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THE EFFECTIVENESS OF TWO INFANT STIMULATION PROGRAMS ON SELECTED INFANT AND MATERNAL VARIABLES

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By

Christine B. Young, B.A., M.A.

The Ohio State University
1974

Approved by

Adviser Department of Psychology
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INTRODUCTION

If the behavioral sciences have discovered anything that begins to approach in human significance the antibiotics and contraceptive pills of the biological and medical sciences and the atomic energy of the physical sciences, it may well be the new evidence of the great plasticity in infant and early child development. This new evidence provides a basis for a justified hope that the cycle of poverty generating the incompetence, that, in turn, generates poverty, can ultimately be broken. No longer is it sensible to consider the incompetence of those who have grown up in poverty the inevitable consequence of their biological inheritance and nature. (Hunt, 1969, pp. 232-233).

Research during the last several decades in early animal and human development has radically altered several widely held assumptions which had restricted our view of language and intellectual development. The general view was that an individual's capacity, pattern, and rate of development were predetermined by heredity (Stott and Ball, 1965). Hunt's thinking illustrates the degree to which our views of child development have changed.

The early beliefs of the fixed nature of intelligence, the importance of genetics, and of a predetermined development had their roots with Galton and Darwin, and even earlier with Rousseau (Hunt, 1961). Darwin and Galton assumed, primarily due to Darwin's work on evolution, that: 1). the future characteristics of an organism are determined by its genes, and 2). the future of man lies in eugenics or in superior breeding, rather than in education (Hunt, 1969). 3. Stanley Hall further developed their view with
his theory that "ontogeny recapitulates phylogeny." This thinking implies that during prenatal and early development the individual passes through certain biological and social stages achieved by his ancestors, and it is only as the person grows older that he becomes subject to progressive modification (Hall, 1904). These views had an impact on the testing movement in the United States and for many years intelligence tests were thought of as measures of the "inherited capacity" of the individual, a basic dimension not influenced to any great extent by early training or experience (Hunt, 1961).

Research dealing with sensory deprivation in animals and humans resulted in many changes in man's idea of the nature of intelligence. It was found that early perceptual experience could mold later functioning, either acting as a catalyst to improve learning, or as a depressor of cognitive functioning. Research in sensory and maternal deprivation gradually led to the realization that early perceptual and/or affective experiences can alter development.

Hebb (1949) stressed the importance of early perceptual development. He argued that firing systems (cell assemblies and phase sequences) must be incorporated into the cerebrum through "primary learning," which he thought to be based on early perceptual experiences. The intrinsic regions of the cerebrum must be properly programmed through early experiences if the organism is to function effectively later as a
problem solver. Sensory stimulation from the early environment is necessary for the maintenance and development of some neural structures which would otherwise degenerate and affect the occurrence of learning which is necessary for normal adult behavior. (Hebb, 1949).

Riesen (1958) found that perceptual deprivation could actually modify physiological structures. He reared chimpanzees in darkness for 1½ years and observed changes in the anatomical structure of their retinas, which affected their ability to see. Harlow (1949) and Hymovitch (1962), in their studies with baby rats, concluded that early perceptual enrichment facilitated later learning.

Similar studies dealing with sensory deprivation attempted to find "critical periods," or fixed time intervals when development could be optimally affected. Lorenz (1937) described the imprinting phenomenon in geese, concluding that imprinting could occur only within a very limited time period. Scott and Marston (1950) found that puppies needed to experience human contact between the third and tenth week in order to adjust adequately as pets.

This early important research with animals lead clinicians to an interest in studies concerning the effects of deprivation on humans. Many believed that the lack of mother love or the disturbance of a mother-child relationship would have negative consequences for the child. Spitz (1945) studied babies reared in an orphanage who received
little affection or stimulation, other than minimal caretaking. He found these babies exhibited depression, loss of sleep, appetite, and weight.

Casler (1961) argued that the undesirable effects of institutionalization are probably due to inadequate perceptual experiences. Separation from a mother may not have had a traumatic affect before attachment occurred, at about six months of age. He believed that some institutions could be more than adequate in providing for the normal development of children.

Hunt (1969) also interprets Piaget's theory of early cognitive development as having an impact on the changing concept of child development. His view of the reciprocal nature of assimilation and accommodation and their dependence on environmental stimulation implied that the rate of individual development may vary with the amount and quality of early experience. Piaget and others have stressed the importance of match between the environmental stimulation and the developing neural structures and suggested this match is critical in terms of maximizing the affects of experience. Hunt (1961) concludes from Piaget's postulates that early, optimal stimulation is very important for the infant's development. Thus, "the more a child sees and hears, the more he wants to see and hear."

The relatively recent turnabout in our interest in early childhood development has lead to research on the
effects of a deprived environment and the importance of adequate stimulation on language development. Many researchers have postulated that the quantity and quality of stimulation is modifiable through intervention. Intervention with lower class children has been attempted during the preschool years with limited success, and many have concluded that intervention must begin in infancy in order to have an impact on later development. This study attempts to implement an intervention program, emphasizing the acceleration of language, and is aimed primarily at increasing the quality of stimulation in certain lower class homes.
The Development of Language and Its Relationship to Early Stimulation

Language Development Theories

The acquisition of language is a critical prerequisite for many other abilities necessary for adequate human functioning. Abstract thought and the capacity to reason are related to language and all foster man's adaption to modern life. The proclivity for language is important as it guides future learning and can be a critical determinant of achievement both in school and at work. Many theorists have tried to explain how language develops and the relationship of developing speech to neural maturation has attracted much interest. These theories can be divided into roughly three categories: 1) Learning and imitation theories, 2) Meditational theories, and 3) Mentalistic theories (Reese and Lipsitt, 1970).

