
<td>Vocabulary Size</td>
<td>90 words</td>
<td>265 words</td>
<td>294 % increase</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Pre-test Results</th>
<th>Post-test Results</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specific:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semantic Relations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Causals</td>
<td>2</td>
<td>62</td>
<td>3.2 %</td>
</tr>
<tr>
<td></td>
<td>35</td>
<td>302</td>
<td>11.6 %</td>
</tr>
<tr>
<td></td>
<td>+ 33</td>
<td>+ 240</td>
<td>+ 8.4 %</td>
</tr>
<tr>
<td>Morphology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>progressive 'ing'</td>
<td>0</td>
<td>3</td>
<td>0 %</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>38 %</td>
<td></td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb + Object</td>
<td>0</td>
<td>3</td>
<td>0 %</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>52 %</td>
<td></td>
</tr>
<tr>
<td>Subject + verb + object</td>
<td>0</td>
<td>1</td>
<td>0 %</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>36 %</td>
<td></td>
</tr>
</tbody>
</table>
2. **Post-test Results**

   a. **General description**

   WB, aged 3;1 at follow-up, evidenced significant progress in all areas of language development examined. Over a 4-month period, she moved from a linguistic stage assignment of Stage I, to a late Stage II, early Stage III (Johnston, Ammon & Kamhi, 1988). Her improved production abilities were also evident in a general increase in linguistic output; WB produced more than twice as many utterances during the post-test language sample as she had at pre-test (from 327 utterances produced in a period of 70 minutes, to 709 utterances over an 82-minute sample). Use of gestures had decreased noticeably, and she generally presented as a much more confident and effective communicator.

   b. **Semantics**

   **Lexicon:** WB produced 265 words on the MacArthur CDI, almost 3 times the number produced 4 months earlier at pre-test. While her performance still placed her below the 10th percentile relative to age-peers, her progress in comparison with language-matched peers was about average. (For children performing at the 90 word level at pre-test, the MacArthur would predict a productive vocabulary of approximately 275 words by the end of 4 months.) Type-token ratio also indicated improved referential skills, moving from 0.31 at pre-test, to 0.49 (within average limits) at follow-up. WB's improved vocabulary use was evident in her spontaneous language production as well. She relied much less on gesture, and her use of idiosyncratic forms had decreased dramatically, from 12 such 'proto-words' produced at pre-test, to only 3 during the follow-
c. **Syntax and Morphology**

WB's improved morpho-syntactic abilities were manifested in her performance on general indices of language production. Her performance on the IPSyn indicated productive use of 15 new morphological and syntactic structures. She obtained a raw score of 44, a 23 point an increase since pre-test. MLU had increased to 1.63, approximately - 2.21 standard deviations below the mean relative to age peers. This represented a gain of 0.24 s.d.'s since initial assessment.

Similar gains were seen in WB's use of the specific structures and forms targeted during intervention.

1. **Inflectional Morphology:** WB's production of progressive '-ing' showed some improvement over the 4-month interval. While the form had been neither produced nor attempted at pre-test, post-test results included 3 exemplars of correct production, and 5 instances of omission from an obligatory context (38% production in obligatory context).

2. **Syntax:** Pre- vs. post-test comparison of sentence level syntactic skills were extremely encouraging. In addition to increased production of target structures, WB produced 5 new sentence types. These included: intonational questions (e.g., 'Me open this?'), sentences expanded by use of modifiers and prepositional phrases (e.g., 'Get more animal.', 'Puppy sleep up here.'), early sentence conjoining (e.g., 'Me broke; me
and sentence-medial negation (e.g., 'It no fall down').

WB’s post-test production of the two sentence patterns targeted during intervention was as follows:

(a) ‘verb + object’ was produced 15 times at follow-up, and attempted an additional 14 times (52% successful production). This sentence pattern had been attempted only 3 times at initial assessment, with no instances of correct production noted. The observed increase in the number of opportunities for production, as well as in production itself, was considered indicative of significant progress.

(b) ‘subject + verb + object’ was a form that had been previously absent from WB’s productive repertoire. It was produced 5 times at follow-up. In addition, 9 attempts were noted (compared to 1 attempt at pre-test). (As with the previous pair, an attempt for this form was defined as omission of either subject, object, or verb from obligatory context). This corresponds to a 36% success rate for this pattern.

