

AN ABSTRACT OF THE THESIS OF

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Title: THE RELATIONSHIP BETWEEN SPECIFIC MOTHER-CHILD
INTERACTIONS AND SELECTED ASPECTS OF LANGUAGE
DEVELOPMENT IN HEAD START CHILDREN

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The purpose of this study was to investigate the relationship between specific mother-child interactions and selected aspects of language development in "disadvantaged" children.

The subjects were 19 preschool children in a summer Head Start program in Denver, Colorado. Their ages ranged from four years-nine months to five years-seven months. Eighteen were Spanish-American, and one was Anglo-American. Eighteen out of 19 subjects met the eligibility requirements for the Head Start program in terms of income level according to household size. Each of the subjects attended either a morning or an afternoon session in the same center, under the direction of two different teachers. Due to the teacher variable, the children in each session were matched according to age, sex, and previous Head Start experience and randomly assigned to the experimental and control groups.

The experimental treatment consisted of having the mother spend approximately 15 minutes each day with her child in the home, looking at, reading, and talking about picture story books. Language development was recognized in its broadest sense and was measured by three instruments: the Peabody Picture Vocabulary Test, as a measure of receptive vocabulary; the Templin-Darley Screening Test of Articulation, as an indicator of good and poor articulation; and the Preschool Inventory, as a measure of its four factors: personal-social responsiveness, associative vocabulary, numerical and sensory concept activation. Pre and post tests were administered to the experimental and control groups, and an analysis of variance was applied to the difference scores.

Three null hypotheses were tested: Hypothesis I: Comparison of change scores for the experimental and control groups will yield no significant differences in receptive vocabulary; Hypothesis II: Comparison of change scores for the experimental and control groups will yield no significant differences in articulation; Hypothesis III: Comparison of change scores for the experimental and control groups will yield no significant differences in personal-social responsiveness, associative vocabulary, numerical and sensory concept activation.

Results of the analysis of variance indicated that there were no significant differences between the experimental and control groups. Although there was one significant F-value associated with the

interaction between treatment and sex in numerical concept activation, a great deal of importance could not be attached to it in view of the lack of other significant findings. Therefore, the null hypotheses could not be rejected.

It was concluded that the experimental treatment of having the mothers read to their children was not related to the aspects of language development under consideration in this study.

Supplementary analyses were directed toward a comparison of the morning and afternoon groups with respect to change scores. The student's t-test was applied for each of the seven comparisons and only one, the PSI total score, showed a significant difference at the .05 level. The possibility of tester bias having been operative during the post test sessions was discussed.

A discussion of the findings, the limitations of the study, and suggestions for further research were included. In general, it was suggested that attempting to influence the mother-child interaction in the home in order to stimulate language development is a promising area which needs to be further explored.

The Relationship Between Specific Mother-Child
Interactions and Selected Aspects of Language
Development in Head Start Children

by

Martha-Ann Owen

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The writer wishes to dedicate this study to Miss Debbie Lopez, a young Head Start volunteer, who, due to her gentle understanding of children and her eagerness to devote her time to working with the children at the Elati Head Start Center, helped to make the summer a pleasant experience for all concerned.

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TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
Purpose of the Study	4
Hypotheses and Analysis	5
REVIEW OF LITERATURE	7
Language Development: General Considerations	7
Defining Language Development	7
The Acquisition of Speech	9
Sex Differences	13
The Relationship Between Language and Thought	16
The Role of Auditory Discrimination	19
Ordinal Position	22
The Importance of Mother-Child Interaction	23
The Measurement of Language Development	27
Social Class Indices	31
Specific Studies Showing Correlation Between SES and Language Development	32
The Culturally Deprived Preschool Child in Particular	38
Summary	44
METHOD	47
Subjects	47
Instruments	49
The Peabody Picture Vocabulary Test	49
The Templin-Darley Screening Test of Articulation	51
The Preschool Inventory	53
Procedure	55
Obtaining Cooperation of the Subjects	55
Administration of the Instruments	57
RESULTS	60
Tests of Hypotheses	60
Hypothesis I	60
Hypothesis II	61
Hypothesis III	64

	<u>Page</u>
Summary of Results	66
SUMMARY AND DISCUSSION	67
Summary	67
Discussion	70
Limitations of the Study	74
Limitations in Size of Sample	75
Limitations of Control Over Treatment	75
Additional Limitations	76
Suggestions for Further Research	77
BIBLIOGRAPHY	80
APPENDICES	87

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Summary of analysis of variance applied to the change scores of the experimental and control groups for receptive vocabulary.	62
2	Average amounts of change by sex and treatment associated with analysis of receptive vocabulary.	62
3	Summary of analysis of variance applied to the change scores of the experimental and control groups with respect to articulation as measured by the Templin-Darley Screening Test of Articulation.	63
4	Average amounts of change by sex and treatment associated with analysis of articulation as measured by the TDST.	63
5	Summary of the F-values for the analysis of variance of the four factors and the total scores of the Preschool Inventory.	65
6	Summary of the standard error of the mean associated with the change scores on the four factors and on the total scores of the PSI.	65
7	Summary of the analysis of variance with respect to the four factors and the total scores of the Preschool Inventory.	92
8	Summary of the average amounts of change associated with the analysis of the four factors and the total scores of the Preschool Inventory.	93
9	Mean pretest and posttest scores for the experimental and control groups.	94

Table

Page

10	Individual mean pretest and posttest scores on the Templin-Darley Screening Test of Articulation - averaged from the scores assigned by three judges.
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THE RELATIONSHIP BETWEEN SPECIFIC MOTHER-CHILD INTERACTIONS AND SELECTED ASPECTS OF LANGUAGE DEVELOPMENT IN HEAD START CHILDREN

INTRODUCTION

The summer of 1965 marked the beginning of a new era in early childhood education. The nation, already in the throes of its War on Poverty, announced a new battle plan called Project Head Start. As in most wars, the components involved were not new but rather were newly recognized. Suddenly the attention of the whole country was being focused on the phenomenon of cultural deprivation. Although this term is used alternately with others, such as culturally disadvantaged, culturally different, educationally deprived, and the underprivileged, it is generally agreed that the people so described are disadvantaged in the sense that their experiences in their homes do not transmit the cultural patterns necessary for the types of learning characteristic of the schools and of the larger society (Bloom, 1965; Language Programs, 1965; Larson and Olson, 1963).

Project Head Start, which was designed primarily as an educational, medical and social service program for preschool children and their families, arose out of a need. It was then and is becoming increasingly apparent that many lower class young children entering school for the first time are already at a disadvantage. According to Deutsch (1963), the lower class child enters the school situation so poorly prepared to

produce what the school demands that initial failures are almost inevitable. Although in the first grade we see the smallest differences between socio-economic or racial groups in measures of intelligence, language and some concepts, there is evidence that these deficits are cumulative; hence the differences increase with each year in school (Deutsch, 1963; John, 1963). Consequently, Head Start was created in an effort to intervene early in the life of the deprived child.

Specialists in the behavioral sciences have become involved both directly and indirectly in the area of environmental intervention through working in the programs and through doing research directed toward this problem. In general, results of this research indicate that language development is one of the main areas of deficiency for these children and further, that language development is related to other areas of development, such as intellectual, social, and emotional. Gardner (1964, p. 188) emphasizes how crucial this problem is by stating that "if the environment is threatening and depriving to the child, it is in the area of language development that the effects are most severe and damaging."

A great deal of research on language development is available to the investigators, who are reexamining and reevaluating it in light of current concern with the linguistic deficiencies of disadvantaged children. Since language develops most rapidly during the early years, attention has long been focused on the preschool child (Gardner, 1964;

McCarthy, 1946). Accumulated evidence, as presented at the 1962 international Symposium on Language and the Science of Man, seems to indicate that children are naturally endowed with a predisposition for language learning, that postnatal linguistic growth is largely dependent on differential brain maturation, that language development evolves in a developmental, sequential pattern, and that imitation of adults is very influential in the learning process (Lenneberg, 1964). Between the ages of four and six, the child attains mastery of language; that is, he masters the sound system, basic grammar and vocabulary adequate for communication. However, the disadvantaged child is an exception in that he is found to be "retarded" in his mastery of language (Language Programs, 1965).

The home environment of the culturally disadvantaged child is as much of a concern as the child himself in assessing his development.

The situation in these homes seems to be fairly characteristic:

The size of the family, the concern of the parents with the basic necessities of life, the low level of educational development of the parents, the frequent absence of a male parent, and the lack of a great deal of interaction between children and adults all conspire to reduce the stimulation, language development, and intellectual development of such children (Bloom, 1965, p. 15).

Professionals involved in child development recognize the importance of the "significant people" in the child's environment. More specifically, there is a great deal of evidence that the mother plays a key role in the child's acquisition of language (Gardner, 1964;

Lenneberg, 1964; McCarthy, 1930). Head Start, by policy, indeed recognizes the importance of parents in all aspects of his learning, when it declares that "no one is more vital to the success of the program than the child's parents" (U.S. O.E.O., n.d., p. 7). Therefore, parents are encouraged to participate in various capacities in the program. Paradoxically, however, it appears that in these Head Start programs more emphasis is placed on the educational setting than on parent-child interaction in the home setting. This may be due in part to pessimism about the possibility of helping parents to help their children (Bloom, 1965).

The purpose of this study was to investigate the relationship between mother-child interaction and language development in children. To a large degree, the selection of this focus was dictated by the apparent critical role of the home atmosphere in the disadvantaged child's pattern of language development and the high probability of the mother's influence being a critical and pervasive one throughout that atmosphere.

The Purpose of the Study

The purpose of this study was to investigate the relationship between specific mother-child interactions and selected aspects of language development in "disadvantaged" children. The mother-child interactions, which constituted the experimental treatment, consisted

of having the mother spend approximately 15 minutes each day with her child in the home, looking at, reading, and talking about picture story books. Language development was conceived in its broadest sense and was measured by:

- 1) The Peabody Picture Vocabulary Test -
as a measure of receptive vocabulary
- 2) The Templin -Darley Screening Test of Articulation -
as an indicator of good and poor articulation
- 3) The Preschool Inventory -
as a measure of its four factors:
 - A. Personal-social Responsiveness
 - B. Associative Vocabulary
 - C₁. Concept Activation, Numerical
 - C₂. Concept Activation, Sensory

Hypotheses and Analysis

The design in this study utilized an experimental and a control group and recorded both pretest and posttest scores. The analysis was focused on a comparison of the difference scores from the pre and post test sessions. In comparing the experimental and control groups, the following specific hypotheses were tested:

Hypothesis 1: Comparison of change scores for the experimental and control groups will yield no significant

differences in receptive vocabulary.

Hypothesis II: Comparison of change scores for the experimental and control groups will yield no significant differences in articulation.

Hypothesis III: Comparison of change scores for the experimental and control groups will yield no significant differences in personal-social responsiveness, associative vocabulary, numerical and sensory concept activation.

Each hypothesis was tested using the analysis of variance approach and F-values were generated for tests of sex comparisons, treatment comparisons, and interaction effects.

REVIEW OF LITERATURE

Because of the complexity of the problem under consideration in this study, several different but related areas associated with language development have been reviewed. In general, the review is organized around five major subtopics as follows: language development: general considerations; measurement of language development; problems in defining social class indices; specific studies relating social class and language development; and the culturally deprived preschool child.

In each subsection an attempt has been made to first present general considerations regarding the topic, and then, wherever possible, to relate the topic specifically to disadvantaged populations.

Language Development: General Considerations

Defining Language Development

Operational definitions of language development cover a rather broad spectrum from specific, unidimensional definitions to those encompassing very broad parameters. This lack of uniformity presents a most difficult obstacle in attempts to survey and summarize the literature dealing with language development. In some instances language development is viewed exclusively as vocal expression, to the exclusion of other forms of expression (Davis, 1937; Day, 1932; McCarthy, 1930). Since the disadvantaged child is often found to be

lacking in verbal skills, such a restricted definition may produce a biased assessment of his total language ability. Juxtaposed to this type of definition, however, is the point of view of other writers, Gardner (1964) in particular, that language is the vehicle for all human communication. In the context of this more inclusive definition, he lists the purposes of language as: 1) a means to make wants and needs known, 2) a means for the expression of emotion, 3) a device for gaining information and skill, 4) a means of initiating and maintaining social interaction, and 5) an aid to the achievement of personal identification. This more inclusive definition is perhaps more applicable in describing the language of all children and of disadvantaged children in particular. According to Riessman (1962), the deprived individual is not as restricted by verbal forms of communication as the middle class person. He feels that the culturally deprived child's non-linguistic skills should not be ignored or suppressed, but rather brought out and integrated with verbal communication. In addition, Riessman (1962) has reviewed the findings of the Institute for Developmental Studies, and he reports two of particular significance. One relevant finding is that deprived children seem to understand more language than they speak, i. e. their receptive linguistic ability is more developed than their expressive language. Also of interest is the finding that deprived children express themselves best in spontaneous, unstructured situations. With this in mind, it would seem logical to conclude that in

assessing the language development of the culturally deprived child one should conceive of language in its broadest sense.