A. Learning theories of language development.

Mowrer (1952, 1958, 1960), Staats (1963) and others (Russell, 1927; Thorndike, 1943; Miller and Dollard, 1941) propose that language acquisition can be explained on the basis of learning principles. Mowrer drew his autistic theory of speech development from his early work with mynah birds. He found an isolated bird, cared for by a single person who talked to the bird during the caretaking process,
would learn to talk rapidly. He hypothesized that the
trainer's speech, associated with the primary reinforcers
of food and water, itself became a secondary reinforcement.
Mowrer thought that the more similarities there were between
the bird's and the trainer's speech, the more reinforcement
value the bird's speech would have (Mowrer, 1958).
Generalizing his observations to human interactions,
Mowrer contended that as the mother is likely to talk during
her caretaking of the infant, her voice acquires secondary
reinforcement properties. Some of these sounds the mother
makes may be similar to those in the baby's repertoire,
thus the baby's own voice takes on intrinsic reinforcing
properties. Mowrer proposed then that an infant's initial
vocalizations are produced solely for subjective comfort
rather than for any objective utility. However, as the
child produces an increasing number of word approximations,
and eventually words, it is likely that these will be directly
reinforced by relevant others in the environment, and the
infant's speech will become much more important and useful.

Staats (1968) stressed the importance of both classical
and instrumental conditioning principles in language acquisi-
tion. He maintained that learning principles should be
applied broadly to explain the development of language in-
cluding both speech and meaning. He hypothesized that early
vocalizations of the infant are differentially reinforced
so that sounds not associated with the child's particular
cultural-social environment will drop out. He agrees with
Mowrer that the parents' voices, associated continuously with positive reinforcements in the form of caretaking, themselves become secondary reinforcers. Thus, instrumental and classical conditioning play a role in early speech development. Approximations to words are shaped through differential reinforcement of the parents as they reinforce only better and better approximations to a word. Staats mentions that the nature of this early interaction conducive to language development is reciprocal, as the child's utterances and eventual words become stimuli for vocalizations from the parents and vice versa. The later ability of the child to hook two word utterances together and eventually to produce more complex grammatical speech is not a matter of maturation but rather due to training procedures of relevant others. The parents simply reinforce increasingly complex grammatical utterances until the child is able to converse similarly to others. (Staats, 1968).

Others have stressed the role of imitation in the acquisition of language. Piaget (1962), although certainly not of the learning theory model, stressed the importance of imitation. The infant first is able to imitate only those sounds which he already is able to produce himself. At that point, a circular reaction can be initiated as an adult imitates the infant's babbling and the infant in turn imitates the adult. With further maturation, the baby is able to imitate new sounds directly after hearing them, eventually being able to defer imitation, leading finally
Slobin (1968) stressed that theorists and researchers should not discount the important role imitation plays in the development of speech. He suggested that the child imitates certain amounts of the adult's expanded utterances as the adult provides the child with an accurate grammatical model. Slobin contended that the adult's imitation and expansion of the child's speech is also very important. There may be some "critical age" when this type of expansion by the adult and imitation by the child is most constructive in the development of speech.

B. Mediation theories of language development.

Jenkins and Palermo (1964) and Osgood (1968) have modified the learning theory account of language development slightly to include knowledge gained from verbal learning research. Jenkins and Palermo (1964) suggest that the child essentially learns by forming associations. As the parents place objects before the child and label them, the child eventually mediates the language equivalent for this object and is able to reproduce the label himself. As some of his own communications are ignored while others bring responses from the adult world, he retains speech which is important for interactions with his environment. He learns individual words, groups these words into classes which are subsequently grouped into larger classes. Thus the child learns which words have meanings, puts them into classes, and then may spontaneously substitute one word of the class for another
word in the same class. This theory places less emphasis on specific learning principles per se and more on the child's learning from his own experiences with the environment and the language of relevant others as he builds associations in his mind concerning words and grammar. He expands his own vocalizations, contracts those of his parents, and eventually arrives at complex adult syntax (Jenkins and Palermo, 1964). Osgood's (1968) theory is quite similar with the addition of a representational mediating response to account for symbolic processes.

C. The Mentalistic theories of language development.

The mentalistic theories are quite different from the previous views mentioned and are definitely more maturational in nature. Their postulates stem from and are supported by Chomsky's work (1957, 1965) with transformational generative grammar.

Lenneberg (1967) proposed a biological maturational theory based on several premises:

1. cognitive function is species specific
2. specific properties of cognitive function are replicated in every member of the species
3. cognitive processes and capacities are differentiated spontaneously with maturation
4. at birth, man is relatively immature; certain aspects of his cognitive function emerge only during infancy
5. Certain social phenomena among animals come about by spontaneous adaptation of the growing individual to the behavior of other individuals around him. " (Lenneberg, 1967, p. 25).

Language thus comes about from the human species specific cognitive structures. The cognitive function which is necessary for language development consists of an adaptive process of categorization and extraction of similarities. Lenneberg contends it is the existence of this cognitive process which gives humans the potential for language development.

Maturation is critical for language readiness as is also the language spoken by important others, which serves as a releaser of language in the child (Lenneberg, 1967). However, Lenneberg (1969) suggests that maturation of language progresses through invariant stages affected by environment only to a limited extent. Environmental stimulation may be necessary for the eventual adequate performance of speech but will not affect the normal development of internal structures. The child will use the capacity for language if there is a minimum of environmental stimulation and opportunity. "Impoverished environments are not conducive to good language development, but language development is not contingent on specific training measures." (Lenneberg, 1969, p. 643).

McNeil (1966a, 1966b, 1968) expanding upon Chomsky's theory, agrees that the process of language acquisition
depends upon the maturation of neural structures, and contends that learning theory is inadequate to account for the process. There are abstract, deep, or internal structures common to humans in all cultures which underlie surface structures. The process of language development involves the discovery of the transformational rules which relate these two structures. The child must take the language he hears and construct a theory of grammar for his particular culture in such a way as to ultimately invent new sentences of his own. The underlying structures are universal and represent innate capacities of the child for language.

McNeil argues that the process of language development is a "mental" not a "behavioral" process. It is an interaction between the experience the child has with language and the child's own innate linguistic capabilities. He suggests the child forms hypotheses concerning the transformational rules and as they are verified he applies them to his production and comprehension of language. (McNeil, 1966a). This is a maturational process involving stages.

Friedlander (1970) states that the early stage of language development is a very creative process as the child is constantly setting up and revising new classes of words in a short period of time, making hypotheses concerning these classes and assigning new words as they are heard. This process is intensely dynamic, and calls upon the higher capabilities of the child in adapting to the challenges
of his internal and external environments. The verbal styles of the parents are important in this process as the child seems to prefer vocalizations with some optimal degree of novelty and familiarity.