3. **Summary of Progress**

WB made excellent language gains over the treatment interval. Greatest progress was noted in the areas of semantics and sentence level syntax. In addition to an increased productive lexicon, WB demonstrated extended use of several relational categories, especially for the targeted category, Causals. In the area of syntax, WB began to produce a number of newly-acquired sentence forms, and demonstrated increased production for both patterns targeted in treatment. Her use of the inflectional morpheme ‘-ing’ also showed significant improvement.
B. Group I child (no individualized treatment) - JH

1. Initial Assessment (Pre-test) Results

   a. General observations

      JH was aged 3;0 at the beginning of the study. Like WB, he demonstrated age-appropriate language comprehension skills, but presented with significant delays in language production. He was somewhat more linguistically advanced than WB, demonstrating fewer vocabulary difficulties (TTR was average at 0.53), and communicating primarily in 2- and 3-word utterances. His use of selected linguistic forms placed him at about early Stage II, according to Johnston, Ammon & Kamhi's (1988) classification. Some phonological delays were noted; these were considered concomitant with expressive language level.

   b. Relational Semantics

      JH demonstrated well-established use across most semantic relations, with the majority of utterances spread fairly evenly across 6 main categories; these were: Demonstration, Negation, Activity, Causality, Physical State, and Location. The category Statives was targeted for observation. Approximately 5.7% of the relations produced by JH were used to express Internal State; he produced 5 exemplars (e.g., 'Want that one.', 'They all sad.'), and 3 attempts (i.e., single-word utterances intended to express the same content, e.g., 'Sad', pointing to a picture of a sad puppy in response to the examiner's preceding comment that a toy was happy).

   c. Syntax and Morphology

      On general measures of morpho-syntactic ability, JH's performance was again
slightly better than that of WB. His \textit{IPSyn} score was -2.0 (raw score was 45), and he achieved an MLU of 1.82, yielding a standard score of -2.35.

1. \textbf{Inflectional Morphology:} JH's performance in the area of inflectional morphology was somewhat limited. While he showed some use of the plural 's' marker, this was the only grammatical morpheme for which he produced 2 or more exemplars during a 1-hour language sample. \textit{Progressive 'ing'} was selected as a potential language target. There were no instances of production for this form at pre-test, and it was omitted twice from obligatory context.

2. \textbf{Syntax:} Two sentence patterns were chosen in order to monitor syntactic growth:

(a) \textit{subject + verb + object} was produced twice, as well as unsuccessfully attempted twice during initial assessment (50% successful production).

(b) \textit{(noun) + catenative + verb + noun} was attempted twice, although never accurately produced (0% success rate) by JH.

2. \textbf{Post-test Results}

a. \textit{General observations}

JH was aged 3;4 at post-test. He demonstrated excellent progress in all areas of language production, overall presenting as a much more relaxed and efficient speaker than he had 4 months earlier. JH's structural use of language placed him at late Stage III (as compared to early Stage II at pre-test).
<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Pre-test Results</th>
<th>Post-test Results</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language Stage</td>
<td>early II</td>
<td>late III</td>
<td>--</td>
</tr>
<tr>
<td>IPSyn - raw score</td>
<td>45</td>
<td>65</td>
<td>+ 20</td>
</tr>
<tr>
<td>MLU raw score</td>
<td>1.53</td>
<td>2.24</td>
<td>+ 0.71</td>
</tr>
<tr>
<td>standard score</td>
<td>- 2.35</td>
<td>- 1.63</td>
<td>+ 0.72</td>
</tr>
<tr>
<td><strong>Specific:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Semantic Relations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statives</td>
<td>5 123 4.1 %</td>
<td>26 375 6.9 %</td>
<td>+ 21 + 252 + 2.8 %</td>
</tr>
<tr>
<td>Morphology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>progressive</td>
<td>0 2 0 %</td>
<td>5 1 83 %</td>
<td>+ 5 - 1 + 83 %</td>
</tr>
<tr>
<td>&quot;-ing&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subject + Verb + Object</td>
<td>2 2 50 %</td>
<td>9 6 60 %</td>
<td>+ 7 + 4 + 10 %</td>
</tr>
</tbody>
</table>
b. **Relational Semantics**

As in the pre-test condition, JH's production of semantic relations was well distributed across all 9 categories. Use of the target relation, Statives, increased to 6.9% of the total relations expressed (an increase of 2.8%).

c. **Syntax and Morphology**

General measures used to assess morpho-syntactic gains indicated significant progress for JH. MLU at post-test was 2.24, yielding a standard score of -1.63. This represents an increase of 0.72 standard deviations relative to age-peers. On the IPSyn, JH achieved a raw score of 65 (an increase of 20 points since pre-test).

(1) **Inflectional Morphology:** Perhaps JH's most impressive gains were seen in the area of inflectional morphology. At follow-up assessment, he showed established use (i.e., more than 2 exemplars produced during the language sample) of several inflectional markers, including plural '-s', progressive '-ing' (the target morpheme), articles 'a' and 'the', copula and auxiliary 'is', and 3rd person progressive singular '-s'. JH produced the targeted morpheme, progressive '-ing', 5 times, omitting it once from an obligatory context. This form was produced in 83% of obligatory contexts, up from 0% production at initial assessment.

(2) **Syntax:** JH's growth in the area of sentence level syntax was comparable to morphological gains. He evidenced production of 5 new sentence patterns which had been previously absent from his syntactic repertoire; these included the following: *wh-questions (non-frozen)*, *'(noun) + verb + noun + prep.phrase'*, *'noun + negative + verb'*, and use of *catenatives*. Pre- and post-test analysis of JH's use of targeted forms
revealed the following:

(a) 'subject + verb + object' was a form that showed moderate increases in production. It was produced 9 times during the post-test language sample, and unsuccessfully attempted an additional 6 times. These data correspond to 60% successful production, an increase of about 10 percentage points over pre-test performance. The form was also produced more frequently at follow-up: 9 times as opposed to twice. Although this gain was not absolute, given size differences between the two corpora, it still represents a significant increase in production. (JH produced 343 utterances at initial assessment, compared to 605 at post-test.)