The Acquisition of Speech

A complete discussion of the process of the acquisition of speech is beyond the scope of this paper. However, the complexity of such a skill and its role in the present study demand a review of some of the major aspects as viewed by speech specialists. The following brief overview is an attempt to present the principle components of speech and current views of how they are acquired. In particular, reference is made to the notion of "speech readiness," variation in rates of learning and the major tasks of speech development.

The period of "speech readiness" comes at approximately twelve to eighteen months and is dependent upon the maturation of various parts of the speech mechanism as well as structural and functional aspects of the brain (Hurlock, 1964; Lenneberg, 1964). Not only the motor aspects of speech development, but also the mental aspects have been conceptualized differently by specialists in this area. Their conceptualizations vary with respect to the number of components involved, the order of primacy, and the interaction of these components. Perhaps it is this difference of opinion which accounts for the large variety of speech components which have been studied and the broad spectrum of definitions of language development which permeate the

literature. Quite aside from these differences, however, there is general agreement that the pattern of speech development is much the same for all children and seems to parallel the pattern of postural control, which is marked by spurts and plateaus (Hurlock, 1964; McCarthy, 1946).

Rates of learning speech as opposed to the pattern of development, vary in children due apparently to genetic factors and to environmental stimulation. The child learns to use speech through various methods which include trial and error, imitation of a model, and conditioning reinforcement. Associating word meanings with their objects or referents is mainly a conditioned reflex, however, associating a specific meaning with a particular word depends upon the environment in which the child lives (Hurlock, 1964). John and Goldstein (1964) refer to this interaction between meaning and object as the word-referent relationship. Apparently during language acquisition the child's learning of new labels is dependent upon the stability of this word-referent relationship together with the frequency and type of verbal interaction with the significant others in the child's environment. As the stability of the word-referent relationship decreases, the amount of corrective feedback required for acquisition increases. It appears that in the homes of disadvantaged children, a lack of stability of this relationship along with inadequate interaction with others leads to difficulties in the learning of words.

There are four major tasks in speech development which include comprehension, pronunciation, the building of a vocabulary, and the formation of sentences. Despite the interworking between comprehension and verbal responsiveness, Raph (1965) suggests that these are two different functions of language and as such need to be considered separately with regard to facility in lower class children. In every social class and at every age the "passive" vocabulary, or the "understanding vocabulary" as Gardner (1964) prefers to call it, is larger than the "active" vocabulary. According to Gardner, understanding is reaching "an agreement on the meaning of a common experience" (Gardner, 1964, p. 189).

The second task in speech development, the pronunciation of speech sounds, emerges spontaneously as a result of maturation. Imitation of adults plays a major role in defining and refining these speech sounds. After three years the child begins to make great strides in pronunciation. This follows a period between 18 months and 3 years in which there is little improvement in pronunciation. Between 12 and 18 months the child is incomprehensible to those outside of his family. According to Templin's (1953) study of 480 three to eight-year-olds, children in lower socio-economic groups take about one year longer than those in the upper socio-economic groups to reach essentially mature articulation.

The increase in size of the child's vocabulary, the third task of

speech development, is remarkable during the preschool years. In Smith's (1926) early and often quoted study, the average number of words in the vocabularies of 273 children increased from 0 at eight months to 2560 at six years. An interesting finding was that the average total number of words used in conversation increased steadily with age until four years-six months, and then at five years it dropped to the four year level. In addition, a number of studies have reported on parts of speech used, and there appears to be agreement that nouns, verbs, adjectives and adverbs, prepositions and pronouns emerge in speech in that order (Hurlock, 1964; McCarthy, 1930; Smith, 1926; Williams, 1942).

The last major task of speech development is the formation of sentences. The earliest sentences a child uses are made up of one word, either a noun or a verb, combined with a gesture. At two years, the child uses short sentences which are often structurally incomplete. However, by four years of age, his sentences are nearly complete. Thus the percentage of remarks which are functionally complete but structurally incomplete decreases slightly with age, while sentence length increases (Davis, 1937; Hurlock, 1964). The mean length of response seems to be symptomatic of the child's stage of linguistic development and increases most rapidly between 18 and 42 months (McCarthy, 1930). At two to three years of age, the child uses two to three word sentences. Smith (1926) found in her study

a steady increase in number of words to the sentence up to four and a half years, with only small increments of gain after three and a half years, and with a slight decrease from four years-six months to five years. It should be noted that both McCarthy and Smith found social class differences in favor of the upper classes.

Thus speech acquisition is an intricate process involving both maturation and learning. The literature indicates that the greatest development in language occurs between conception and three to four years. At the same time, some studies suggest that disadvantaged children may be delayed in reaching linguistic maturity.

Sex Differences

Perhaps the most definitive statement regarding a professional view of sex differences in language development comes from McCarthy's (1946) review of language development in children. She states that

One of the most consistent findings to emerge from the mass of data accumulated to date on language development seems to be a slight difference in favor of girls in nearly all aspects of language that have been studied. Whenever groups of boys and girls are well matched in intelligence and socio-economic background, and when the situation in which responses are recorded does not tend to favor the interests of one sex or the other, there appear slight differences in favor of girls. Whenever such sex differences fail to appear, or in rare instances are reversed, the results can nearly always be accounted for, when the data are available, in terms of selection on the basis of one of the aforementioned factors (McCarthy, 1946, p. 551).

This general attitude has apparently been pervasive for some time in that as early as 1930 "expected" differences in favor of girls

were reported. For example, McCarthy's (1930) study of language development of preschool children revealed sex differences in favor of girls with respect to mean length of response. The following quotation from McCarthy's discussion is an interesting reflection of the strength of professional expectations of the times:

... in accordance with the findings of most other investigators ... this study reveals sex differences in favor of the girls which, though slight, are consistently in the same direction. In view of the consistency of these differences from one age level to another, their relationship to similar differences in the other analyses, and their agreement with reports of other investigators, they should be considered as suggestive, and possibly significant, even though they do not meet the statistical criterion of the significance of a difference. It will be seen ... that the differences are greater in the younger age levels at the time when the curve shows the most rapid rise, and that they are less marked in the older children, when development is slower. It seems to indicate that the girls go through the developmental cycle more rapidly than do the boys, but that the boys practically equal them at the close of this rapid developmental period (McCarthy, 1930, p. 55).

In general, this finding has been well supported in subsequent research. Day's (1932) study of the language development of two to five-year-old twins contained a replication of McCarthy's method of observation and analyses. Even with twins, she found the expected sex differences in favor of the girls in all methods of analysis. However, the differences between twin boys and twin girls were not as great as in the case of McCarthy's boy-girl comparisons of singletons. She suggested that this was due possibly to the social factor, i.e. the twins' interaction with each other, which has been demonstrated in other research.

Davis (1937) also studied the linguistic skills of twins and, for a greater range of comparison, included in her sample singletons with siblings and only children. Her subjects ranged in age from five to ten years. She found the articulation of girls to be superior to that of boys and the length of sentence to be slightly greater for girls. However, at each age twin boys used longer sentences than twin girls, and whereas twin boys were not appreciably inferior to only children and to singletons, twin girls were 9 to 24 months "retarded" in length of sentence.

More recently, Thomas (1962) has presented interesting and in part contradictory results after collecting speech samples from 50 Negro and 50 white kindergarten pupils from low socio-economic urban areas. He analyzed for length of sentence, type of sentence structure, parts of speech, grammatical errors and vocabulary. The whites did not show sex differences, while the Negroes showed evidence of some sex differences. Also when sex comparisons were made within the Negro group, it was reported that the boys tended to be more accurate, while the girls tended to speak in longer sentences. These results are especially interesting in that they do not entirely support McCarthy's (1946) observation that researchers have agreed in finding the sex differences more marked among children of lower socio-economic status than among those from upper socio-economic levels. She indicated that this might seem to point to an early differential effect of

the environment on the two sexes as revealed in linguistic development.

Thus it appears that investigators must be cautious in forming conclusions about sex differences and that precision is required in identifying the language variable under consideration. Research findings suggest that sex differences in language development, although rather consistently significant in favor of girls, are complex and may reflect differences in motivation and training as well as in maturation and sex (Peisach, 1965).

The Relationship Between Language and Thought

A relatively new area of interest in the study of language development is the relationship of language to thought. According to Luria (1961), intellectual activity is a complex developmental process which is formed in the course of the child's speech and is based on social relationships. Hess (1965) summarizes much of the thinking in this area in stating that the structure of the social system and the structure of the family shape communication and language and that language shapes thought and cognitive styles of problem-solving. In discussing the "structure of the family," Hess is referring to "the nature of the control system which relates parent to child" (Hess, 1965, p. 870). Drawing from the work of Basil Bernstein, he discusses two forms of communication codes or styles of verbal behavior: he calls the first "restricted," a style which is characteristic of the lower

class, and the second "elaborated," a style found more often in the upper class. He concludes that

... the meaning of deprivation is a deprivation of meaning - a cognitive environment in which behavior is controlled by status rules rather than by attention to the individual characteristics of a specific situation, and one in which behavior is not mediated by verbal cues or by teaching that relates events to one another and the present to the future (Hess, 1965, p. 885).

A number of investigations focusing on the relationship of language development to cognition are generating from the Verbal Survey project at the Institute of Developmental Studies of the New York Medical College. Included in the sample were 292 first and fifth grade children from various racial and social class groupings. In reviewing the findings of the project, Raph (1965) submits Deutsch's conclusion that the "cumulative deficit effect" does exist, in that children with minority status from low socio-economic backgrounds become less able to handle intellectual and linguistic tasks as they move through school.

In seeking to understand the relationship between language and thought, there seems to be a common tendency to concentrate upon the interaction between language and "intelligence," and even more specifically, on the interrelatedness of language and "I. Q." This convergence upon specifics is understandable, especially in those programs dealing with disadvantaged children, in which an effort is being made to delineate the children's deficiencies in order to provide effective intervention. However, in attempting to describe the

connection between language and intelligence, one encounters many problems and a great deal of controversy due largely to semantics. There is no universally accepted definition of intelligence or "I. Q." and no clear cut agreement as to how it relates to language.

Many writers agree that early speech is an index of mental precocity, but that, conversely, late speech is not an index of mental retardation (McCarthy, 1960). At the same time, others state that the ability to acquire language is a biological development that is relatively independent of intelligence (Lenneberg, 1964).

Measuring intelligence thus becomes a difficult task. A variety of approaches have been advanced by different writers. Luria (1961) quotes Vygotsky in saying that assessing a child's intellectual abilities is an "investigation of the child's zone of potential development" (Luria, 1961, p. 41). Eells (1953), on the other hand, defines intelligence as problem solving ability and says that we need new, good tests of basic problem-solving ability. It has also been suggested that I. Q. is the most variable during the preschool years, and that I. Q. tests are measures of attainment within the limits of whatever skills the tests measure rather than measures of human potential (Language Programs, 1965). In any event, current objective measures of intelligence given at very early ages are less reliable than those given during the school years. There is evidence that the correlation between tests given during the preschool years and at

subsequent ages, decreases as the length of time between tests increases (Gardner, 1964).

Despite the difficulties involved in defining the terms, most writers seem to agree that skills in language and conceptualization are crucial to academic achievement, and that disadvantaged children are normally the most severely retarded in these skills (Language Programs, 1965). According to Eells (1953), at least a substantial part of the known group differences in I. Q. of children from different sub-cultural groups may be accounted for by cultural bias in the intelligence tests. Although he differentiates between a "culture fair" test as opposed to a "culture free" test, he goes on to say that cultural bias is irrelevant if one is interested in "intelligence" as a predictor of school success. He also adds a note of warning against overgeneralization of intellectual abilities by pointing out that there is a wide variation of ability within each social class group.