The general theories of language development support the view that exposure to environmental stimulation, and to a model of speech in particular, is necessary for the acquisition of language. Though theories may be in conflict about the basic nature of language acquisition, Deese (1970, p. 56) states "the need for adult stimulation in the growth of normal linguistic function seems beyond question" even though research does not yet reveal which components of the adult-child interaction are most critical. Friedlander (1972, p. 730) agrees, stating that "virtually all investigators would agree that the child's total receptive language environment plays a crucial role in shaping the development of his linguistic performance."

Social Class Differences and Language Development

Many have hypothesized language or speech to be both indicators of social class and a result of social class differences. Bernstein (1960a) postulates that language differences between the middle and lower classes result from "different modes of speech which are dominant and typical within these strata." (Bernstein, 1960a, p. 313). Different social structures place differential stress on the potentials inherent in the use of language, and the
resulting linguistic form is one of the most important means of eliciting and strengthening ways of feeling and thinking which are functionally related to that social group. (Bernstein, 1960a, p. 313).

Bernstein (1960a) suggests that there are generally two different types of language systems available for groups to use. A public language consists of "highly coded utterances," is rigid in syntax, restricted in the use of structural possibilities, tends to be somewhat categorical, and is limited in the use of adjectives and adverbs. A formal language, on the other hand, consists of "now-coding utterances," is more individual, and makes use of the possibilities of sentence organization to clarify meaning and make it more explicit.

Bernstein (1960b) contends that the public or "restricted" communication mode is more characteristic of the lower class, while formal or "elaborated" styles of communication are utilized more by advantaged families. The lower class then tends to have fewer alternatives in terms of communication, uses more concrete language, and gives the child little feedback.

Further, Bernstein (1960a) suggests that the characteristics of a public language characterize the social structure of which it is a major part. People who use a public language exclusively will tend to have narrow and authoritarian views (Bernstein, 1960a).
Hess and Shipman (1965, 1967, 1968) have also concentrated on the structure of social communication within different socio-economic groups. They argue 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" (Hess and Shipman, 1965, p. 870). They found disadvantaged mothers to be lower in their language productivity, to use fewer abstract words, and to use less complex syntactic structures with their children than did their middle class counterparts (Hess and Shipman, 1965).

Hess and Shipman (1967) also contend that the mother acts as a teaching agent to her child, she is the interpreter of the environment and her strategies will be critical in the child's later abilities to grasp concepts, problem solve, use verbal symbols, and deal with strange adults. They found that lower class mothers are not effective as teachers and argue that the teaching style of the mother is as predictive of the child's IQ as the mother's IQ and social class combined.

Bee, et.al. (1969) conducted research similar to the Hess and Shipman studies. They had 76 lower class and 38 middle class mothers of four to five year old children observed in the waiting room with their children, interviewed, and observed in a problem solving situation with their children. Socio-economic class differences were
found. During a teaching situation, lower class mothers were more likely to intrude physically into the child's problem solving, gave high rates of negative feedback, and made many concrete specific suggestions. Middle class mothers, on the other hand, gave non specific suggestions, used non verbal help infrequently and used very little negative feedback. The middle class mothers used longer and more complex sentences, more adjectives, and fewer personal referents. The assumption was made that the differences in teaching styles were important contributors to deficient functioning in the lower class child. However, no actual measures of the child's abilities were made. Zunich (1961) also found middle class mothers more often to be verbally suggestive and to interact more with their child during a problem solving situation, while lower class mothers were more restrictive, especially with male children.

Deutsch (1965) assumes that "it is the active verbal engagement of people who surround the child which is the operative influence in the child's language development" (Deutsch, 1965, p. 79). Deutsch believes there is a definite relationship between the family's style of life, social class membership and the child's language skills. Data suggest that compared to a middle class home, there is a definite lack of organized family activities in lower class homes, which precludes family interaction and conversation (Deutsch, 1965). Golden and Birns (1967) concur, stating
that "language development and the particular linguistic and conceptual style which the child acquires must be socially transmitted and reinforced." (Golden and Birns, 1967, p. 148).

Blank and Solomon (1968) contend that the most obvious deficit of the deprived child is an absence of the abstract attitude, that which makes it possible for the mental manipulation of experience, enables one to organize thoughts, reflect upon situations, and choose among alternatives. "Their behavior reflects the lack of a symbolic system by which to organize the plentiful stimulation surrounding them." (Blank and Solomon, 1968, p. 380).

Several investigators have generalized about lower class attitudes and competence levels. Zigler (1969) suggests that behavioral differences between the lower and middle classes are due to the differing rates of development of some characteristics of individuals within the two classes. He claims individuals in the lower class are generally more limited intellectually and may be at a lower developmental level than their middle class counterparts. He attributes these differences in the rate of cognitive development between the two classes to different environmental and genetic factors and to the interaction between the two. He stresses the importance of the cognitive level the individual has attained for his potential for future class membership. Zigler (1969) cites several behaviors which characterize lower developmental levels: more
physical punishment, responding to child in terms of immediate consequences rather than to the child's intent, more-external rather than internalized reinforcement, and the minimal influence of abstract, symbolic rewards.

Binstock (1971) believes that regardless of racial or ethnic identity, poverty can render one powerless as it becomes more and more difficult to deal with institutions and the outside world, and feelings of impotence and failure in life are increased. Josephson and Josephson (1973) have found the inner city adults to be characterized to a great extent by feelings of meaninglessness, isolation, and alienation. Coleman (1966) has found that lower class children in comparison with middle class children feel they have less control over their destinies and Gordon (1969) has found this feeling to characterize the disadvantaged mothers in his programs.

Hess states that the social structure is built on the degree of power or the extent to which an individual can control his own life. (1971) The urban Negro is most disadvantaged in that he has little prestige or esteem and is very restricted as to the available alternatives for action. Hess further contends that the mother does not, or can not, give her child the opportunity to choose among alternatives of action and thought. Thus the child does not learn to make discriminations, does not see his own behavior as related to consequences, and does not expect
his "efforts-to-learn" to be rewarded. This lack of self-esteem or power in the lower class child is reflected in his cognitive and academic functioning. (Hess, 1971).