(b) '(noun) + catenative + verb + noun' There were 12 incidents of production, and 11 attempts for this form (52% success). This represents a sharp increase relative to pre-test production (i.e., 0 productions and 2 attempts). As mentioned earlier, for any given language form, both increased productions and increased attempts are considered positive indicators for development.

3. **Summary of Progress**

JH demonstrated impressive gains in several areas of language production. Greatest progress was seen in his use of sentence level syntax and inflectional morphology. JH's post-test productions were distinguished by several newly-acquired forms that had not been in evidence 4 months earlier. These included 5 inflectional markers, as well as 5 new sentence patterns. Significant progress was seen in each of the 4 'target' areas selected for JH.
### Table 4.13  Comparison of Progress: Pair #4 (WB and JH)

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Child &amp; Group</th>
<th>Pre-test Results</th>
<th>Post-test Results</th>
<th>Difference</th>
<th>Child Showing More Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td># productions</td>
<td>total #</td>
<td># productions</td>
<td>total #</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>relations</td>
<td>% production</td>
<td>expressed</td>
</tr>
<tr>
<td>Semantic Relations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Causals</td>
<td>WB Group II</td>
<td>2</td>
<td>62</td>
<td>3.2%</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>JH Group I</td>
<td>5</td>
<td>123</td>
<td>4.1%</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morphology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. progressive 'ing'</td>
<td>WB Group II</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>JH Group I</td>
<td>0</td>
<td>2</td>
<td>0%</td>
<td>5</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. V + O</td>
<td>WB Group II</td>
<td>0</td>
<td>3</td>
<td>0%</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>JH Group I</td>
<td>2</td>
<td>2</td>
<td>50%</td>
<td>9</td>
</tr>
<tr>
<td>4. S + V + O</td>
<td>WB Group II</td>
<td>0</td>
<td>1</td>
<td>0%</td>
<td>5</td>
</tr>
<tr>
<td>(N +) caten. + V + N</td>
<td>JH Group I</td>
<td>0</td>
<td>2</td>
<td>0%</td>
<td>12</td>
</tr>
</tbody>
</table>
Table 4.14  Comparison of Progress - General Measures: Pair #4 (WB and JH)

<table>
<thead>
<tr>
<th>General Language Measure</th>
<th>Child/Group</th>
<th>Pre-test Performance</th>
<th>Post-Test Performance</th>
<th>Difference</th>
<th>Child showing more progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language Stage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Johnston, Ammon &amp; Kamhi, 1988)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WB - Group II</td>
<td>I</td>
<td>late II</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JH - Group I</td>
<td>early II</td>
<td>late III</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Index of Productive Syntax</td>
<td>Raw Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1989)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WB - Group II</td>
<td>21</td>
<td>44</td>
<td>+ 23</td>
<td>no difference</td>
<td></td>
</tr>
<tr>
<td>JH - Group I</td>
<td>45</td>
<td>65</td>
<td>+ 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Length of Utterance</td>
<td>Raw Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(in morphemes)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WB - Group II</td>
<td>1.30</td>
<td>1.63</td>
<td>+ 0.33</td>
<td>JH</td>
<td></td>
</tr>
<tr>
<td>JH - Group I</td>
<td>1.53</td>
<td>2.24</td>
<td>+ 0.71</td>
<td>(Group I)</td>
<td></td>
</tr>
<tr>
<td>Standard Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WB - Group II</td>
<td>- 2.45</td>
<td>- 2.21</td>
<td>+ 0.24</td>
<td>(Group I)</td>
<td></td>
</tr>
<tr>
<td>JH - Group I</td>
<td>- 2.35</td>
<td>- 1.63</td>
<td>+ 0.72</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
C. WB and JH: Comparison of Progress

A summary of pre- and post-test language results for Pair #4 is included in Tables 4.13 and 4.14. Table 4.13 examines the progress demonstrated by both children with respect to specific language targets. The right-hand column once again signifies the child showing greater improvement in each of the language variables examined. Progress for Pair #4 is evenly divided between the Group I and Group II subject. Both JH and WB demonstrated superior gains on 2 out of 4 language areas targeted for intervention. Table 4.14 summarizes the progress observed on more general measures of language production. Although differences are slight, these results seem to favour JH, the Group I child (no individualized component to treatment).

Recognizing once again the difficulties inherent in attempting to compare children using different sets of dependent variables, the above comparison nevertheless seems to provide an accurate representation of the relative progress demonstrated by WB and JH. Certainly, each child exhibited remarkable improvement over the treatment interval. For each child, this improvement extended even to those areas not directly targeted during intervention. On balance, it indeed appears that the progress shown by the two children was about equal, with JH demonstrating slightly larger gains overall.