Thus, research leads to the implication that the interrelationship between language and cognition is vital and must be further explored in order to understand the deficits of disadvantaged children.

The Role of Auditory Discrimination

An extremely important factor in verbal behavior is auditory discrimination (Deutsch, 1964). According to Wepman (1960), auditory discrimination is the capacity to distinguish between phonemes

used in speech. This ability to discriminate between individual sounds develops rapidly in some children and more slowly in others and involves sequential development on three levels: acuity, understanding, and discrimination and retention. According to auditory discrimination theory, the following statements are tenable:

1. Individuals differ in their ability to discriminate among sounds.
2. The ability to discriminate frequently matures as late as the end of the child's eighth year.
3. There is a strong positive relationship between the slow development of auditory discrimination and inaccurate pronunciation. Of children with articulatory substitutions in speech, only 20% have hearing, psychogenic, intellectual, or structural defects, while 80% are lacking in auditory discrimination.
4. There is a positive relationship between poor discrimination and poor reading.
5. There is little if any relationship between the development of auditory discrimination and intelligence as measured by most intelligence tests.

The discrimination of one sound from another presupposes normal receptive sensory apparatus, but beyond this, variables having to do with experience and exposure to adequate stimuli are needed

(Deutsch, 1964). The crucial time for learning auditory discrimination, according to Deutsch, is before the first grade, although according to Wepman, as cited above, this would seem to be an "optimal" rather than a "critical" period.

An implication of the studies done at the Institute for Developmental Studies, comparing first and fifth grade children, was that conditions under which children live, particularly early in life, affect auditory skill in a predictable way (Deutsch, 1964). This finding seems to have been born out in Clark and Richards' (1966) study involving 58 Head Start children. Half of the children met the criterion for being economically disadvantaged, according to family size and income level, while the other half were non-disadvantaged. When compared on Wepman's Auditory Discrimination Test, the non-disadvantaged group made significantly fewer errors than the disadvantaged group at the .001 level of significance. They concluded that preschool economically disadvantaged children exhibit significant deficiencies in auditory discrimination ability when compared to the non-disadvantaged group.

These findings were further substantiated by Stern's (1966) report on the Early Childhood Language Program, a five year project supported by the Office of Education at the University of California at Los Angeles. In a study involving 131 subjects, 63 from middle class nursery schools and 68 from Day Care centers, the middle class children

were significantly superior to the disadvantaged on the Wepman Test. In addition she indicated that whereas middle class children can be expected to improve appreciably with time, no such improvement accompanies the development of deprived children and suggests that this is another way in which cumulative deficit is demonstrated.

Among the correlations reported by Deutsch (1964) between the Wepman Auditory Discrimination Test and tests of other abilities, there were few high values. However, all that were significant related the Wepman score to some verbal ability. One interesting and seemingly contradictory finding was that in the first grade sample, the correlation between the Wepman and the Peabody Picture Vocabulary Test was significant. Deutsch explained this result in saying that

The PPVT is also an intelligence measure, but one which uses verbal behavior, while the Lorge-Thorndike form at this level is non-verbal. Here, then, we may be confirming what was previously noted: the Wepman correlates with verbal measures, but not with non-verbal or performance ones (Deutsch, 1964, p. 286).

It seems evident that in assessing children's verbal behavior, auditory discrimination is a crucial factor which must be considered. Moreover, it is a necessity for any preschool program directed to lower-status children to include training in auditory discrimination (Deutsch, 1964).

Ordinal Position

The literature indicates that ordinal position in the family is also

related to the child's language development. McCarthy (1930) found that children who associate with adults only have an advantage in the length of sentence. Because of this finding, Davis (1937) included a group of only children in her study, making it the first language study which treated the only child as a separate entity. She found that only children were superior to twins and to singletons with siblings in the mean length of response. The articulation of twins at five and one half was markedly inferior to only children and to singletons with siblings.

The Importance of Mother-Child Interaction

There has been a great deal of emphasis on the primary role of the mother-child relationship in language development. However, it is difficult to test the specific influence of that relationship (Cazden, 1966). It may be that the lower socio-economic status itself is not causally related to poorer speech among children of lower classes; those concomitant patterns of family life which are more prevalent in lower socio-economic groups may instead be the more important factors (Cazden, 1966; McCarthy, 1954).

Several studies concerned with this problem have been conducted in orphanages, hospitals, and other institutions. In Brodbeck's (1946) study a group of orphanage infants, one day to six months in age, were compared by type and frequency measures of speech behavior with

family infants of the same age range. The means of the orphanage children fell below the family children's means at all age levels and for both type and frequency measures. The possibility of attributing the results solely to the selection of orphanage infants from the lower social status groups was ruled out by breaking down the family infant data into professional and unskilled family groups and again comparing it with orphanage infants. The orphanage means deviated from the means of both family groups several times more than did either of the two occupational groups deviate from each other.

In another study (Rheingold and Bayley, 1959), 16 children who had been cared for in an institution for the first nine months of life were divided into experimental and control groups. The experimental group was cared for solely by one person for seven and a half hours per day, while the controls were reared under the institutional routine. The experimental subjects were more responsive to the experimenter and to other persons than were the controls, but they did not score significantly higher on the Cattell Infant Intelligence Scale or on tests of postural development and cube manipulation. At the conclusion of the study, the experimental group was again placed under the full-time care of the institution. Eventually all the babies were placed in homes, either their own, adoptive, or boarding homes. One year after the study, when the infants were 18 months of age, 14 of them, 7 from the experimental group and 7 from the control group, were relocated to

assess possible effects of the earlier treatment. A social test showed no significant differences, and there were no differences in intelligence. However, when vocalizations were analyzed separately, the experimental group vocalized more (statistically significant at the .05 level). The experimental subjects also had larger spoken vocabularies, although this result was not statistically significant. The experimenters concluded that verbal behavior of young children is more sensitive to changes in the environment than are other classes of behavior.

Goldfarb (1945) reported another study using 15 three-year-old children in an institution, who were about to be placed in foster homes. These children were matched with a group of children with continuous foster home experience. A series of tests, including language tests, was conducted on the institution children while they were still in the institution and then after they had been in foster homes for seven months. Among the results was the indication that language deficiency of the institution children was a specific factor retarding them. The findings strengthened the hypothesis that extreme psychological deprivation in infancy produces a lag in mental growth which is maintained even under new conditions of enriched stimulation.

Other studies, dealing more specifically with the lower socioeconomic groups, have uncovered information relevant to the importance of mother-child interaction. In a study on the influence of selected home background variables on the development of oral communication

skills in eleven-year-old children, Marge (1965) found that the extent of reading to the child at age four or five was positively correlated beyond the .01 level with Language Maturity in the Speech Examination. This variable was also positively correlated with General Speaking Ability as assessed by the children's teachers. She inferred that the practice of reading to the child in the early years has a positive influence on the attainment of mature language behavior.

Pavenstedt (1965) differentiated between two extremes of the lower class. She found that in the upper-lower, or the "stable group," there were no books but that the mothers talked to their children from an early age. Their response to and encouragement of vocalizations were frequent but not always present. The children's language development fell in the normal range according to various tests: Gesell, Merrill-Palmer, Binet, and Wechsler Intelligence test. However, in the homes of the lower-lower class children, verbal interaction was almost non-existent. The children in this group, which she referred to as the "disorganized group" formed words so poorly that they were almost impossible to understand at three and four years of age. Words were used imitatively and often out of context. These children reflected a poor self-concept and researchers observed numerous instances of self-devaluation.

Drawing on data from a larger study of verbal and intellectual development of 250 first and fifth grade Negro and Anglo children,

Keller (1963) investigated the social and family background of the Level IV families, who according to the Index of Social Class were at the top of the lower-lower class and at the bottom of the upper-lower class stratum. Through questionnaires to parents, children's accounts of their activities and through home interviews, she found that these families did not read in their homes and that there was a lack of sustained interaction between the children and the adult members of their families. Low self-esteem was typically expressed by the children, and Keller suggests that this was one potential source for early school failure. However, she found that, in general, the parents were optimistic about the future and had high hopes for their children's success in school and in their careers.

The role of the mother-child relationship in language development thus appears to be a principal one. However, there are very real differences in patterns of mother-child interaction among social classes which are, at this point, understood only in the most general terms (Walters, Connor and Zunich, 1964).

The Measurement of Language Development

Linked with the problem of defining and describing language development is the difficulty of measurement. The literature indicates that there is no single index of overall language development (McCarthy, 1946). As a result, research has sought to measure

dimensions such as mean length of response, parts of speech, growth of vocabulary, amount and rate of talking, articulation, construction of response, and function of speech.

In spite of the various indices which have been utilized, most sources seem to agree that the most reliable measure of linguistic maturity is the mean length of response (Gardner, 1964; Lenneberg, 1964). It has been cited as the most reliable, easily determined, objective, quantitative and easily understood measure of linguistic maturity (Cazden, 1966; Lenneberg, 1964; McCarthy, 1946). However, this seems to be due, at least partially, to a lack of alternatives.

Aside from mean length of response, perhaps the most widely used index of language development is "functional analysis." The concept of functional analysis was originally conceived by Piaget and was based on his observations of two six-year-old boys at the Maison des Petits de l'Institut Rousseau. He made a division between "ego-centric speech" and "socialized speech" and found that egocentric speech constituted half of spontaneous language. According to Piaget, speech serves to accompany and reinforce individual activity before it can be used to socialize thought.

Since its conception, Piaget's "functional analysis" has been used by numerous investigators in its original formulation as well as in a modified form developed by McCarthy (Anastasi and D'Angelo, 1952; Davis, 1937; Day, 1932; McCarthy, 1930). Modifications of the

classification were made necessary by the different circumstances under which McCarthy (1930) made her observations, by the use of much younger subjects, and by the desirability of subdividing some of the larger categories for a more detailed analysis.

Despite its popularity, "functional analysis," like other measures of language development, is limited in its usefulness. In a recent study Raph (1965) indicated that there was a need to develop procedures which would enable researchers to investigate various modes of verbal functioning and adaptation employed by the child, including attention to his language in the context of his activities with his peers. The gesture accompaniments of his talking should be studied, suggesting the possibility of combining narrative and descriptive methods of describing total behavior with the use of mechanical recording devices.

At the present time such a measure of verbal functioning is not available. However, one instrument which is available, and which has some unique advantages, is the Peabody Picture Vocabulary Test (Dunn, 1965). The PPVT provides an estimate of a child's verbal intelligence through measuring his hearing vocabulary and has been used fairly extensively with disadvantaged children. One reason for this is that in measuring "receptive" or "understanding" vocabulary, the PPVT is sensitive to the assumed nonverbal strengths of these children, rather than highlighting their deficiencies in verbal ability. Regardless, DiLorenzo and Brady (1968) state that marked weaknesses

in the I. Q. tables at the preschool age level seriously limit the use of the Peabody with disadvantaged preschool children. They advance four specific limitations:

- 1) The norm tables are divided into large, six month age intervals. Gross I. Q. differences separating adjacent age groupings are unrealistic in comparing children who are so close in age and intelligence.
- 2) There are sizeable discrepancies between the PPVT I. Q. scores and those of other established tests of intelligence.
- 3) A lack of comparable growth is required to move from one age level to another.
- 4) Changes on either side of the norm are not comparable.

It is further asserted that the limitations become most apparent in the evaluation of programs for disadvantaged preschoolers, where an attempt is made to measure changes over a limited treatment period. It is difficult to determine whether significant differences between compared groups are valid results of the program treatment or are artifacts of the I. Q. conversion tables. One suggestion for neutralizing the limitations is to use raw scores in the analysis rather than I. Q. scores. Despite these limitations, Lyman (1965) states that the Peabody Picture Vocabulary Test is a "highly usable test" (Lyman, 1965, p. 530), in that it is attractive, interesting to most subjects, and simple to administer and score.

It would seem, therefore, that at present there is no single measure of language development which is adequate in itself. Moreover, not one seems to do justice to the overall function of language, as previously stated, as a dynamic, communicative process.

Social Class Indices

Determination of the social class standing of the child and his family is another difficulty encountered in reviewing the literature on the language development of the deprived child. Since the studies which were reviewed utilized various indices, one has to be somewhat cautious in drawing parallels from one study to another and in making inferences about all culturally deprived children.

Irwin (1948a), in his study on infant speech, considered only occupational status in dividing his subjects into two social class groups. One of his groups consisted of infants from homes of laboring families and the other from homes of business, clerical, and professional families.