**General Emprirical Findings of Differences in Social Class**

Belonging to a disadvantaged social class or minority group has been reported as being the determining factor in intellectual development, language functions, cognitive style, childrearing practices, environmental stimulation, and the prevalence of mental retardation. Measures of intelligence demonstrate that disadvantaged and deprived children score well below middle class children, and that usually this difference widens as the lower class children score poorer as they grow older (Kirk, 1966). These children come unprepared for school and by grade six are retarded on the average of two years in academic achievement. They have deficiencies in language development and possess relatively poor auditory and visual discrimination skills. (Hess and Shipman, 1965). Templin (1957) found differences between upper and lower socio-economic groups in the articulation of vowels, length of remarks verbalized, degree of complexity of vocalizations, and the vocabulary of recognition, at the lower ages. Riessman (1962) describes the "culturally deprived" child as less motivated towards education for its own sake.

Bloom, et.al. (1965) in comparing the middle and lower class homes, contend that the middle class home
provides a more complex environment for the child and is more adequate for early perceptual development, giving the middle-class children some advantage in the earlier school years. The middle-class family uses words freely, teaching the child at every opportunity by giving corrective feedback. In lower class or environmentally deprived homes, on the other hand, parents are more likely to respond to the child with a monosyllable or a nod of the head and to give little feedback concerning speech or expressive language. The lower-class child seems to be missing out on the "learning-to-learn" phenomenon, he does not view the environment as something to master through enjoyable activities. Bloom, et.al. (1965) state that ideally the intellectual development of the child should take place within the home, and that some attempts have been made to help lower class parents learn how to teach their children. However, they expressed pessimism about this possibility, as the total syndrome of poverty, broken homes, slum living, large families, and illiteracy "all conspire against the intellectual development of the child" (Bloom, et.al., 1965, p. 16). The poor education of the parents, the lack of a male figure in the home, and the lack of interaction with the child all contribute to cause depressed functioning in the lower class child.

Hunt (1966) contends that the linguistic patterns in the lower class home are limited and "wrong" for later
school standards, and that parents inhibit the child's natural questioning. He views the culturally deprived home as failing to provide an opportunity for children and young infants to have experiences required for adequate development.

At what age do most differences between children from a deprived environment and those from a more advantaged environment become evident? Deutsch (1965) found depressed language development in inner city children clearly by the first grade, and reported that the language deficits increased by the fifth grade. He called this the "cumulative deficit phenomenon" and attributed it to inadequate early preparation due to inferior caste and/or lower class, coupled with an inadequate school environment (Deutsch, 1965).

Irwin (1948) reported the phoneme frequency for two groups of infants, one group from professional homes and the other from laboring families, did not differ significantly during the first 1½ years of the infant's life. But from 1½ to 2½ years of age, the phoneme frequency between the two groups differed significantly and the difference increased as the infants grew older. Wachs, et al. (1971) found class differences in vocalization as early as seven months of age.

Golden and Birns (1967; 1971) did not find differences among Negro babies from three different groups: welfare
families, stable low-income families, and middle-income families. Using the Piaget Object Scale and the Cattell Infant Intelligence Scale, they did not find differences for the first two years of life. These investigators made special efforts to overcome any motivational factors which might affect the test performance of the infants. They believed that their results reinforce the hypothesis that lower class speech patterns are adequate for concrete language development but not complex enough for more abstract speech.

Klineberg (1944) questions the validity of using standard intelligence tests for lower class children and states that these children are not highly motivated to perform well on intelligence tests. Cazden (1970) stresses the importance of subcultural dialect differences and states that our current intelligence tests may be penalizing a child for dialect instead of for a deficiency in language.

Other researchers have also questioned the statement that the lower class Negro language style is deficient. Baratz (1970) argues that the fault lies not in the lower class Negro's inability to learn, but rather in the school's inability to adapt to the subcultural dialect of the Negro child. She, Labov (1970) and Stewart (1967) believe that the Negro child's dialect is not restricted, deficient, or pathological, but is a logical, coherent, and in its own way, grammatical language system, even though it differs
from standard English. Baratz and Baratz (1971) further contend that intervention programs which label Negro behavior as pathological and fail to use cultural norms of the community are a form of racism and doomed to fail.

Hunt (1971) however, disagrees with this "different-but-equal" hypothesis and argues that the lower class Negro dialect does not really allow an individual to communicate at a comparable level of complexity and abstraction. He believes the whole cycle to be not a function solely of the black dialect but rather of black and white poverty language style. This controversy obviously needs more research in order to be resolved.

Many theorists and researchers have generalized to a great extent about the negative qualities of lower class ghetto life: the quality of environmental stimulation is poor, family activities are nonexistent or unorganized, the quality of language stimulation is deficient, all combining to produce the many negative results which have been reported.

The generalizations of these researchers have confused many issues. They often fail to distinguish between the determinants of lower class and the characteristics of the lower class child. The term "lower class" is used loosely and fails to give us any substantial information about individual variation within the class, or about how those problems present may be best prevented or remediated.

Wachs, Uzgiris, and Hunt (1971) argue that social class really tells us little except generalizations about what
the child is actually experiencing. Beckwith (1971) suggests that class membership is too general to explain language differences and contends that restricted environment leading to deficits in speech and cognition may also be found in middle class homes. Others (Caldwell, 1970; Heber, 1970) have criticized generalizations about the lower class environment and its effect on the child's development. Caldwell believes there are many individual differences between lower class families in terms of home stimulation, and Heber contends that a major factor in the deficient intellectual development of the child is a low maternal intellectual level.

Caldwell (1970, p. 1) states that "in the past, the assumption has been made that the generic term 'social class' adequately encompassed these quantitative and qualitative characteristics." The development of an inventory of home stimulation represents a conviction that gross generalizations are insensitive to the cumulative transactions that occur between the infant and its environment.