SUMMARY OF RESULTS

Two major trends emerge from these results. The first can be seen by referring to Table 4.15. The table provides a summary of the dependent variables chosen, and a
<table>
<thead>
<tr>
<th>Pair</th>
<th>Skill Area</th>
<th>Dependent Variables</th>
<th>Child showing more progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1: (DO &amp; MR)</td>
<td>Verbal Communication</td>
<td>1. % verbal communicative attempts</td>
<td>Group II (DO)</td>
</tr>
<tr>
<td></td>
<td>Productive Lexicon</td>
<td>2. MacArthur CDI - raw score</td>
<td>Group II (DO)</td>
</tr>
<tr>
<td></td>
<td>Communicative Intent</td>
<td>3. DO - question responses</td>
<td>Group I (MR)</td>
</tr>
<tr>
<td>#2: (PC &amp; MH)</td>
<td>Verbal Communication</td>
<td>1. % verbal communication attempts</td>
<td>no difference</td>
</tr>
<tr>
<td></td>
<td>Productive Lexicon</td>
<td>2. MacArthur CDI - raw score</td>
<td>Group II (PC)</td>
</tr>
<tr>
<td></td>
<td>Relational Semantics</td>
<td>3. # of relational categories used</td>
<td>Group II (PC)</td>
</tr>
<tr>
<td>#3: (JB &amp; JW)</td>
<td>Relational Semantics</td>
<td>1. JB - Causals</td>
<td>Group II (JB)</td>
</tr>
<tr>
<td></td>
<td>Inflectional Morphology</td>
<td>2. JB - 'ing', JW - 'ed'</td>
<td>no difference</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. JB - copula 'is', JW - 3rd person '-s'</td>
<td>Group I (JB)</td>
</tr>
<tr>
<td></td>
<td>Syntax</td>
<td>4. 'Catenative + Verb'</td>
<td>Group II (JB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. WB - 'V + Obj.', JH - 'Catenative + Verb'</td>
<td>Group II (JB)</td>
</tr>
<tr>
<td>#4: (WB &amp; JH)</td>
<td>Relational Semantics</td>
<td>1. WB - Causals</td>
<td>Group II (WB)</td>
</tr>
<tr>
<td></td>
<td>Inflectional Morphology</td>
<td>2. progressive 'ing'</td>
<td>Group I (JH)</td>
</tr>
<tr>
<td></td>
<td>Syntax</td>
<td>3. WB - 'V + Obj.', JH - 'S + V + Obj.'</td>
<td>Group II (WB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. WB - 'S + V + Obj.', JH - 'Catenative + Verb'</td>
<td>Group I (JH)</td>
</tr>
</tbody>
</table>
progress comparison for Group I and II children within each subject-pair. The reader’s attention is directed to Pairs #1, 2, and 3. On the majority of specified language targets for these 3 pairs, Group II children (individualized treatment component) demonstrated superior gains relative to their Group I counterparts. Only 1 of the 4 pairs (Pair #4) failed to demonstrate this trend. Keeping in mind the modest sample size (only 8 subjects), as well as the somewhat irregular comparison method, these results nevertheless constitute an important finding. Overall, it appears that those children whose parents received individualized support showed greater gains on specific language goals than those whose parents received group instruction alone.

Furthermore, this experimental effect appears to be much stronger for those children functioning at early stages of language development (i.e., vocabulary of 50 words or less, substantial use of non-verbal communication strategies). Clearly, Group I vs. Group II differences were more pronounced in Pairs #1 and 2, than in Pairs #3 and 4.

These two trends warrant careful consideration. They hold important implications for the development and application of parent-centred language intervention programs.
CHAPTER V
DISCUSSION

This study examined the influence of individualized support and attention on the efficacy of parent-centred language intervention. The results indicate that the children whose parents received individualized support and feedback (Group II) made greater gains on specific language goals than those whose parents received group instruction alone (Group I). It seems that an individualized component to parental training had a measurable positive effect on subsequent language development. Furthermore, these effects were most pronounced for the children who were functioning at a lower stage of language development (i.e., productive vocabulary of 50 words or less, primarily single-word utterances).

These findings raise two important questions. First, what did the individualized treatment program (Group II) have to offer that group-training alone (Group I) did not? Second, why should these program differences be especially influential for children at early stages of language learning?

My aim in this chapter is to address these questions, as well as discuss long-term implications for the use and development of parent-centred language intervention.

I. EFFECTS OF INDIVIDUALIZED INSTRUCTION ON OVERALL PROGRAM EFFECTIVENESS

The reader is reminded that the individualized component to intervention occurred
following completion of the group program. What set individualized treatment apart from group intervention was that in individual treatment, the speech-language clinician provided information and advice regarding the specific needs of the child and parent, as opposed to the general needs of the group. This difference was realized in two ways. First, the clinician provided parents with feedback and demonstration regarding their use of language facilitation strategies. Second, the clinician helped parents to select appropriate learning targets for their children, then provided intensive guidance and suggestions as to how these goals might best be accomplished. Both these components seemed to have had an effect on parent and child performance, although to differing degrees.