Other studies, such as John's (1963), have used the Index of Social Class, developed by Keller and Cherry at the Institute for Developmental Studies. In this index, three criteria are established:

- 1) the occupational status of the main breadwinner, which is similar to the Empey Scale of Occupational Prestige;
- 2) the education of the main breadwinner;

3) the person-to-room ratio of the family.

Weights assigned to the indicators were derived from a regression equation based on the degree of intercorrelation among these three variables. In order to classify a child into one of the three social class categories, the necessary information is elicited from the child and then further verified by a questionnaire mailed to the parent.

Another index is W. L. Warner's Index of Status Characteristics (ICS), which is the one used by Milner (1951). In this index, the ICS ratings are determined according to the occupation, source of income, and education of the breadwinner.

The family income level, according to household size, is the criterion used in establishing the eligibility of a child for Project Head Start. Ninety percent of the children in a Head Start center must be from families who meet the specific income requirements. For example, a non-farm household of four persons must have an income of \$3,000 or less to be admitted to the program (O. E. O., n. d.).

Thus it appears that all the indices which have been cited have some characteristics in common. At the same time, however, they differ in their degree of intricacy and sensitivity to social class variables.

Specific Studies Showing Correlation Between SES and Language Development

McCarthy's (1930) study of the language development of preschool

children, followed by Day's (1932) and Davis's (1937) studies have been referred to at numerous points in this review of literature, since they are classics in this area of inquiry. Here again they are called to the attention of the reader, because they were among the earlier studies which indicated socio-economic differences in language acquisition. These differences were found in such specific areas as vocabulary, mean length of response, articulation, structure and function of sentences. A number of studies since that time have used them as a basis and in general have continued to support their findings.

Two studies done by Irwin (1948a, b; 1960) illustrate the relationship between the family's socio-economic status and the child's linguistic development. In the first study, Irwin (1948a, b) observed two groups of infants with the purpose of considering the effect of two variables, the parental occupational status and the age of the child, on the development of phoneme types and on the frequency of utterance of speech sounds. The analysis of variance yielded F-ratios indicating significant differences between the two groups. The occupational component, although negligible during the first one to one and a half years of age, proved to be highly significant during the last year of infancy, one and a half to two and a half years.

In a later study, Irwin (1960) hypothesized that in the homes of working families the systematic reading of stories to infants between 13 and 30 months of age would increase the amount of phonetic

production. Thirty-four subjects were used, 24 in the experimental group and 10 in the control group. The mothers in the experimental group were instructed to spend 15 to 20 minutes per day reading stories to their children from illustrated children's story books, so that the children's speech sound environment would be enriched. The mothers were to point out the pictures in the books, to talk about them, and to make up original, simple tales about them. Frequent consultations were held with the parents, and two or three books were brought into the home during each two-month period. Every two months, the children in both groups were visited, at which time the spontaneous speech was recorded by paper and pencil in the international phonetic alphabet. The amount of vocalization was then assessed as measured by the total phoneme frequency of all types. The results showed that between 13 and 17 months there was little difference between the experimental and control groups. Then, however, the curves separated and the means for the experimental group consistently exceeded those of the control group. All differences were significant at or beyond the .05 level (except between 21 and 22 months of age).

Two other recent studies are of interest in examining the interaction between socio-economic status and language development. John (1963) compared first and fifth grade Negro children from three social classes on two aspects of intellectual development - the first, selected features of verbal behavior including descriptive and

integrative language; the second, the use of language as a conceptual tool as in classificatory behavior. Significant differences were not found at the grade one level but were found at the grade five level. Middle class children surpassed their lower class age mates in possessing larger vocabulary (WISC Vocabulary results) and a higher nonverbal I. Q. (Lorge-Thorndike), in their ability to produce a best-fit response (Verbal Identification, Integrative section), and in their conceptual sorting and verbalization behavior. Children from lower class homes were observed to use shorter sentences, more limited vocabulary and poorer articulation. John concluded that the differences were partially due to the more restricted nature of the environment in which children from lower class homes were raised. He went on to say that whereas motor exploration can be perfected by the child on his own, language as an effective internal process can only be learned from others. The lower class child experiences the hearing of a word and the seeing of an object, but his own first attempts at talking may go unrecognized. If the infant is to learn the skill of words, he needs the presence and active assistance of another speaker. Another interesting aspect of this study is John's use of the Peabody Picture Vocabulary Test with the first grade children as a measure of "receptive vocabulary."

Patterns of parent-child interaction are examined even more specifically in a study done by Milner (1951) using first grade children

as her subjects. Since the "language factors" subtests of the California Test of Mental Maturity taken together closely approximate tests of reading readiness, Milner used the children's scores on these subtests to determine their "language I. Q. " scores. Subsequently she divided her subjects into two groups, the 21 high scorers constituting one group, and the 21 low scorers constituting the other. Each of the 42 children was interviewed individually and privately according to Interview Schedule II which contained 13 questions. Concurrently, the parents were interviewed in their homes using three different Interview Schedules to gain information concerned with home routines and child-training practices. The responses to each of the questions on these schedules were tallied, categorized, and then grouped according to whether the child responding was a high or low scorer, the mother responding was the mother of a high or low scorer, and according to two social class groups, lower and middle. The hypothesis of no differences between language I. Q. score and social class was systematically tested for every set of responses through the application of the chi-square analysis. At least one question in each interview schedule proved to be discriminating in that significant differences were substantiated at or beyond the .05 level. The relationship between the family's ISC (social class) ratings and the child's "language I. Q. " correlated, yielding a Pearson r of .86 and a rho of .784. Milner concluded that the high-scoring children were

surrounded by a much richer verbal family environment than the low-scoring children. The former had more books available to them and were read to by personally-important adults. Also there appeared to be a radically different atmosphere around the meal table. For example, the responses of some of the mothers of low scorers indicated that they actively discouraged or prohibited children's "chatter," whereas those of the mothers of high scorers suggested rather an atmosphere of total family interaction. Milner stated that upon entering school the lower class child of this study seemed to lack two things as compared with the middle class child of the study:

1. A warm positive family atmosphere or adult-relationship pattern which is more and more being recognized as a motivational prerequisite for any kind of adult-controlled learning, not only of the verbal skills.
2. An extensive opportunity to interact verbally with adults of high personal value to the child and who possess adequate speech patterns (Milner, 1951, p. 111).

One of Milner's specific suggestions was that "extensive opportunities to leaf through, explore and ask questions about briefly-captioned picture books depicting objects and situations close to the child's experience should be provided" (Milner, 1951, p. 112). However, all her suggestions were aimed at the school rather than at the home.

Thus it appears that the literature from as early as 1930 has been substantiating the finding that there are social class differences in some specific aspects of language acquisition, such as phoneme types and frequency, the structure and function of sentences, the extent

of vocabulary, and the length of response. The family environment and, in particular, the verbal interaction between the child and adequate speech models have been focused upon as crucial factors when considering the interrelationship between socio-economic status and language development.

The Culturally Deprived Preschool Child in Particular

Even though the literature on the language development of the culturally deprived contains frequent reference to the infant and the preschool child, there is a relatively greater wealth of data on elementary school children. These data illustrate the "cumulative deficit" aspect previously described.

There is, however, an interesting study by Rieber and Womack (1968) recently published in Exceptional Children. A group of 568 Negro, Latin American and Anglo preschool children, with an average age of five years and seven months, who were enrolled in a summer Head Start program, were the subjects. Using the Peabody Picture Vocabulary Test, the children were tested at the beginning of the program using the two alternate forms of the test. There was no reliable way of determining what the primary language of the children with Spanish surnames was, so all of these children were tested with both the English versions of the test, using alternate forms. One-fourth of the group, 131 subjects, was retested after five weeks by

the same tester, but with each child using the alternative form of the PPVT. In this study the researchers were interested in the correlation between the PPVT's measure of I. Q. and the family's social class. The authors indicated that the extent to which the children were found to be deficient in verbal skills was rather striking. For example, they report that the average I. Q. fell as much as 50 points below the norms. In terms of raw scores, all three groups made statistically significant gains. It was concluded that test-retest results indicated that the experience offered by the Head Start program had a marked effect on the intellectual development of these children; and that at least one of the causes of their retarded intellectual development could be attributed to a lack of stimulation by the appropriate experiential situations. It may be that Rieber and Womack are overgeneralizing in stating that the program had a marked effect on the intellectual development of the children. They seem to view the PPVT as a measure of general intellectual development, rather than regarding it as primarily a measure of receptive vocabulary. They are also lax in defining what they mean by "intellectual development."

In abstract form, Kowles (1967) reports his evaluative study, undertaken to determine whether disadvantaged Negro and Caucasian preschool children differed in developmental characteristics classified as social, cognitive, perceptual, and psychological. A total of 368 Caucasian and Negro children, enrolled in an eight week summer Head

Start program in Portland, Oregon, were tested using six instruments. These included the Behavior Inventory, the Preschool Inventory, the Psychological Screening Procedure, the Stanford Binet, Perceptual Drawings, and Developmental Charts. The first three instruments were available through the Office of Economic Opportunity. The last two were developed by Kowles. Of interest here is his report that sex differences in performance were found in the area of concept development. In addition, he reports that females were more adept in naming colors and were superior to males in number concept.

Stern's (1966) report on the Early Childhood Language Program in Los Angeles has been previously mentioned in the subsection of this review which deals with auditory discrimination. A second aspect of this study concerned the assessment of verbal output. Pictures relating to Vera John's 1964 item analysis of the PPVT were shown to the children, who were asked to label the objects, to describe the action, and to produce a meaningful story. The Peabody Picture Vocabulary Test and the Goodenough Draw-A-Man Test were also administered to the children. The middle class children consistently scored high on verbal output and on the Peabody Picture Vocabulary Test, whereas the deprived children had low scores on both of these tests. A similar relationship was found between the two groups on the Goodenough Draw-A-Man Test and verbal output, although no correlation coefficient was given. The writers found these results surprising, in

light of findings in other research which intimate that the deprived child, while deficient in speech, is often superior in nonverbal skills.

A recent publication distributed by an ERIC Clearinghouse, entitled "Cornell Story Reading Program" (Macklin, 1968), describes a program sponsored by the Cornell Research Program in Early Childhood Education, under the direction of Dr. John Harding. The purpose of the project is to study the language development of disadvantaged children and to assess the effects of reading books to these children systematically and over an extended period of time. Children selected for the research project were between one and a half and two and a half years of age. Fourteen-year-old Negro and white school girls from working class homes were selected to read to the children every day in their homes. The booklet is purely descriptive and does not indicate the size of the sample, how the children were selected, when the study began, or whether or not any results are available at this time. This writer was very much interested in the project, since it seems to closely approximate the study done by Irwin (1960) with the innovation of having adolescent girls, rather than the children's mothers, doing the reading. Although a letter was sent in an effort to obtain more information, there was no reply.

In general there is a lack of research on the culturally deprived preschool child. In the studies which have been done, there are very few findings which differentiate between the language development of

various racial groups and almost no evidence as to how the racial differences relate to socio-economic groupings. Some evidence indicates, however, that social class is a more relevant factor than race (Peisach, 1965). On the other hand, Rieber and Womack (1968) found in their study that Latin American children scored a great deal lower than Anglo and Negro children. More studies have compared Negro and white children than have contrasted Spanish-American children with either of the other two groups. This seems to be due in part to public interest and partly to the difficulties in describing the Spanish-Americans as a group, since their culture and the Spanish language are variables which tend to foster their heterogeneity as well as their homogeneity.

Until recently research done in Project Head Start was housed in the Office of Economic Opportunity and was apparently unavailable to interested students. However, in Spring, 1969 the Educational Resources Information Center, ERIC, of the National Laboratory on Early Childhood Education issued Volume 1 of the Head Start Childhood Research Information Bulletin (O'Donnell, 1969). CRIB contains selected abstracts of research done in Head Start from 1965 to 1967. Since the original studies are available only in microfiche and in hard copy from the ERIC Document Reproduction Service in Bethesda, Maryland, this writer decided it would be unrealistic economically to purchase the original documents.