Palmer (1970) criticizes many studies, and concludes from a review of the literature that there is often little rapport achieved with the subjects before testing and often the selection of samples is based on convenience rather than by defining attributes. Often socio-economic status and race are confounding variables. She attempted to find differences between Negro lower and middle class children at different ages. She found few differences between the
two groups before or after an eight month intervention program, and the differences she did find did not increase with age. She reasoned that she had selected stable lower class families which could have accounted for the lack of differences, and she further concluded that "the stereotype of the lower class mother of a young child as unmotivated and incapable is a myth." (Palmer, 1970, p. 11). She believes that as the children grew older, they were more out of their mother's control and became more affected by the larger environment. Golden and Birns (1967) state that many studies fail to distinguish between children from stable lower class families and those from socially disorganized families, suggesting this factor may be important in class differences, or in differences found between families of the lower class.

Heber (1970) believes that more accurate statistics and research should be undertaken in the area of environmental deprivation. He feels the predominance of the social deprivation hypothesis is not justified, as research substantiating it often is too general. He states "there has been increasing acceptance of the view that the high frequency of mental retardation found among the poor is directly attributable to the deprivation of opportunities to learn and practice intellectual skills." (Heber, 1970, p. 1). He refutes this generalization in his detailed study of a census tract in Milwaukee. He found that in a
ghetto area, mothers with an IQ of less than 80 (less than ¼ of the mothers sampled) accounted for 4/5 of the children with IQ's below 80 from that area. Therefore, he concluded that the best predictor of low intelligence in the offspring is the low intelligence of the mother. Results also revealed that the IQ's of children of mothers with IQ's below 80 declined drastically as the child grew older, while the IQ's of the offspring of mothers with normal IQ's remained constant. Heber (1970) suggests that the mentally retarded mother in the ghetto area creates a social environment for her offspring which differs significantly from ghetto dwelling mothers of normal intelligence. "Therefore we are convinced that the very high prevalence of cultural-familial retardation occurring in the slums is not randomly distributed, but is concentrated within a certain proportion of families who can be identified on the basis of maternal IQ." (Heber, 1970, p. 10).

Slaughter (1968) was interested in the important variables in the Negro mother's behavior which led to her child's success in the headstart program. She argues that the quality of the mother-child interaction determines certain forms of information processing and problem solving strategies within the child. The style of communication in the early home environment was thought to be a factor in later academic functioning. Studying six variables, she found the following three to be most important in determining the child's IQ, success in school, and achievement: 1) concepts used
by the mother, 2) individuation of the child's personality, and 3) cognitive controls used by the mother. The mothers who scored high on these variables tended to exhibit relative ease in characterizing the moods of their children, liked them to be independent, prepared their children for problems, presented models for them to imitate, placed restrictions on them, used verbal punishment, and gave them a healthy awareness of ethnicity. (Slaughter, 1968).

Biber (1967) contends that children, like their families react in different ways to poverty and should not be viewed as a "type." He does agree that lack of stimulation in the home and especially the lack of personal attention and interest in the infant's development by the parents is a critical factor in poor learning and curiosity later on.

Malcolm and Ware (1970) were interested in the impact of the quality of home stimulation on children. They administered the Peabody Picture Vocabulary Test to their Project Follow-Through first graders, and compared the results with measures of environmental characteristics in the home. They utilized the Home Environment Review to assess the quality of environmental stimulation found in lower class homes and found that eight of the scales on the HER were significantly correlated with the measured IQ of the children. \( r = .4211 \).

C. Young (1971) utilizing Caldwell's Inventory of Home Stimulation similarly found that the amount of stimulation the mother provided in the lower class home was
related significantly to the level of language development of her three-year old child, whereas her intelligence was not related to the language or intellectual scores of the child attained on the PPVT and the Meacham scale of language development. Mothers who were able to provide higher levels of stimulation seemed much more able, regardless of their level of intelligence, to influence their child's performance on a measure of language development.

Siegel and Perry (1968) found much variability in the performance of lower class Negro children on psycholinguistic tests, suggesting that tendencies to generalize about class have done a disservice to both the lower class individual and to the educational systems attempting to help him.

The contentions of many investigators that the lower class is totally inadequate with regard to home environment and language stimulation have been modified somewhat as more recent research has shed light on this issue. More sensitive investigators have found wide individual variation within the lower class, as there most probably is also in the middle class. These individual differences certainly have differential affects on the language and intellectual development of the child.

The following section deals with the subtle areas of the mother-child interaction which seem critical, regardless of class membership, for adequate language and intellectual development in the child.
The Importance of Early Stimulation for Infant Language and Cognitive Development

Recent research has brought to light findings concerning the importance of the mother and the home environment in relationship to language acquisition and class differences.

Rheingold (1956) contended that contingent reinforcement can affect the frequency of infant vocalizations. Routh (1969) suggested vocalizations could be reinforced and increased by social reinforcement from the mother. However, the complex role of contingent reinforcement on early infant language development is not fully understood, nor verified. R. Young (1971) found lower class mothers were not effective contingent reinforcers of their six-month old infant's phonemic vocalizations. These mothers had difficulty discerning phonemes and/or could not administer immediate reinforcement.

Streissguth and Bee (1972) state that the mother-infant interaction is very important to the frequency of infant vocalizations. However, the immediacy and the quantity of the mother's vocalizations are not the sole determinants. Yarrow (1968) suggests that the infant environment must be seen as an interaction, where the infant responds selectively to the adult, is capable of eliciting responses from the adult, and vice versa.

Yarrow and Goodwin (1965) suggest four variables of
maternal care are necessary for adequate infant development: 1) the amount of stimulation provided, 2) the activities of need gratification the mother provides, 3) the conditions under which stimulation takes place, and 4) the underlying feelings and attitudes of the mother towards the child. Many researchers suggest the amount of affection the mother expresses towards the infant is important. (Cazden, 1966; Jensen, 1968).

Clarke-Stewart (1973) undertook a detailed study of maternal infant interaction of lower class mothers and their 9-18 month old infants. During seven, 1½ hour observation periods of the mother-child interaction in the home, and one observation in the laboratory, she rated the infant's reaction to strangers, the social responsiveness and attachment to the mother, the infant's reaction to stress, and his reaction to new toys and situations. She utilized two infant cognitive measures, the Bayley and the Hunt-Uzgiris Scales. Clarke-Stewart found optimal maternal care to be positively related to the infant's competence and her observations revealed that the child's vocalizations were related to the amount of maternal non-responsive speech. She suggested that the infant needs maternal language as a model but not as a constant reinforcer. The amount of maternal stimulation was found to be highly related to the child's overall development. The amount of verbal stimulation directed towards the child significantly influenced his intellectual development, particularly the
ability to comprehend and express language. Mothers were especially likely to interact with their female offspring in a verbal mode.