A. Effects of professional feedback and demonstration to parents: language stimulation strategies

As the reader will recall from Chapter II (Intervention Program), group training afforded many opportunities for parents to practise and receive feedback regarding their use of language facilitation strategies. This feedback and practice was achieved exclusively through role play and group discussion. Only those parents involved in individualized treatment (Group II) were directly observed during interaction with their children and provided with specific feedback from the clinician about their performance.

How did this aspect of individualized training affect parent-performance, and ultimately child progress? As we might expect, there was an impact on parental skill, i.e., proficient use of facilitative techniques. In addition, observation and feedback seems to have influenced a second element of parent performance: parental confidence and self-
assurance.

1. **Parents' use of general language stimulation techniques**

One way to determine the influence of individualized training is to examine parents' use of general language stimulation techniques. Unfortunately, parents' pre- and post-test use of general facilitation strategies were not formally evaluated in this study. Notwithstanding, some comments can be made regarding parental needs and abilities, based on informal observations made during home visits with the Group II families. We can reasonably assume that Group I parents shared similar abilities and concerns.

As stated in Chapter II, in my description of the intervention program, an important aim of parent-training was to foster the use of a non-directive parent interaction style. Parents were to encourage language development by following the child's lead, responding to child-initiations, and employing a number of conversational strategies such as modelling, expansion, and self- and parallel-talk. These methods were identified as language facilitation strategies. It was expected that individualized treatment would help parents hone and develop such skills. As we will see, this was indeed the case for some parents. Other parents, however, seemed to make excellent use of facilitative techniques without the benefit of individualized assistance.

Parents' home use of general interaction strategies were first observed during initial home-visits (i.e., immediately following completion of the 6-week group program). At that time, two parents (WB and DO), had noticeable difficulty employing these general techniques, tending rather to dominate the interaction with questions and commands. These families required considerable feedback and demonstration of basic strategies
during subsequent home visits. The individualized attention and support seemed to pay off: a marked improvement in parental performance was noted within two-three sessions.

In contrast, the two remaining Group II parents (PC and JB) demonstrated such competent and consistent use of the desired stimulation techniques that additional support in this area was unnecessary. For these families, subsequent home visits focused on a different set of issues and concerns, to be discussed later in the chapter.

While two parents became more proficient at general language stimulation as a result of individualized professional input, two other parents had little need of special assistance. Other investigators have reported similar variability in parents' use of facilitative strategies. Cheseldine and McConkey (1979), for example, found that with minimal intervention, three of the seven parents in their study successfully modified their language production in order to teach language to their children. The remaining four parents needed additional help to adopt useful teaching strategies. Rees (1984) also notes that parents show considerable variability in their needs for professional assistance and support.

It seems then, that while there was some benefit to individualized feedback and guidance regarding parents' use of general facilitative strategies, this was not consistent across all families. It is unlikely that improved use of general language stimulation strategies alone can account for the observed Group differences in child language progress.
2. Parents' feelings of independence and self-confidence

As discussed in Chapter II, instilling in parents a sense of confidence and independence regarding their role as language interventionists was considered an essential part of the training process. Following completion of the group program, parent comments indicated that they had indeed gained an understanding and a sense of efficacy with respect to their child's language learning.

Individual programming seemed to further develop this sense of confidence and ability. An interesting example is provided in parents' reaction to video-taped home sessions. One component of the individualized program was that parents were video-taped during two short interactions with their child. These tapes were then reviewed and discussed by parents and the investigator. Regardless of his/her level of competence, each of the Group II parents expressed great enthusiasm and support for this aspect of training. The principal comment was that the exercise helped to demonstrate to parents what they were 'doing right'. Interestingly, in independent and unsolicited comments, three of the four parents who were not involved in individual training remarked that they would have found video-taped observation and feedback helpful. Once again, the principal concern appeared to be whether or not they were doing a good job. These parents seemed be seeking professional reassurance that they were competent language interventionists.

Summary

Individualized feedback to parents regarding their use of language stimulation techniques, along with demonstration and suggestions for improvement seemed to help
Group II families in two ways. First, it assisted in the development of parental confidence and self-assurance. This benefit was observed in all the families examined. Second, individualized treatment helped some parents learn to apply language facilitation techniques more effectively.

One can reasonably conclude from these observations that feedback and demonstration probably contributed in some way to the superior performance of the Group II children. The extent of their effect on the final outcome must, however, be considered in relation to the influence of a second, somewhat more highly emphasized aspect of individualized training: professional guidance in the areas of goal selection and teaching.

B. Effects of professional guidance: specific goal selection and achievement

One cannot talk about selecting and teaching appropriate language goals without acknowledging the difficulty and complexity of this task. Choosing goals for a child requires not only a solid grasp of the nature of language learning and delay, but a thorough understanding of the child's specific communication system. Having selected these language targets, parents must then facilitate their production during natural communicative interactions. This task places considerable demands on the patience, concentration, and imagination of most parents.