One abstract of interest was a report by Friedlander (1965) on the articulatory and intelligibility status of socially disadvantaged preschool children in a Head Start program. There were 150 subjects, four and a half to six years of age, with equal numbers of boys and girls. The group was composed of children from families with Spanish language background, from Negro families, and from native white families. All children were tested with the Templin-Darley Diagnostic Test of Articulation. A taped conversation with each child was used for evaluation by an independent group of examiners in the areas of intelligibility, verbal proficiency, foreign accent, regional accent, and articulatory defects. Family data on occupation, income, family size, and languages spoken and a sampling of parent articulatory level were obtained. This data was correlated with the articulatory and intelligibility level of the children tested. The data indicated that all groups were minimally proficient in intelligibility and verbal performance. White children showed greater articulatory maturity than the Negro and Spanish-language children. Factors shown to be of no influence were sex of child, occupation and income of father, and foreign language background. The author concluded that poor articulation performance reflects a developmental lag in articulatory growth and suggested that new testing instruments which allow for ethnic differences in articulation should be developed for future study.

In another CRIB abstract, Johnson (1965) reported on a study

which sought to determine whether significant differences existed in skill performance as a result of Head Start experience and to determine whether these differences existed between two ethnic groups. Culturally disadvantaged children in six-week Head Start programs, 17 of whom were Anglo-American, and 62 Mexican-American, were pretested and posttested using seven instruments: Gesell Maturation Index, Mateer Inversion Test, tests of dominance, teacher rating scale, Goodenough-Harris D-A-P, Peabody Picture Vocabulary Test, and Wide Range Achievement Test. Results showed that certain handicaps existed among culturally disadvantaged children prior to school experience and that positive gains occurred when enrichment experiences were provided. Greatest gains were in the areas of intellectual-academic and social-emotional skills. Ethnic differences appeared in the limited linguistic skills of the Mexican-American children.

Summary

It is most difficult to summarize this review of literature in as much as it encompasses so many different and complex topics. Each topic is relevant to a study of language development, and each is necessary in an assessment of the specific deficiencies of disadvantaged children. In an attempt to focus the review on the concerns of this study, two quotations by Martin Deutsch seem particularly significant

and are included here to facilitate the summary. The first is concerned with the disadvantaged child's language development. Deutsch (1963) states that

whether or not we consider language skills as primary mediators in concept formation and problem solving, the lower-class child seems to be at a disadvantage at the point of entry into the formal learning process (Deutsch, 1963, p. 176).

Studies which have been reviewed indicate that children from lower socio-economic groups are particularly deficient in such areas as auditory discrimination, length and functional completeness of sentences, vocabulary, and articulation. In addition to socio-economic differences, there is a consistent trend toward sex differences generally in favor of girls.

The way in which these language components are linked with cognitive processes is not clear. However, there is general consensus that disadvantaged children are "restricted" in their communication styles. This restriction in turn may adversely affect their problem solving ability. In most of the measurable components of language development, disadvantaged children operate at significantly lower levels of competency than do their middle class peers. While this is noticeable at the preschool level, the gap becomes increasingly apparent as the children become older. This progressive increase in their relative level of functioning with respect to language is often referred to as the "cumulative deficit effect."

The second quotation deals with the problem of the incongruity between parental aspirations and the ability of parents to play a contributing role in the fulfillment of these aspirations. Deutsch (1963) states that

though many parents will share in the larger value system of having high aspirations for their children, they are unaware of the operational steps required for the preparation of the child to use optimally the learning opportunities in the school (Deutsch, 1963, p. 168).

Many researchers seem to concur that the family is predominantly responsible for shaping the child's communication patterns. Even more specific is the evidence indicating that the mother is the primary model in the child's acquisition of speech. In the main, however, programs dealing with families in low socio-economic areas seem to have overlooked the opportunity of stimulating and influencing this relationship and are geared instead to the educational setting. This focus continues even though research strongly suggests that, to a large degree, language patterns have already been formed by the time the child enters this setting. From the literature reviewed, it would seem logical to conclude that more attention should be directed toward investigating the dynamics of the home setting and toward helping parents to understand the developmental processes of their own children.

METHOD

Subjects

The data analyzed in this study were collected from 19 preschool children in a summer Head Start program in Denver, Colorado. A total of 27 children were enrolled in the center, 12 in the morning group and 15 in the afternoon group. The ages of the 27 children ranged from four years-nine months to six years-one month. A condition of enrollment in the summer program, imposed by the Denver Opportunity Office, called for the children to reach their fifth birthday by September 15. This was predominantly a Spanish-American group. Of the 27 subjects, 23 were Spanish-American, and four were Anglo-American. In the Spanish-American homes, English was the primary language spoken. The criteria determining eligibility for the Head Start program are based on family income level according to household size. For example, a family of four, in order to be eligible for Head Start, may not earn more than \$3,000 per year (U.S.O.E.O., n.d.).

The total enrollment of 27 was available for study. However, seven children were eliminated for the following reasons: six controls were eliminated; four had not been pretested due to late enrollment, and two withdrew from the program before posttesting was completed. One child in the program was never included in the study, since he had been identified as having severe emotional problems.

The remaining 20 subjects were distributed with 11 in the experimental group and 9 in the control group. On the advice of the statistician, the groups were then balanced in number by eliminating one randomly selected subject from the experimental group and by "creating" another subject in the control group by supplying average scores for the various tests.

The final 19 subjects in the sample ranged in ages from four years-nine months to five years-seven months. Eighteen were Spanish-American and one was Anglo-American. Nine out of the 19 subjects were boys and 10 were girls. Eligibility requirements for the Head Start program were met by 18 out of 19 subjects. Twelve of the subjects had had no previous Head Start experience, while seven had been enrolled in the winter program.

Each of the subjects attended either a morning or an afternoon session in the same center under the direction of two different teachers. Their placement in the morning or afternoon session had been determined prior to the beginning of the investigation. Because of the possibility of differences arising from the teacher variable, the children in each session were matched according to age, sex, and previous Head Start experience and randomly assigned to the experimental and control groups.

Instruments

Three instruments were selected to test the hypotheses: the Peabody Picture Vocabulary Test, the Templin-Darley Screening Test, and the Preschool Inventory.

The Peabody Picture Vocabulary Test

The Peabody Picture Vocabulary Test (PPVT) was used to provide an estimate of a subject's verbal intelligence through measuring his hearing vocabulary (Dunn, 1965).

The test consists of 150 plates. The child merely has to point to one of four pictures on a page, when the examiner says the test word. It takes approximately 15 minutes to administer.

The advantages of the instrument are as follows: 1) the test has high interest value, and therefore, is a good rapport establisher; 2) no oral response is required; 3) the test is completely untimed and thus is a power rather than a speed test; 4) it is quickly given in 10 to 15 minutes; 5) alternate forms of the test are provided to facilitate repeated measures; 6) the test covers a wide age range; 7) extensive specialized preparation on the part of the examiner is not needed for its administration; the examiner need know only the correct pronunciation of each of the words; 8) scoring is completely objective and quickly accomplished in a few minutes; 9) a detailed manual accompanies the instrument with directions for administering and scoring;

tables showing age, standard score and percentile norms; general information on test construction, standardization, reliability and validity.

The total raw score is the number of correct responses. To arrive at the total raw score, the number of errors is subtracted from the number of the last item presented, or ceiling item. The raw score can be converted to three types of derived scores: 1) an age equivalent, or mental age; 2) a standard score equivalent, or intelligence quotient; and 3) a percentile equivalent.

Alternate form reliability coefficients for the PPVT were obtained by calculating Pearson product-moment correlations on the raw scores of the standardization subjects for Forms A and B at each level. Correlations ranged from a low of 0.67 at the six year level to a high of 0.84 at the 17 and 18 year levels, with a median of 0.77.

"Congruent" validity, or the extent to which PPVT scores compare with scores on other vocabulary and intelligence tests, has been assessed by comparing the Peabody to the Binet and Wechsler scales. PPVT mental age scores have correlated with '37 Binet mental age scores over the range of 0.60 to 0.87 with a median of 0.71. On the '60 Binet the mental age correlations have ranged from 0.82 to 0.86 with a median of 0.83. PPVT I.Q.'s have correlated with '37 Binet I.Q.'s over the range of 0.43 to 0.92 with a median of 0.71. "Congruent" validity data involving the PPVT and Wechsler

scales are reasonably comparable to those derived by using the Binets. In terms of comparability of scores, the PPVT and Wechsler I. Q. values appear to be very similar to each other, although in general PPVT I. Q. 's correlate better with Wechsler than Binet I. Q. 's.

In analyzing the data from several different projects, Deutsch (1964) found a significant correlation between the PPVT and the Wepman Auditory Discrimination Test in the first grade sample.

The Templin-Darley Screening Test of Articulation

The Templin-Darley Screening Test of Articulation was used as a measure of the general adequacy of the child's articulation (Templin and Darley, 1960).

The test consists of the first 50 items of the 176 item diagnostic test. The 50 items which constitute the screening device are the ones which have been found to be the best discriminators between good and poor articulation of preschool and kindergarten children. Each test word is represented by a single line drawing. In testing a child, the examiner has the choice of using the "spontaneous method," i. e. attempting to elicit the desired test word spontaneously by asking the child to name the object pictured, or the "imitative method," i. e. saying the test word and having the child repeat it after him. Templin reported that "... since neither the spontaneous nor imitative method is superior, the method best adapted to the needs of a specific child

can be used" (Templin, 1960, p. 5). In this study the "imitative method" was used. It takes approximately 5 to 10 minutes to administer.

The manual contains the test items, a discussion of both the diagnostic and screening tests, and tables of norms for the diagnostic and screening tests arranged by age for boys, girls, sexes-combined, and upper and lower socio-economic groups.

The child's score is determined by counting the total number of Screening Test items correctly produced. Thus the child's performance can be compared with that of his peers according to the norms mentioned above. To determine whether or not a child should be studied further, another table shows the cut-off scores which separate adequate from inadequate performance at a particular age.

The test-retest reliability coefficients of the 50 Screening Test items have been reported by Templin as ranging from .93 to .99 on single age groups between two and five years for both tests.

The diagnostic test is considered to have a high degree of validity. If the 176 items are valid measures of articulation, then the 50 items are also a valid measure. The lowest correlation at any single age level between the 50 and 176 items of the Diagnostic Test is .94.

The Preschool Inventory

The Preschool Inventory (PSI) was used as a measure of associative vocabulary, personal-social responsiveness, and concept activation (Caldwell, 1967a, b).

The test consists of 85 items which require verbal and gestural responses on the part of the child and manipulation of the test materials. The items are arranged in four areas of assessment, which include personal-social responsiveness, associative vocabulary, and numerical and sensory concept activation. Personal-social responsiveness appears to involve knowledge about the child's own personal world and his ability to establish rapport with and respond to the communications of another person by carrying out both simple and complicated verbal instructions given by an adult. The associative vocabulary factor requires the ability to demonstrate awareness of the connotation of a word by carrying out some action or by associating to certain intrinsic qualities of the underlying verbal concept. This includes supplying verbal or gestural labels for certain functions, actions, events, and time sequences, and being able to describe verbally the essential characteristics of certain social roles. Concept activation is broken down into two factors, one involving numerical relations, and the other involving sensory attributes, such as form, color, size, shape, and motion. The activation involves either being able to utilize established

concepts to describe or compare attributes in relating shapes to objects and names of colors to objects or events or being able to physically execute some kind of spatial concept, such as reproducing a geometric design. High scores on this factor require the ability to label quantities, to make judgments of more or less, to recognize seriated positions, to be aware of certain sensory attributes, and to be able to execute certain visual-motor configurations. It takes approximately 20 to 25 minutes to administer the test.

The Preschool Inventory was very recently designed especially for use in Head Start with individual children in the three-to-six age range. It was developed to indicate achievement in areas regarded as necessary for success in school. One of the goals of the test was to permit educators to highlight the degree of disadvantage which a child from a deprived background had at the time of entering school in order to help eliminate any observed deficits. The second goal was to make available an instrument that was sensitive to experience and could thus be used to demonstrate changes associated with educational intervention.

There are two manuals available. One includes a description of the instrument and its standardization, directions for administering and scoring, the test itself, and tables of norms. There are norms for each factor and the total scores, arranged according to ages ranging from two years-one month to six years-six months at six-month

intervals, and according to middle and lower class groups (Caldwell, 1967a). The second manual is a technical report on the instrument (Caldwell, 1967b).

The child's score is obtained by counting the number of correct responses. All items are worth one point, except for five items which are scored either 2, 1, or 0 points, according to the level of abstraction of the response. Four factor scores are determined and a total score.