The child's cognitive development and the complexity of his play with objects was somewhat influenced by the amount of time the mother spent playing with him with the toys present, not simply to the amount of toys present. Clarke-Stewart suggests that during these months the mother is important as a mediatory of play. She finally noted the importance of the appropriateness of maternal stimulation for the age ability of the child. Friedlander (1970) emphasizes that the mother must be sensitive in regulating her speech to the baby's limitations so that it will not exceed his decoding ability, suggesting the quality of the mother-child interaction, not the frequency of contacts, to be the critical factor in infant development.

White (1971) in another detailed observational study also reveals some critical maternal variables related to the child's competence in social and cognitive areas. He strongly concludes that the mother's actions "are the most powerful formative factors in the development of her child. The quality of the child's entire life will be affected by the mother's actions during the first three years."

(White, 1972, p. 31). He describes a competent mother in detail. The home usually contains stimulating, visual, textural, and physical objects and the child is encouraged
to explore at will without the mother following in an overprotective manner. The mother enjoys her child and is generally oriented towards his interests, although her attention is not focused on him continually. She is sensitive to what he is doing and enthusiastic, and her teaching is done more on the "spur of the moment" demanded by the child's interests rather than a planned activity of the day. She interacts with the child at an optimal level that he can handle, with patience (White, 1972).

Rubenstein (1967) studied five month old infants receiving varying amounts of attention. At six months the high attentiveness group was higher in looking at, tactile manipulation of, and vocalizing to novel stimuli and were more curious about novel stimuli than familiar ones. She concludes that maternal attentiveness, looking, holding, and talking to the baby facilitates exploratory behavior in the infant.

Yarrow, et al. (1972) found contingent vocalizations were important to infant vocalization frequency and additionally suggested caretaker variables may influence the motivational skills of the infant more than the infant's language and cognitive abilities. They suggest that motivation, important in the persistence of reaching towards and manipulating novel objects, may be quite vulnerable to deprivation.

Kagan and Tulkin (1972) and Tulkin and Cohler (1973) suggest from the results of their studies that the lower
class mother may not feel it is her role to talk and interact with her child until he is older. The lower class mother has a fatalistic view, seeing herself and the environment as having little affect on her child. Some of the lower class mothers rationally believed that one could have an affect on an infant's development, but in actuality the mothers did not act upon these beliefs.

Kagan and Tulkin (1972) compared 30 middle class and 30 lower class mothers and their behavior toward their 10 month old baby girls. They found the working class environment was more crowded with people and noise, the child was more often confined, and the infant was provided with little opportunity to experience distinct or meaningful auditory stimulation or to explore. They found middle class mothers more often engaged in face-to-face interaction with their infants, but found no class differences in affectionate or touching responses, nor in the number of maternal prohibitions. Every verbal behavior was more frequent in the middle class mother, she more often initiated vocalizations and responded to infant vocalizations quicker and more often imitated the infant's speech. Middle class mothers engaged in more games and were more responsive to infant fretting. They did not find any differences, however, in spontaneous infant vocalizations.

Lewis and Wilson (1972) found somewhat contradictory results to the above study and suggest subtle individual
differences in maternal behavior and language response may be responsible for some class differences found in infant vocalizations. Studying 12 week old lower and middle class infants, they found lower class infants vocalized and smiled more and cried less than middle class babies. The lower class mother was more physically affectionate with her infant, touching and holding him more, smiling, looking at and playing with him more frequently. There were no class differences in total maternal vocalizations. However, further study (Lewis and Wilson, 1972) revealed differences in the style of responding. Middle class mothers vocalize when their infants vocalize, touch and pick them up when they cry, and watch them when they play. Lower class mothers tend to touch their infants when they vocalize, and vocalize to them when they cry or fuss. Lewis and Wilson suggest that the maternal vocalizations instead of touching in response to the infant vocalizations involve greater "distancing" (Sigel, 1968), necessary for the development of more representational thought later on. The touching and holding of the lower class mothers in response to their infants vocalizations leads to advanced prerepresentational thought but probably impedes the development of abstract thought.

Lewis and Goldberg (1969) studied the response decrement of twelve-week old infants. Response decrement was the decrease in perceptual visual response to a redundant stimuli. Streissguth and Bee (1972) had found response decrement to
be more characteristic of intelligent children. Lewis and Goldberg found that babies with the highest response decrement had mothers with the highest infant stimulation scores during their observational sessions (involving smiling and vocalizing towards the infant). They propose that the importance of maternal stimulation is not in terms of quantity but rather in terms of the expectancy it generates in the child that his behavior will affect the environment.

Wachs, et al. (1971) used Piagetian tasks to detect early class differences in infants. They found differences in favor of the middle class as early as seven months of age. These differences increased and by 15 months there were clear differences in imitation and vocal responsiveness. This study had a defined lower class and found the lower class homes to be adequate in terms of tactile-visual stimulation. Their findings suggest that middle class parents are more sensitive to their child's abilities and needs and are more able to respond in terms of "matching" the child's functioning. They found that the lower class infant's exposure to loud continuous noise was negatively correlated with developmental measures, and lead to inattentiveness and poor psycholinguistic abilities later on in childhood. Clark and Richards (1966) and Deutsch (1964) have also supported this conclusion. Wachs, et al. (1971) found some factors were related to positive infant development only at certain ages, again stressing the concept of match, or presenting materials only when the child is optimally
These studies have lead us to many conclusions about the importance of home and maternal variables in relationship to infant and child language and cognitive development. Many now recognize the reciprocal nature of development, as the child is capable of responding selectively to stimulation and uses certain aspects of the environment discriminatively. (Yarrow, 1968). Maternal factors are critical for the adequate development of many functions in the infant. (White, 1972; Lewis and Goldberg, 1969; Hunt, 1969; Kagan and Tulkin, 1972). The most competent mother is seen as vocalizing often to her child in response to his ongoing orientation, she provides a variety of stimulating opportunities in the home, and she is generally very warm and enthusiastic about her role as a mother. The research does not present a clear conclusion as to whether maternal vocalizations are more beneficial contingent to the infant's vocalizations or rather might be more effective simply as a model for the infant to experience. Moerk (1972) suggests that as the child grows older a variety of teaching styles utilized by the mother become important, but during the earlier months, direct, clear, and consistent methods may be more effective.