Despite the fact that four out of the six group sessions were devoted to goal selection and teaching, it was hardly surprising to find that parents remained highly intimidated by this aspect of language intervention. As a result, specific language targets
became a primary focus of discussion during most individual home visits. What effects did this focus on child-language goals have on program efficacy?

1. Selecting learning goals

To determine the effects of individualized treatment on parents’ choice of language targets, parents in each Group were asked to name the intervention goals they had selected for their children. This information was solicited following final assessment. Parent goals were then compared to language targets selected by the examiner. The results can be found in Table 5.1.

Qualitative differences were immediately apparent between Groups I and II. Most of the Group I parents had difficulty naming specific learning targets for their children, and confessed that although they had selected initial goals during the group program, these had gradually been abandoned in the weeks that followed. Overall, Group I parents identified fewer goals than their Group II counterparts, and tended to focus on general rather than specific targets (e.g., production of longer sentences, increased vocabulary, etc.). Not surprisingly, Group I parents tended to agree less with the investigator’s choice of targets. Furthermore, fewer of the targets chosen by Group I parents evidenced progress over the treatment interval. From these findings, it appears that parents who were given individualized guidance and support were better at identifying and selecting appropriate learning targets for their children.

Careful study of the goals selected by parents leads to a second interesting finding. Performance in this area was found to differentiate families of children at lower stages of language development from those whose children demonstrated more advanced skills.
Table 5.1  Language learning targets selected by parents

<table>
<thead>
<tr>
<th>Child</th>
<th>Parent-selected Goals</th>
<th>Goals showing progress</th>
<th>Goals shared with examiner</th>
<th>% agreement with examiner</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group I</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC</td>
<td>Increase expressive vocabulary</td>
<td>*</td>
<td>*</td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td>Increase use of verbal communication</td>
<td>*</td>
<td>*</td>
<td>(4/5)</td>
</tr>
<tr>
<td></td>
<td>Production of 2-word utterances</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increased use of possessives</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increased use of recurrence</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DO</td>
<td>Increase use of verbal communication</td>
<td>*</td>
<td>*</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Increase expressive vocabulary</td>
<td>*</td>
<td>*</td>
<td>(2/2)</td>
</tr>
<tr>
<td>JB</td>
<td>progressive ‘-ing’</td>
<td>*</td>
<td></td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td>copula ‘is’ and ‘-s’</td>
<td>*</td>
<td></td>
<td>(4/5)</td>
</tr>
<tr>
<td></td>
<td>Pronouns: ‘I’ vs. ‘me’ in subject position</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>‘Noun + verb + noun’</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Catenatives: ‘gonna’, ‘wanna’, ‘hafta’ + verb</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>WB</td>
<td>Increase expressive vocabulary</td>
<td>*</td>
<td>*</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>Action sentences (N + V, V + N, N + V + N)</td>
<td>*</td>
<td>*</td>
<td>(2/4)</td>
</tr>
<tr>
<td></td>
<td>Increase question-asking</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increase length of utterance</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Group II</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Increase expressive vocabulary</td>
<td>*</td>
<td>*</td>
<td>67%</td>
</tr>
<tr>
<td>H</td>
<td>Increase verbal communication</td>
<td>*</td>
<td>*</td>
<td>(2/3)</td>
</tr>
<tr>
<td></td>
<td>Increase intelligibility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MR</td>
<td>Increase expressive vocabulary</td>
<td>*</td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Increase verbal communication</td>
<td>*</td>
<td>*</td>
<td>(3/3)</td>
</tr>
<tr>
<td></td>
<td>Increase commenting</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>JW</td>
<td>Pronouns: ‘I’ vs. ‘me’ in subject position</td>
<td>*</td>
<td></td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Increase length of utterance</td>
<td>*</td>
<td></td>
<td>(0/3)</td>
</tr>
<tr>
<td></td>
<td>Increase expressive vocabulary</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JH</td>
<td>progressive ‘-ing’</td>
<td>*</td>
<td>*</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>Increase pronoun use</td>
<td>*</td>
<td></td>
<td>(1/3)</td>
</tr>
<tr>
<td></td>
<td>Increase use of modifiers</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Goals selected by the parents of PC, DO, MH, and MR (productive vocabulary of 50 words or less, primarily single-word utterances at pre-test) corresponded closely to those chosen by the investigator (85% agreement overall). In contrast, parents’ goals for JB, WB, JW, and JH (the more advanced group) were much less closely matched to those of the examiner (53% overall). Evidently, parents were more likely to choose appropriate communication goals for less-advanced children, than for children at a later stage of language development.

This result is not particularly surprising. Certainly, there seem to be fewer potential targets at early stages of language development from which the interventionist must choose. Those targets that do exist tend to be fairly self-evident (e.g., the obvious aim for a pre-verbal child is to make him/her more verbal). In contrast, children at more advanced levels of language acquisition present with more complex communication systems. As a result, determining the needs and abilities of such children requires sophisticated background knowledge in a variety of language areas, including syntax and morphology. It makes sense that goal selection might present an inherently easier task for parents of linguistically ‘younger’ children.