On the original standardization sample of 171 children, the correlation between the score earned on the complete version and the shortened version was .98. Split-half reliability of the shortened version, corrected by the Spearman-Brown formula, was .95. Caldwell reported that these correlations were based entirely on the original standardization sample available to the investigators and did not refer to a cross-validation sample, as would have been desirable.

Caldwell also reported that validity studies were underway, in which subsequent success in school was being related to the score on the Inventory and in which performance on the Inventory was being correlated with performance on standard psychometric instruments.

Procedure

Obtaining Cooperation of the Subjects

In order to obtain reliable results from the instruments, testing

was not begun until the second week of the nine week program. The first week was used for establishing rapport with the children and with their parents and for allowing them time to become adjusted to the Head Start center and to their new routine.

The parents, in both the experimental and control groups, were requested to sign a permission slip, thus allowing their children to participate in a study evaluating the Head Start program. Contact was made at the center and through home visits. All the parents were cooperative.

The mothers of the subjects in the experimental group were approached through home visits and were asked if they would take a special part in the study by reading books to their children for a few minutes each day in their homes. No mention was made of "language development" or of the purpose of the study. All the mothers agreed and few asked for additional information.

All the families in the experimental group were visited every two to three days during the program. Two or three books, supplied by the experimenter, were exchanged during these visits. The families in the control group were visited periodically throughout the program by the experimenter and by other staff members from the Head Start center.

Two special parent meetings were planned in conjunction with the study and were included in the schedule of weekly parent meetings.

One meeting was planned around a trip to the local public library to help the parents to secure library cards and to check out books.

Another meeting was held in the park at which time the mothers were supplied with materials for constructing their own books. Neither meeting was well attended.

During the course of the summer, two letters were delivered to the mothers in the experimental group as formal gestures of gratitude for their participation in the project. The information contained in the letters was verbally conveyed to the mothers by the experimenter, as well as through the written form.

Administration of the Instruments

During the second week of the program, all the children in both the experimental and control groups were pretested using the three instruments: the Peabody Picture Vocabulary Test, the Templin-Darley Screening Test of Articulation, and the Preschool Inventory, in that order. The tests were given in order of assumed difficulty, since the PPVT did not require a verbal response, and the PSI required both verbal and gestural responses.

A small room upstairs from the playroom was used for testing. The room contained a television set and an open closet, both of which were covered with shelf paper so as to make them less distracting. There were a low table and two small chairs for the child and the

experimenter. One window faced another house which was within a few feet of the Head Start center. Another overlooked the center's playground. The noise was apt to be distracting, and the room was often very hot. However, the experimenter was fortunate to have a separate room available for testing.

Each child was tested individually. With only one or two exceptions, the child was administered only one test on a given day. During the free play period, the child was approached and was asked to accompany the experimenter to play a game. An effort was made to approach the child while he was unoccupied. If a child refused, he was asked again later. All the children eventually acquiesced, and many seemed eager for the individual attention. A few of the boys were reluctant to leave their active play and seemed to be wary of losing possession of the toys during the interim. In such cases they were assured by the teacher that they would be able to resume their play with a particular piece of equipment upon their return to the play area.

Two persons administered the pretests. An elementary school teacher, who had volunteered her services to the Head Start program, tested all the children on the Peabody Picture Vocabulary Test. The investigator administered the Templin-Darley Screening Test and the Preschool Inventory. Since the volunteer accepted a teaching position and had to leave town before the end of the program, all three instruments were administered by the investigator during the posttesting.

The children's responses together with the stimulus words of the Templin-Darley Screening Test were recorded on a small, portable tape recorder and were analyzed later by three qualified speech therapists.

All the children were posttested during the eighth week, which was the next to the last week of the program. With the exception of changing the tester on one instrument in the posttesting, as mentioned above, the same procedure as in the pretesting was followed.

RESULTS

Each of the three hypotheses of this study was tested by application of the analysis of variance to the differences between pre and post test scores for the experimental group and the control group. Results of the tests of the hypotheses are presented individually. The components of the analysis of variance are presented in the usual format and in addition fourfold tables of mean values and the standard error of these means are presented. The standard error terms were computed by the following formula:

$$\sqrt{\frac{2(\text{M. S. error})}{N}}$$

Tests of Hypotheses

The results of tests of hypotheses which follow represent the testing of each hypothesis with respect to two groupings, sex and treatment, and the interaction of sex and treatment. In the test of Hypothesis II, there were four additional classifications: judge, the interaction of judge and sex, the interaction of judge and treatment, and the interaction of judge, sex and treatment.

Hypothesis I

Hypothesis I: Comparison of change scores for the experimental and control groups will yield no significant differences in receptive vocabulary.

Table 1 presents the summary of the analysis of variance applied to the change scores of the experimental and the control groups with respect to receptive vocabulary. None of the F-values are significant; therefore, the null hypothesis cannot be rejected. This indicates that significant changes in the receptive vocabulary of these preschool children did not occur in connection with increased exposure to picture story books.

Table 2 presents a summary of the average amounts of change associated with this analysis of receptive vocabulary. The standard error associated with these means is 3.625.

Hypothesis II

Hypothesis II: Comparison of change scores for the experimental and control groups will yield no significant differences in articulation.

Three judges were involved in the assessment of the pretest and posttest articulation scores and the appropriate additional interaction tests are included in the analysis presented in Table 3. None of the F-values are significant; therefore, the null hypothesis cannot be rejected. This indicates that significant changes in articulation skills in these preschool children are not associated with increased exposure to picture story books.

Table 4 presents a summary of the average amounts of change associated with this analysis of articulation. The standard error

Table 1. Summary of Analysis of Variance Applied to the Change Scores of the Experimental and Control Groups for Receptive Vocabulary

Source of Variation	SS	DF	MS	F
Sex	6.050	1	6.050	.184
Treatment	92.450	1	92.450	2.814
Sex X Trt.	0.450	1	0.450	.014
Error	525.600	16	32.850	
Total	624.550	19		

$p < .05$ F 1, 16 df = 4.49

Table 2. Average Amounts of Change by Sex and Treatment Associated with Analysis of Receptive Vocabulary

	Sex		Group Average
	Male	Female	
Exp.	-5.2	-3.8	-4.50
Cont.	-0.6	0.2	-0.2
Group Average	-2.90	-1.80	

Table 3. Summary of Analysis of Variance Applied to the Change Scores of the Experimental and Control Groups with Respect to Articulation as Measured by the Templin-Darley Screening Test of Articulation

Source of Variation	SS	DF	MS	F
Judge	8.633	2	4.317	.203
Sex	50.417	1	50.417	2.375
Treatment	36.817	1	36.817	1.735
Judge X Sex	2.433	2	1.217	.057
Judge X Trt.	24.033	2	12.017	.566
Sex X Trt.	2.817	1	2.817	.133
Judge X Sex X Trt.	8.233	2	4.117	.194
Error	1018.800	48	21.225	
Total	1152.183	59		

$p < .05$ F 1, 48 df = 4.04

$p < .05$ F 2, 48 df = 3.19

Table 4. Average Amounts of Change by Sex and Treatment Associated with Analysis of Articulation as Measured by the TDST

	Sex		Group Average
	Male	Female	
Exp.	-2.8	-0.5	-1.66
Cont.	-0.8	0.6	-0.10
Group Average	-1.80	0.03	

associated with these means is 2.914.

Hypothesis III

Hypothesis III: Comparison of change scores for the experimental and control groups will yield no significant differences in personal-social responsiveness, associative vocabulary, numerical and sensory activation.

Table 5 presents a summary of the F-values for the analysis of variance of the four factors of the Preschool Inventory. Complete reports of the analysis of variance for the four factors and for the total scores of the Preschool Inventory are included in the Appendix.

One of the F-values, associated with the interaction of sex and treatment in numerical concept activation, is significant at the .05 level. However, in the context of so many nonsignificant results, little importance can be attached to this finding. None of the other F-values are significant; therefore, the null hypothesis cannot be rejected. This indicates that significant changes in personal-social responsiveness, associative vocabulary, numerical and sensory concept activation of these preschool children did not occur in connection with increased exposure to picture story books.

Complete summaries of the average amounts of change associated with this analysis of the Preschool Inventory are found in the Appendix. Table 6 presents a summary of the standard errors associated with these means.

Table 5. Summary of the F-Values for the Analysis of Variance of the Four Factors and the Total Scores of the Preschool Inventory

	Factors Personal- social Responsiveness	Associative Vocabulary	Concept Activation		Total Score
			Numerical	Sensory	
Sex	.421	.129	.053	.679	.209
Treatment	.421	.046	.053	.302	.209
Sex X Treat.	.047	.005	5.263*	0.000	1.363

*Significant at the 5% level.

Table 6. Summary of the Standard Error of the Mean Associated with the Change Scores on the Four Factors and on the Total Scores of the PSI

	Factors Personal- social Responsiveness	Associative Vocabulary	Concept Activation		Total Score
			Numerical	Sensory	
Standard errors of the mean	1.31	1.97	1.23	1.03	2.79

Summary of Results

In each instance the test of the hypothesis resulted in an inability to reject the null hypothesis. Therefore, it was concluded that the experimental treatment of having mothers read books to their children was not associated with any significant change in receptive vocabulary, articulation, or the four factors of the Preschool Inventory: personal-social responsiveness, associative vocabulary, numerical concept activation, sensory concept activation. One significant difference at the .05 level was found on Factor C_1 of the Preschool Inventory: numerical concept activation, associated with the interaction of treatment and sex. However, in light of the other findings, it was difficult to attach much importance to this one significant F-value.

SUMMARY AND DISCUSSION

Summary

Research on language development, as reviewed in the literature, has been directed towards a number of important areas, including: the acquisition of speech, that is "speech readiness," the rates of learning, and the major tasks of speech development; sex differences; the relationship between language and thought; the role of auditory discrimination; ordinal position; and the importance of mother-child interaction. Children from all socio-economic groups have been studied. Recently, however, a greater amount of attention has been focused on the "disadvantaged" child and on comparing him to his middle class peers. This focus seems to have resulted from consistent indications that upon entering the school situation, lower class children are deficient in verbal and cognitive skills, and that these deficits are cumulative. The way in which language and cognition interrelate is not understood, nor are adequate instruments available for measuring overall language development in young children. Programs designed to intervene in the cultural environment of the child to alleviate these deficits have been initiated, some directly in line with the findings of research and others precluding them. This disagreement as to the means of solving the very real problem of actualizing the child's potential to succeed in school makes further investigation necessary. Since many researchers

support the belief that the family is the prime mediator in all aspects of the child's learning and especially in language development, it would seem justifiable to investigate and to place more emphasis on the home setting; this was the focus of this study.

The primary objective of this study was to investigate the relationship between specific mother-child interactions and selected aspects of language development in "disadvantaged" children.

Nineteen children enrolled in a summer Head Start program in Denver, Colorado served as subjects. Out of the 19 subjects, 18 were Spanish-American and one Anglo-American; nine were boys, and ten girls; twelve had had no previous Head Start experience, while seven had been enrolled in the winter program. Their ages ranged from four years-nine months to five years-seven months. Each subject attended either a morning or an afternoon session in the same center. Due to the teacher variable, the children in each session were matched according to age, sex, and previous Head Start experience and were randomly assigned to the experimental and control groups.

The independent variable of mother-child interaction was manipulated by having the mothers in the experimental group read picture story books to their children in their homes each day. Language development, as the dependent variable, was measured by the use of three instruments: the Peabody Picture Vocabulary Test, as a measure of receptive vocabulary; the Templin-Darley Screening Test

of Articulation, as an indicator of good and poor articulation; and the Preschool Inventory, as a measure of its four factors: personal-social responsiveness, associative vocabulary, numerical and sensory concept activation. Pre and post test scores were collected from the experimental and control groups, and an analysis of variance was applied to the difference scores.

The following hypotheses were tested:

Hypothesis I: Comparison of change scores for the experimental and control groups will yield no significant differences in receptive vocabulary.

Hypothesis II: Comparison of change scores for the experimental and control groups will yield no significant differences in articulation.

Hypothesis III: Comparison of change scores for the experimental and control groups will yield no significant differences in personal-social responsiveness, associative vocabulary, numerical and sensory concept activation.

Results of the analysis of variance indicated that there were no significant differences between the experimental and control groups. Although there was one significant F-value associated with the interaction between treatment and sex in numerical concept activation, a great deal of importance could not be attached to it in view of the lack of other significant findings. Therefore, the null hypotheses could not be rejected.