The conclusion that there are critical early home and maternal variables which affect the child's later ability to learn and his general level of functioning, coupled with the fact that there are wide individual and class variations ready for them.
concerning the effectiveness of some mothers, lead many towards attempts at remediation. Prevention and inter­vention programs attempting to offset predicted school difficulties in some lower class children have been, and are still being tried with varied success.

**Attempts at Remediation**

The possibility of enrichment or intervention to compensate for or offset anticipated deficiencies has been enticing to many investigators. Most professionals have concluded that enrichment must take place at an early age, for as the child grows older the affects of deprivation become less reversible. Bloom (1964) estimated that fifty percent of cognitive development takes place by the age of four, suggesting that greater intellectual gains can be made by children of deprived environments if intervention begins early in life. Kirk (1964) agrees, and contends that the level of intellectual functioning is quite flexible in the disadvantaged and can be greatly affected by environmental experiences at an early age.

Hunt (1971) citing the research supporting the belief that development is flexible and dependent upon the environment, states that even with children of the highest geno­typal potential, it is critical that the parents be effective teachers. He contends there is a mutual cyclical relationship between incompetence and poverty, as poverty causes incompetence which leads to a lack of
environmental stimulation and proper development. Children of the poor lack experiences and nutrition even in the first year which are important for cognitive and motivational skills to develop. He believes this incompetence is no longer a necessary consequence of poverty and much of it can be changed through innovations in early childhood education. (Hunt, 1969).

The age at which intervention must occur has been of much import for those concerned with preventing the affects of environmental deprivation. Ausubel (1964) believes that the affects of deprivation are partly reversible, but that the affects become increasingly irreversible as the child grows older and the deficits "become cumulative as the plasticity of intelligence decreases." (Ausubel, 1964, p. 18). Ausubel suggests that intelligence begins as a relatively undifferentiated capacity, and as the child grows older the intelligence becomes increasingly more differentiated as some areas are stimulated and develop. However, the parts minimally developed are less susceptible to stimulation in later life. Therefore, stimulation a child receives at a young age optimally affects the overall intellectual development of the child. Thus, Ausubel is suggesting that there may be some period beyond which stimulation will have little affect.
Early Attempts at Remediation

Skeels and Dye (1939) were among the first to demonstrate that mothering and stimulation could offset the deficits caused by a minimally stimulating institutional environment. They removed 13 infants from an institution and placed them in a residential center for mentally retarded adolescents. Adolescent girls played with and cared for these infants. The differences between the experimental and control groups were significant. A follow-up 21 years later showed that the experimental group had maintained its advantage. (Skeels, 1966). Dawe (1942) was one of the first to emphasize language stimulation. She developed a program using children from an orphanage, and emphasized the training of the understanding and use of language symbols.

More Current Intervention Programs

Most recent intervention programs for the disadvantaged have concentrated either on language stimulation alone or in combination with other cognitive functions. Most programs differ in length, the age of the children enrolled, use or non use of the childrens mothers, and in the types of stimulation techniques taught.

Heber (1970) thought that it was unrealistic to expect mothers to teach their children skills which they themselves did not possess. He removed infants of low IQ mothers (less than 75) from their homes for five days a week, seven
hours a day. His program began when the infants were six months of age and continued for several years. He has found very significant differences in favor of his experimental group. Heber utilized trained mothers, also from a disadvantaged area, to tutor the infants. He provided vocational and housekeeping classes for the mothers of the infants.

Schaefer (1969) and Painter (1968) both utilized trained home tutors for their intervention programs. Schaefer's tutors visited the lower class homes five days a week for one hour a day, beginning when the children were fifteen months of age and continuing until they were 36 months old. He did not find differences between his experimental and control group infants until 27 months of age, concluding that this was probably due to the poor tests available for use with that age group.

Painter's tutors visited the home five days a week, one hour a day for one year. The training for the child emphasized language but also involved all other types of cognitive stimulation. She states that at the beginning of the program an attempt was made to involve mothers, but this was found to be impossible as the program progressed. All these children were labeled environmentally disadvantaged and were somewhat younger when the program began than the infants in Schaefer's study. Painter attempted to find a critical period for intervention but her results failed to verify one.
Bereiter and Engelmann (1968) took fifteen four-year-olds from disadvantaged homes who had older brothers or sisters doing poorly in elementary school. These four-year-olds were brought to a preschool two hours a day, five days a week for six months. Specific instruction was given in arithmetic and grammar. At the end of the six month period these children showed an average gain of several months in mental age.

Other investigators have been interested in utilizing the mother in intervention programs, most of them assuming that lower class mothers are capable of training their young children if they themselves are given specific instructions.

Karnes (1966) found the parents to be very motivated to acquire improved methods of preparing their children for school. He thought that he could effectively help lower class parents stimulate the intellectual and linguistic growth of their children. He held classes for disadvantaged mothers of young children, helping them develop educational materials for their children and giving them information on child-rearing practices. Karnes believes this type of program to be successful and found significant differences in favor of the children in his experimental group both in terms of intelligence and language abilities.

Gordon (1967) also believes that trained parent educators, themselves from a disadvantaged area, could train the mothers of young children to become teachers themselves.
He found significant changes in the experimental group children.

Irwin (1962) instructed working class mothers to systematically read to their infants, ranging from 13 to 30 months of age, pointing out pictures and naming them. He found that this specific stimulation to the infant increased their phoneme production significantly compared to a control group. Meyers (1972) also found that mothers could affect their children's language development by reading to them. This study was done when the children were 18 months of age.

Levenstein (1970) was interested in stimulating verbal interaction between disadvantaged mothers and their children. She studied three groups of low income preschoolers; one group experienced seven months of home sessions instructing the mothers in verbal stimulation. She found that the experimental group had made highly significant cognitive gains in terms of both general and verbal IQ's and also found that there were affective gains in the family itself. The mother's self-esteem appeared to improve, the child's psychosocial behavior increased, and the mother's child-rearing practices seemed to be positively affected. The yearly groups of children seen in this program tended to retain their gains into their school years and to start first grade with a capacity for school achievement and a better than average attitude toward school and learning. (Levenstein, 1973). Transfer programs to different service
agencies were very successful as the low cost and the structure of the program made it desireable for home trainers and for mothers.