2. **Facilitating child production of target skills**

Of course, goal selection is only a part of language intervention. Having selected language targets for their children, parents were next faced with the problem of facilitating child progress in these areas. This too proved a very demanding task for all the parents involved. (Once again, observations and comments are restricted primarily to Group II
parents, since these were the families with whom most contact was maintained over the treatment interval.)

Individualized assistance provided help in three main areas: Choosing activities in which the target skill could be easily encouraged and modeled, making target form(s) and behaviour(s) more salient, and maintaining a non-directive interaction style. While parents were responsive to the investigator’s assistance in each of these areas, the last of these, helping parents maintain a non-directive interaction style while facilitating specific goals, seemed most resistant to the efforts of the clinician.

Overall, parents who encountered the greatest difficulty in this area were those working on structural goals (i.e., morphological markers and syntactic structures) with their children. One parent (JB’s mother) complained that maintaining attention to her child’s morphological targets made her much less spontaneous and natural, and that she regularly found herself sacrificing non-directive style in order to elicit target structures. Despite attempts to address these difficulties during home visits, this parent eventually abandoned her work on inflectional morphemes altogether, preferring to concentrate on semantic and syntactic goals, and on general language stimulation techniques.

Other families were more responsive to individualized assistance. One parent for example (DO’s father), initially misunderstood the purpose of goal-oriented activities, and became very directive with his child in an effort to elicit immediate production of a target form. This parent’s performance improved dramatically once he realized that the aim was simply to model the structure and provide frequent opportunities for its use, rather than to insist on the child’s production of the form.
Summary

Parents who received individualized assistance (Group II) clearly had an advantage over their Group I counterparts in the area of language goal selection and teaching. As was evident from parents' performance, as well as their reactions to this task, group sessions alone generally failed to provide them with the skills and knowledge necessary to select the most appropriate learning targets for their language delayed children. Similar difficulties were encountered in parents' attempts to follow through on facilitation of target structures. These difficulties were particularly marked for parents whose children were functioning beyond the two-word utterance stage. Group II parents seemed to benefit greatly from the individual attention received in this area.

This may be the point at which to add an alternative possibility; i.e., that the relevant treatment difference lay not in the quality of intervention, but in the amount of intervention received. Perhaps Group II did better because they simply received more of the clinician's time. Unfortunately, intervention time was not a controlled variable in this experiment. The issue is one that can only be resolved by future research.

C. Focused vs. general stimulation

If we re-define the parent-centred program employed in this study using the terminology presented by Leonard (1981), and Fey (1986), we can see that this program presented parents with two approaches to language intervention: general language stimulation, and focused stimulation.

General language stimulation approaches provide children with concentrated
exposure to language without regard to specific forms or behaviours (Leonard, 1981). This language exposure, by its very magnitude, is often considered more salient and/or functional to the child than that which he/she typically encounters. By this definition, the interaction strategies presented to parents during Sessions #2 and 3 of the group program qualify as general language stimulation techniques. They include such things as non-directive interaction style, and providing language models at the child's level and in the child's world. Although general stimulation procedures have received only weak empirical support to date, some investigators report changes in child utterance length, vocabulary size, and other general measures of language ability following intervention of this sort (Fey, 1986).

Focused stimulation is what occurs at the level of language goals. According to Fey (1986), the key elements of focused stimulation are the following: intervention emphasises a small set of pre-selected goals, is non-directive, involves arranging the context to motivate production of target forms/behaviours, and provides a high density of target forms modeled in a meaningful context. Focused stimulation has proven a successful intervention strategy for a variety of language targets, including lexical acquisition, early two-word combinations, morphological markers, complex verb forms, and complex questions (Fey, 1986). It has been considered an effective approach to language therapy because it focuses on the child's internal processing of meaningful linguistic stimuli, and because of its applicability to a wide range of disorder types and language areas.

Although the individualized program was intended to address both approaches, in
practice, it concentrated primarily on focused stimulation techniques, i.e., helping parents select language targets, and manipulating the verbal and non-verbal context to encourage use of target structures. Considered from this perspective, it appears that the primary difference in the treatment received by Groups I and II lay in the parents' ability to provide focused stimulation for their children. To some degree, then, the study provides a comparison of the efficacy of focused vs. general stimulation approaches. On balance, the children who received more focused language stimulation (Group II) showed better progress overall.

II. EFFECTS OF CHILD LANGUAGE LEVEL ON PROGRAM EFFICACY

Whatever the reasons for differences in Group I and Group II performance, it is clear from the results that differences were especially pronounced for children in Pairs #1 and 2, i.e., children functioning at early stages of language development. Why should the individualized treatment component have had a greater effect on the progress demonstrated by these children than it did on the progress of more linguistically advanced subjects?