It was concluded that the experimental treatment of having the mothers read to their children was not related to these aspects of the language development of these children.

Discussion

Studies which have been conducted in the area of language development have dealt with a number of specifics, such as vocabulary, articulation, and the length, structure and function of responses. Measures of these components of speech have also been specific. Few attempts have been made to define and measure language as a broader process than speech, incorporating the non-verbal and gestural components of the communicative process.

This study recognized language in its broadest sense, using Gardner's (1964) definition as a basis, and then attempted to assess the influence of mother-child interaction on the child's language development. Since there was no single adequate measure of language available, three instruments were combined which seemed to incorporate a number of the elements of this broad spectrum.

In the sense that this study did not attempt to replicate any other study, few guidelines were available. There were similarities between this study and Irwin's (1960) in that the experimental treatment of having mothers read stories to their children at home each day was the same. There were several important differences, however: Irwin

used infants (between 13 and 30 months) as subjects instead of five-year-olds; the experimental treatment lasted over a period of 17 months instead of six weeks; assessment was in terms of frequency of phoneme types rather than measures of receptive vocabulary, articulation, and verbal, behavioral, and conceptual aspects of language. Irwin's (1960) finding that there was little difference between the experimental and control groups until 17 months, at which point the curves began to separate, suggests that timing is a factor which should be carefully considered.

Time, as it relates to Irwin's study and to the present study, can be discussed in three different aspects: the time of intervention, the duration of the experimental treatment, and the amount of time necessary for the establishment of rapport.

It is possible that the point of intervention of this study came too late in the development of the child's language. Head Start policy made available four and five-year-olds as subjects. Research indicates that the period of "speech readiness" which is dependent upon maturation of the speech mechanism and of the brain comes at approximately 12 to 18 months (Hurlock, 1964). In addition, studies have shown that the period in which language develops most rapidly starts at about 18 months and continues to about 42 months, followed by a developmental plateau (Irwin, 1960; McCarthy, 1930, Smith, 1926). On the other hand, there is also some evidence that the disadvantaged child may be

approximately one year "retarded" in his language development (Templin, 1953). Also, trends in research strongly suggest that even in the later preschool years, if given adequate environmental stimulation, disadvantaged children may make significant gains in language.

This leads to another aspect of time which needs to be considered. It seems highly feasible that the duration of the summer Head Start program and of the experimental treatment was inadequate to effect changes in language development. Irwin's (1960) study indicated that significant increases in the language development of the experimental group did not appear until four months after the initiation of the experimental treatment. It is possible that this was due partially to the maturation factor, previously mentioned, but also to the need for a more prolonged period of stimulation. If this is true, it poses serious implications for communities in which only summer-long programs for the disadvantaged are available.

A third consideration is the amount of time which is necessary in establishing rapport with Head Start families. It is generally agreed among people working in the Head Start program that gaining the trust and cooperation of the families takes a great deal of time. Consensus on this point is found especially in areas such as Denver which has had both year-long programs and summer programs, thus permitting a comparison. In this study, it was especially important to gain the cooperation of the mothers quickly and to maintain it at a high level,

since the experimental period was so short.

Another area of concern in a discussion of this study is the use of the particular instruments. In general, the Peabody Picture Vocabulary Test, the Templin-Darley Screening Test of Articulation, and the Preschool Inventory seemed to be adequate, for they included a number of the aspects of language development which the study was attempting to assess. The Preschool Inventory was a highly useable instrument, especially in the pre and post test design of this study. However, the validity of particular items in the test seemed questionable, despite Caldwell's (1967) intention of selecting them as indicators of achievement in areas necessary for success in school. One item, for example, that seemed questionable was number 45 in Factor B, associative vocabulary: "What does a teacher do?" The children, regardless of the extent of their vocabulary, answered the question in terms of their experience in the Head Start center. However, they were not given credit, since the "correct" answer, according to the scoring instructions, pertained to the function of the elementary school teacher.

Another apparent weakness of the PSI was the length of time required to administer the test, an average of about 20 minutes but, in a few cases, as long as 30 minutes. Aside from the specific failings of the instruments, they seemed to be acceptable, and the children enjoyed them.

On the 50-item Screening Test, approximately one-third of the children in this study scored below Templin's (1953) cut-off scores indicating poor articulation. According to Templin (1953), the cut-off score at age four is 23, at four and a half, 26, at age five, 31, and at six years old, 34. The mean scores of the experimental and control groups on the pretest and posttest (see Appendix) were very similar to Templin's (1953) norms for the lower socio-economic group. She indicated that at four years old the mean is 33.2, at four and a half the mean is 34.6, at five years, 36.0, and at six years, 38.8. Although a comparison of this nature was not the purpose of this study, it seemed to be interesting and pertinent, considering that the few studies in the literature which deal with Spanish-American children indicate that their level of language development is apt to fall below the norms for the lower socio-economic group. It also offers the possibility that if the children in this study were articulating adequately, significant changes over the brief experimental period would be even less likely to occur.

Limitations of the Study

The limitations of this study have been classified under three headings: the size of the sample, the control over the experimental treatment, and additional limitations.

Limitation in Size of Sample

Although initially all but one of the children enrolled in the center were utilized, six had to be excluded in the analysis for lack of data due to late enrollment or early withdrawal from the program. The final sample of 19 limited the number of variables which could be considered. The possibility of the differential effect of placement in the morning or afternoon group was one variable which had to be excluded from the analysis of variance. A t-test was done to investigate this factor. A significant difference at the .05 level was found between the morning and afternoon groups on the total scores of the Preschool Inventory. Differences between the groups on the individual factors of the PSI, on the PPVT, and on the Templin-Darley were nonsignificant. Upon the advice of the statistician, further analysis to investigate this source of variance was not attempted. Apparently, further analyses held little hope of yielding additional information as to the interaction of this variable.

Limitation of Control Over Treatment

In this study, mothers in the experimental group were asked to read to their children in their homes. The mothers in the control groups were not asked to refrain from reading to their children. It was an assumption on the part of the investigator that the reading of books was not taking place in the homes other than those in the

experimental group. The only control of the treatment in the experimental group consisted of home visits, made by the experimenter, every two to three days and verbal reports from the mothers concerning what had taken place in the home. The mothers were very straightforward about whether or not they had done the reading and apparently only returned books which had been completed. In some cases, however, it appeared that other family members were becoming involved, either in doing the reading or in listening. This practice was not discouraged by the experimenter; rather she urged the mother to maintain her central role in the interaction. Consequently, these variables might operate as a limitation in that the experimenter could not be sure that the experimental treatment was being applied in the same way.

Additional Limitations

The recording of the Templin-Darley Screening Test of Articulation is not an unorthodox means of administering the instrument. Since the experimenter was not professionally competent to assess the children's articulation, the testing sessions were recorded on a small, portable tape recorder. The tapes were later analyzed by three qualified speech therapists. The quality of the tapes, however, was not perfect and became less so with frequent use. The tapes were scored separately by each of the three judges, since initial attempts to agree

on the scoring in a group session were unsuccessful.

Another possible limitation was the necessity for the experimenter to serve both as a teacher in the program and as the tester. This would appear to introduce some bias despite all precautions.

Suggestions for Further Research

As a result of this study of the relationship between mother-child interaction and the language development of Head Start children, several suggestions are made for further research.

In this study the mothers were never directly informed as to how the reading of books would benefit their children or why the close verbal interaction between their children and themselves was so important. Throughout the study no mention of "language development" was made to the mothers in order to control the introduction of other unforeseen variables. However, it seems probable that if the mothers could be cognizant of the developmental process involved, their motivation would be increased. This is in line with Deutsch's (1963) statement that parents share in a larger value system of having high aspirations for their children, but they need to know the operational steps involved in helping their children. In addition, it would appear that parents require not only the knowledge of the operational steps but also the understanding of the reasons for the procedures.

Another suggestion is that children could be followed for two years in communities with 9- and 12-month programs in which children are eligible for Head Start at age three. This suggestion is made despite the writer's awareness that programs of this variety are not

widely existent. Many communities have only summer Head Start programs. An additional problem is that even in areas where there are 9- to 12-month programs, Head Start policy is continually changing regarding which children are eligible for enrollment.

A further recommendation would be to use Head Start families in a study, thus controlling the socio-economic factor, but to utilize the younger siblings of the Head Start children as subjects. Another possibility would be to use the combination of Head Start children and their younger siblings as subjects.

A suggestion for the use of the instruments would be to administer the Preschool Inventory in two sections: the first including the first two factors, and the second incorporating the last two factors. It seems probable that to do so would lessen the children's fatigue and would help to maintain their interest in the test.

Another suggestion would be to have a qualified person in Speech administer the Templin-Darley Screening Test, so that assessment of the children's articulation could be made at the time of testing. One advantage of the procedure used in this study should be mentioned: the children were highly interested in the recorder itself, and this could have increased their attentiveness during the testing sessions.

Despite the limitations involved and the lack of significant findings in this particular study, it is suggested that attempting to influence the mother-child interaction in the home is a promising area

for future research. The mothers and the children in this study were interested and responsive. Many of the mothers, because of large families and home responsibilities, were unable to leave their homes for any organized activities, such as parent meetings. Thus, the home seemed to be a natural and logical setting for working with the mothers and the children. These observations are in addition to the research evidence indicating that the mother is the prime mediator in her child's development of language.

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APPENDICES

APPENDIX A

PERMISSION SLIP

I agree to allow my child _____ (child's name) _____ to participate in a study evaluating the Head Start program at the Elati Center this summer. I understand that our names will not be used in the results of the study.

parent's signature

APPENDIX B

LETTER FROM EXPERIMENTER TO HEAD START STAFF

TO: Elati Staff
FROM: Marty Owen
Date: June 1968

Through teaching in the Head Start program and through my studies at Oregon State University, I have become very much interested in the language development of Head Start children. Therefore this summer with the permission of the department at the university and of the administration of Auraria and of the D. O. office, I am going to do a project on language development.

PURPOSE: The purpose of my study is to find out how much effect mother-child interaction in the home has on the language development of the child.

METHOD: The morning and afternoon groups at the Elati Head Start Center will be divided into two groups: experimental and control. Thus, there will be two experimental groups and two control groups.

During the second week of the program and during the eighth week I (hopefully with a helper) will be testing all the children in both groups using 3 language tests. All these tests, which are done individually, are simple and fun. The TV room upstairs will be used. Neither teachers nor routines should be inconvenienced.

Throughout the eight weeks I will be working with the mothers in the experimental groups, encouraging them to read and look at picture story books with their children for a few minutes each day.

In any kind of experiment a number of factors can and do affect the results. The experimenter tries to control as many of these as possible. Sometimes just a person's knowing that a particular child is in the experimental group biases his reaction to that child without his being aware of it. Since this is true, I plan to tell only Rose Lopez which children are in the experimental groups. Since she does not work directly with the children and has good rapport with the parents, she will be able to help me gain their support.

All of you will have important roles in this project. It is important that you carry on in your groups as you ordinarily would. Secondly, you can help the children in the testing situation by helping to prepare them and by letting them express their feelings. No child will be tested until he is ready.

Appendix B (Continued)

The data I collect will not be analyzed until after I return to school in September. However, when I know the results, I will share them with you and with the parents.

Thank you for helping me to carry out this project.

APPENDIX C

FIRST LETTER TO HEAD START FAMILIES FROM EXPERIMENTER

Dear _____ (Parent's Name) _____, July 21, 1968

How the days and weeks have been flying by! I have been wanting to thank each of you for being a part of the study at Elati Head Start by reading books to your child. It has made me happy to see and to hear how much you and other members of your family are enjoying the books.

Realizing that you may want more books than I am now providing and that you may want books after Head Start ends in August, I wish to encourage each of you to get your own library card at your local library, the Ross-Broadway branch at E. Bayaud and S. Lincoln Streets. On Wednesday, July 24, the Head Start mothers are planning a trip to the library for this very purpose. Mrs. Warren, the librarian who reads to the children each Tuesday, is looking forward to meeting you and to acquainting you with the library. Please come with us.

The following Wednesday at 1:30 p.m. in the park, I am planning to bring all kinds of materials so that you can make your own book to take home to read to your child. A homemade book serves the same purpose as a library or store-bought book - and in many ways is a lot more special! The important thing about reading to your child is that you and your child share this experience every day - even if it is only for a few short minutes. I think it is great that brothers and sisters are sharing in the reading. But remember that it will be most valuable to all of your children if you are there too - to read, to listen, to look at the pictures, to ask and to answer questions.