Obviously, there were inherent differences in the intervention provided to these two groups (i.e., less advanced vs. more advanced). The principal distinction was in the type of communication goal selected. Target areas for Pairs #1 and 2 included lexical acquisition, use of verbal communication behaviours, and development of communicative intent. Goals selected for the more advanced children were mainly in the areas of semantic relations, inflectional morphology, and sentence-level synax.
From previous discussion, we know that early language intervention targets (i.e., those chosen for the less advanced group) were generally more easily identified and selected by parents than more advanced language targets. We have also established that parents had particular difficulty providing a facilitative context for teaching of structural goals, such as inflectional and syntactic markers, both of which are later-developing target areas. We can conclude, therefore, that the communication targets for the less advanced children were somehow inherently 'easier' for parents than many of the more advanced targets. As Fey (1986) notes, this is not an unusual finding in studies of parent-centred intervention.

At first glance, we might expect parents struggling with difficult goals to benefit more from individualized assistance than those working on more simple language targets. Following this line of argument, it would seem that individualized help should have had a greater effect on the performance of parents in Pairs # 3 and 4 (the more advanced group), leading to a greater treatment effect than that observed for the less advanced children. In actual fact, however, the opposite occurred.

There are two possible explanations for this finding. The first is that more advanced language goals were so challenging to parents, that additional professional input had little impact, whereas difficulties encountered by parents of the less advanced children were easily solved by individualized home visits. A second possibility is that some of the more advanced language goals simply take longer to evidence measurable change. For families working on such goals, differences in child production would be slower to emerge, regardless of the treatment received.
Based on parents’ reactions to individualized treatment, the first possibility seems more likely. It is no accident that it was a Pair #3 parent who felt so constrained by certain goals that she eventually abandoned them. In general, parents of linguistically ‘younger’ children seemed more responsive to suggestions and guidance presented during home visits, whereas the difficulties experienced by parents of more advanced children were more persistent.

III. IMPLICATIONS FOR PARENT-CENTRED INTERVENTION

The results of this study are truly heartening. Regardless of age, disorder type, and treatment group assignment, each child in the study improved remarkably over the intervention period. Of course, in the absence of a control group, it is impossible to say for certain whether these gains were better than what might have occurred without treatment. Nevertheless, it seems likely that intervention was at least a positive influence on development. Parents viewed the program in a similar light; indicating at its completion that they had gained valuable teaching skills and that their children had progressed as a result. The intervention program can be judged successful, if for no other reason than it helped parents to deal more effectively with their children’s difficulties.

The purpose of this study, however, was not to examine the general efficacy of parent-centred language intervention. Rather, it set out to investigate the importance of individualized goal-selection and assistance on the overall effectiveness of parent intervention training. Based on the results, it appears that an individualized component to parent training had a measurable positive effect on both parent performance, and
subsequent child language development.

In light of limited health-care resources and critical service needs, the challenge then, is to determine a cost-effective means of implementing individualized parent-training. How can speech-language clinicians make the most effectively use of parent-centred approaches? Clearly, the benefits to intervention of this type are somewhat dependent on the specific needs and abilities of the families involved. By focusing individualized training on those families who stand the most to gain, we can ensure that clinical energies will be wisely spent.

Individualized parent support serves two main functions:

A. **Improving parents’ use of general language facilitation techniques**

It seems that all parents can benefit from professional feedback and guidance regarding their use of general language facilitation strategies. While many families require little additional guidance in this area, all show gains in confidence and assurance following observation and feedback from a professional. Still others are in need of more protracted assistance in order to develop a more facilitative interaction style.

It appears that any parent-training program should include at least an opportunity for parents to receive direct feedback from a clinician regarding their use of general interaction strategies with their children. Sessions of this type could be used for two purposes: to develop parents’ confidence in their role as interventionist, and as a screening procedure to determine parents for whom more intensive training is required.

B. **Improving parents’ use of focused stimulation techniques**

Identifying and teaching specific communication targets is an aspect of intervention
in which all parents experience difficulty. Certainly, the majority of families can benefit to some degree from individualized support in this area. The families who seem to benefit most, however, from assistance, are those whose children are functioning at the earliest stages of language acquisition (i.e., less than 50 words produced). Such families may show dramatic improvements in both parent and child performance following individualized help. In contrast, children at more advanced stages of language development frequently have difficulties that present special problems for parent-interventionists. While parents working with linguistically ‘older’ children may benefit from individual attention, the effects are much less dramatic. For these families, it may be that some language goals are more efficiently identified and targeted in the clinic, with supplementary parental input and support.

IV. CONCLUSIONS

Parent-centred language intervention offers a highly effective means of addressing the needs of language delayed preschoolers and their families. This study shows that treatment effectiveness can be maximized by providing individualized support and attention to parents. This individualized component seems to work in a number of ways, depending on the particular needs and abilities of the families involved.

Parent-centred treatment has gained considerable popularity and attention in recent years. As this trend continues, a variety of treatment options and programs will become available to speech-language clinicians interested in pursuing this type of intervention. As yet, however, little is known about the relative efficacy of these various options. This
study has investigated the effects of individualized treatment on the success of one such program, albeit using an extremely small group of children. Future research performed on less limited sample sizes is clearly necessary in order to validate these findings. In addition, future research efforts must aim at identifying those factors most essential to the success of parent-centred intervention, and on specifying the children and parents on whom such intervention efforts are best concentrated.
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