Once again; thank you and have fun!

Sincerely,

Marty Owen

APPENDIX D

SECOND LETTER TO HEAD START
FAMILIES FROM EXPERIMENTERDear (Parent's Name) ,

August 12, 1968

As you know this Thursday is the last day of Head Start. Perhaps you feel a little sad as I do that the summer has gone by so quickly.

Once again I wish to thank you for reading books to (child's name) this summer. Hopefully this has become an enjoyable experience and one which you will want to continue. If you have a library card, you can take out books like the ones which I have been lending to you. In the event that you do not have a card, I am enclosing a registration card for you. If you take it along with some identification (even an envelope with your name and address on it) to the Ross-Broadway branch at E. Bayaud and S. Lincoln, Mrs. Warren, or one of the other librarians, will gladly show you around and will help you to find books in which you are interested. If by chance you would like assistance in making your initial trip to the library, please let me know, as I will be in Denver for a few more weeks and would be glad to assist you in this way.

Getting to know you and your children has been one of the most enjoyable parts of this summer. I will miss my visits with you. Hopefully I will see you again in the future when your children are older and happily learning in school.

This Friday I will come by to pick up the books, so that I can return them to the library.

Sincerely,

Marty Owen

Table 7. Summary of the Analysis of Variance with Respect to the Four Factors and the Total Scores of the Preschool Inventory

Source of Variation	SS	DF	MS	F
Factor A. Personal-social Responsiveness				
Sex	1.800	1	1.800	.421
Treatment	1.800	1	1.800	.421
Sex X Trt.	.200	1	.200	.047
Error	68.400	16	4.275	
Total	72.200	19		
Factor B. Associative Vocabulary				
Sex	1.250	1	1.250	.129
Treatment	.450	1	.450	.046
Sex X Trt.	.050	1	.050	.005
Error	155.200	16	9.700	
Total	156.950	19		
Factor C ₁ . Numerical Concept Activation				
Sex	.200	1	.200	.053
Treatment	.200	1	.200	.053
Sex X Trt.	20.000	1	20.000	5.263*
Error	60.800	16	3.800	
Total	81.200	19		
Factor C ₂ . Sensory Concept Activation				
Sex	1.800	1	1.800	.679
Treatment	.800	1	.800	.302
Sex X Trt.	0.000	1	0.000	0.000
Error	42.400	16	2.650	
Total	45.000	19		
Total Scores of the Preschool Inventory				
Sex	4.050	1	4.050	.209
Treatment	4.050	1	4.050	.209
Sex X Trt.	26.450	1	26.450	1.363
Error	310.400	16	19.400	
Total	344.950	19		

p < .05 F 1, 16 df = 4.49

* Significant at the 5% level

Table 8. Summary of the Average Amounts of Change Associated with the Analysis of the Four Factors and the Total Scores of the Preschool Inventory

	Sex		Group Average
	Male	Female	
Factor A. Personal-social Responsiveness			
Exp.	3.2	2.8	3.00
Cont.	2.8	2.0	2.40
Group Average	3.00	2.40	
Factor B. Associative Vocabulary			
Exp.	1.6	2.2	1.90
Cont.	2.0	2.4	2.20
Group Average	1.80	2.30	
Factor C ₁ . Numerical Concept Activation			
Exp.	0.0	1.8	0.90
Cont.	1.8	-0.4	0.70
Group Average	0.90	0.70	
Factor C ₂ . Sensory Concept Activation			
Exp.	2.0	1.4	1.70
Cont.	1.6	1.0	1.30
Group Average	1.80	1.20	
Total Scores. Preschool Inventory			
Exp.	6.8	8.2	7.50
Cont.	8.2	5.0	6.60
Group Average	7.50	6.60	

Table 9. Mean Pretest and Posttest Scores for the Experimental and Control Groups

Instrument	Experimental Group			Control Group		
	Pretest	Posttest	Diff.	Pretest	Posttest	Diff.
PPVT	44.6	42.1	-2.5	44.8	40.7	-4.1
PSI						
Factor A	15.2	18.2	3.0	16.0	18.8	2.8
Factor B	8.5	10.2	1.7	6.4	9.2	2.8
Factor C ₁	8.5	9.5	1.0	8.6	10.1	1.5
Factor C ₂	11.4	13.5	2.1	12.7	14.0	1.3
Total	43.5	51.4	7.9	43.7	52.1	8.4
Templin-Darley	36.3	35.4	-0.9	35.8	35.8	0.0

Table 10. Individual Mean Pretest and Posttest Scores on the
Templin-Darley Screening Test of Articulation,
Averaged from the Scores Assigned by Three Judges

Subjects	Mean Pretest	Mean Posttest	Diff.
EM1m	48.7	43.3	-5.4
EM2m	26.0	31.3	5.3
EF3m	25.7	27.0	1.3
EF4m	44.3	43.0	-1.3
EM5a	45.0	47.3	2.3
EM6a	30.0	25.0	-5.0
EM7a	46.7	41.7	-5.0
EM8a	46.3	45.3	-1.0
EF9a	40.0	45.3	5.3
EF10a	33.3	31.0	-2.3
EF11a	13.3	9.3	-4.0
CM1m	41.7	43.7	2.0
CM2m	39.3	33.7	-5.6
CM3m	----	19.7	----
CF4m	48.0	48.7	0.7
CF5m	39.0	40.0	1.0
CF6m	----	14.7	----
CF7m	----	44.3	----
CF8m	----	47.7	----
CM9a	48.3	49.0	0.7
CM10a	27.7	----	----
CM11a	28.3	----	----
CM12a	35.0	36.0	1.0
CF13a	25.3	21.3	-4.0
CF14a	12.7	17.3	4.6
CF15a	48.3	49.0	0.7

Note:

- E - Experimental Group
- C - Control Group
- M - Male
- F - Female
- m - morning session
- a - afternoon session

APPENDIX F

LIST OF BOOKS FROM THE DENVER PUBLIC LIBRARY
USED WITH THE HEAD START FAMILIES

<u>Author</u>	<u>Title</u>	<u>Publisher</u>
Aliki	My Five Senses	T. Y. Crowell, N. Y.
Anglund, J.	In a Pumpkin Shell. A Mother Goose A B C	Harcourt, Brace & World, N. Y.
Anglund, J.	The Brave Cowboy	Harcourt, Brace & World, N. Y.
Bemelmans, L.	Madeline and the Bad Hat	Viking Press, N. Y.
Brooke, L. L.	Johnny Crow's Garden	Hale, Eau Claire, Wisc.
Brown, M. W.	The Country Noisy Book	Harper & Row, N. Y.
Brown, M. W.	The Indoor Noisy Book	Harper & Row, N. Y.
Brown, M. W.	The Seashore Noisy Book	Harper & Row, N. Y.
Brown, M. W.	The Sleepy Little Lion	Harper & Row, N. Y.
Burton, V. L.	Katy and the Big Snow	Houghton Mifflin, Boston
Carter, K. J.	Willie Waddle	Steck-Vaughn, Austin
Cooney, B.	Cock Robin	Scribner's, N. Y.
Eastman, P. O.	Are You My Mother?	Random House, N. Y.
Emberley (ed.)	London Bridge is Falling Down	Little, Brown & Co., Boston
Ets, M. H.	Another Day	Viking Press, N. Y.
Ets, M. H.	Gilberto and the Wind	Viking Press, N. Y.
Ets, M. H.	In The Forest	Viking Press, N. Y.
Feddor & Rojankovsky	The Tall Book of Mother Goose	Harper & Row, N. Y.
Fox, C. P.	When Summer Comes	Reilly & Lee, Chicago
Françoise	Jeanne-Marie Counts Her Sheep	Scribner's, N. Y.
Françoise	Springtime for Jeanne- Marie	Scribner's, N. Y.
Freeman, D.	Corduroy	Viking Press, N. Y.
Freeman, D.	Dandelion	Viking Press, N. Y.
Freeman, D.	The Turtle and the Dove	Viking Press, N. Y.
Friskey, M.	Indian Two Feet and His Eagle Feather	Children's Press, Chicago
Gag, W.	Millions of Cats	Coward-McCann, N. Y.
Garelick, M.	Where Does the Butterfly Go When It Rains	W. R. Scott, N. Y.

- | | | |
|----------------------------|---|-----------------------------------|
| Greene, T. | When I Grow Up | Greene, Brattleboro |
| Griffen, E. | A Dog's Book of Bugs | Atheneum, N. Y. |
| Gurney, N. & E. | The King, the Mice and the
Cheese (in Eng. & Span.) | Random House, N. Y. |
| Hader, B. & E. | The Story of Pancho | Macmillan, N. Y. |
| Keats, E. J. | Jennie's Hat | Harper & Row, N. Y. |
| Keats, E. J. | Whistle for Willie | Viking Press, N. Y. |
| Koch, D. | Gone Is My Goose | Holiday House, N. Y. |
| Krauss | A Hole Is To Dig | Harper & Row, N. Y. |
| Leaf, M &
Lawson, R. | The Story of Ferdinand | Viking Press, N. Y. |
| Lenski, L. | Papa Small | Walck, N. Y. |
| Lenski, L. | The Little Auto | Walck, N. Y. |
| MacDonald, G. | Little Island | Doubleday, N. Y. |
| Mayer, M. | A Boy, a Dog and a Frog | Dial Press, N. Y. |
| McCloskey, R. | Blueberries for Sal | Viking Press, N. Y. |
| McCloskey, R. | Lentil | Viking Press, N. Y. |
| McCloskey, R. | Make Way for Ducklings | Viking Press, N. Y. |
| Miller, E. | Mousekin Finds a Friend | Prentice-Hall, N. J. |
| Munari, B. | Bruno Munari's A B C | World Publishing,
Cleveland |
| Munari, B. | Bruno Munari's Zoo | World Publishing,
Cleveland |
| Petersham, M.
& M. | The Rooster Crows | Macmillan, N. Y. |
| Piper, W. (ed.) | The Little Engine That
Could | Platt, N. Y. |
| Potter, B. | The Tale of Mrs.
Tittlemouse | Warne, N. Y. |
| Potter, B. | The Tale of Peter Rabbit | Warne, N. Y. |
| Rand, A. &
Birnbaum, A. | Did a Bear Just Walk
There? | Harcourt, Brace &
World, N. Y. |
| Rey, H. A. | Curious George | Houghton Mifflin,
Boston |
| Rey, H. | Curious George Gets a
Medal | Houghton Mifflin,
Boston |
| Rey, H. | Curious George Rides a
Bike | Houghton Mifflin,
Boston |
| Rojankovsky, J. H. | Animals in the Zoo | Knopf, N. Y. |
| Sendak, M. | One Was Johnny | Harper & Row, N. Y. |
| Seuss, Dr. | El Gato Ensombrerado | Random House, N. Y. |
| Seuss, Dr. | Horton Hatches the Egg | Random House, N. Y. |
| Seuss, Dr. | The Cat in the Hat Comes
Back | Random House, N. Y. |
| Seuss, Dr. | The Sneetches and Other
Stories | Random House, N. Y. |

Shapur, F.	Round and Round and Square	Abelard-Schuman, N. Y.
Skorpen, L. M.	If I Had a Lion	Harper & Row, N. Y.
Steiner, C.	My Bunny Feels Soft	Knopf, N. Y.
Steiner, C.	My Slippers are Red	Knopf, N. Y.
Tresselt, A. R.	How Far is Far ?	Parents Mag. Press, N. Y.
Tresselt, A. R.	Rain Drop Splash	Lothrop, N. Y.
Tresselt, A. R.	Under the Trees and Through the Grass	Lothrop, N. Y.
Tresselt, A. R.	Wake Up, Farm	Lothrop, N. Y.
Tudor, T.	1 Is One	Walck, N. Y.
Wadsworth, W.	Choo Choo. The Little Switch Engine	Rand McNally, Chicago
Wildsmith, B.	Brian Wildsmith's A B C	Watts, N. Y.
Wright, D.	The Doll and The Kitten	Doubleday, N. Y.
Zion, G.	All Falling Down	Harper & Row, N. Y.
Zion, G.	No Roses for Harry	Harper & Row, N. Y.
Zolotow, C.	When the Wind Stops	Abelard-Schuman, N. Y.