The Ypsilanti-Carnegie Infant Education Project (Weikart, 1971) is based on the belief that intervention is needed early and that home teaching provides an unusual opportunity to provide intervention at an early age. This project utilized both trained teachers and college volunteers as home trainers of two different groups of 4 to 12 month old disadvantaged infants. The pilot project lasted for a period of nine weeks. The results of this short intervention showed trends of improvement on both the motor and mental scales of the Bayley. It was stressed that the home teacher be sensitive to the mother and reinforce her. Activities were planned for the mother to do during the week and the mother was provided with information concerning the development of her child. Discipline was also dealt with, as control problems often seemed to get in the way of the mother teaching her child.

At the John Tracy Clinic (Thielman, 1966) a different approach to early intervention has been used. Several lesson plans dealing with selected short subject areas (e.g., simple games, imitation, word games, songs) are sent to the mothers at weekly intervals. The mother is also provided with several charts in order to plot her child's progress in these areas. Meyers (1972) in a modi-
fication of Irwin's approach (1962) also used home mailings with success, having the mothers read to their children a specified series of books for a certain amount of time each day.

The Demonstration and Research Center for Early Education (Forrester, 1971) also utilized home visitors working with a curriculum extended downward for children 7 to 18 months of age from an earlier program working with 3 to 6 year old children. The program concentrated upon the development and provision of materials in the home settings with attention to all areas of infant development. This was a fairly comprehensive program with a detailed curriculum and stressed the importance of the interaction between the mother and her child. Special emphasis was placed upon helping the mother to recognize and facilitate her infant's behavior and development by conducting activities for him and selecting and making his play materials. The home visitors helped the mother find things in her environment which could be used to develop the infant's abilities.

Badger (1973) in a relatively recent intervention project at the University of Cincinnati, employs a group process and opportunities for imitation and direct tutoring with young adolescent lower class mothers. She begins shortly after the mothers have given birth to their babies and during weekly sessions attempts to make the mothers
more aware of the educational, cognitive, and language needs of their infants. She is very directive concerning child-centered activities but gives more leeway during mother centered activities and discussions. This is a long term program and testing of the infants is done quite frequently using Piagetian scales. However, results have not yet been published.

Intervention has thus been attempted in a variety of ways with a range of success. Heber's (1970) intensive long-term program has been quite successful. Other programs have varied with respect to the age of the child, the duration of the program, the direction of the program (aimed at child or mother), setting (home or in an institution) and the curriculum.

Issues in Remediation Attempts

A. Age of child.

Lewis (1936, 1956) states that three developmental stages of language are important in the imitation of speech, 1) the first 3-4 months of life in which the child responds to speech by vocalizations, 2) the next few months during which vocal response to speech ceases or occurs rarely, and 3) a third stage, occurring at about 10 months of age during which an effort to imitate and a renewed response to speech emerge. Lewis suggests that during the second stage the infant's responses to speech involve a growing discrimination as to the meaning of speech. The growth
of the meaning of words then tends to encourage the imitation of others speech during the third stage. (Beckwith, 1971). This theory suggests then that infants need to hear a great deal of speech during the first 10 months, but become more susceptible to direct input and imitation after that time.

Schaefer and Aaronson (1968) contend from the results of their research that tutoring should begin before 14 months of age as some infants showed signs of deprivation before that time. Eisenson (1963) writes that the establishment of conventionalized speech patterns as specific responses to socially presented speech patterns usually begins during the first half of the second year. Carmichael cites several studies which name the average time for the first meaningful speech from the infant to occur at about 11 months, with a range from 8 to 16 months. (Carmichael, 1964). Lenneberg states the first words emerge at 12 months, and at this time the infant gives definite signs of understanding other words and simple commands (Mussen, Conger, and Kagan, 1966).

The results of attempts to find social class differences at early ages have been varied. Wachs, et al. (1971) found some differences in vocalization as early as seven months. However, Bayley (1965) when standardizing her scales of infant development found no differences up to 15 months of age with the exception that Negro infants performed higher on motor scales.
Golden and Birns (1968) found no socio-economic differences between groups of middle and lower class Negro children at 12, 18, and 24 months of age on the Cattell scale and a scale involving Piagetian tasks. They did report that lower socio-economic group infants were far more difficult to test and frequently required more than one session to complete the procedure.

Friedlander (1970) found that infants 11 to 13 months of age could differentiate between speakers. Menyak (1971) in a special training project, taught infants at 11 and 12 months to say a new word after two or three repetitions.

An enrichment project in Syracuse (Caldwell and Richmond, 1964; 1967) involved children from six months to five years of age. The results were very positive and suggested that enrichment begun before the age of three could be very beneficial. Those entering the program between one and two years showed average developmental gains over a 25 month period of 14 mental development index points on the Bayley. Older children also made significant gains.

The results of these studies dealing with intervention programs and class differences suggest that intervention can successfully begin shortly before the infant's first birthday. This is a time during which the infant is attending to adult speech and is even beginning to imitate sounds, thus giving the mother or tutor a good deal of reinforcement for their teaching techniques.
B. Type of program.

Intervention can be accomplished in the home or at an institution, in a class or individually, and can be oriented towards the mother or towards the child. In a group situation, therapy principles might suggest that mothers may have several models to use and communicate with and may find other mothers have similar problems and feelings as they do. There would be more than one person to respond to another's comment and there would be a great opportunity for the mother to obtain feedback concerning what she is doing with her child. Others may suggest her problems are common and offer solutions which have worked for them. One might suspect that a mother seen individually would form a stronger attachment to the professional, the identification perhaps fostering in the mother more of an attempt to please and imitate the professional. Mothers seen individually at home, if one can generalize from research with stimulus generalization (Hall, 1966) might find it easier to apply new learning than mothers seen away from home. Also, intelligence of the mother may be more of a critical factor for the success of mothers in a class away from home. A higher cognitive level may be required to learn techniques in a class and apply them to the home situation. Less generalization would be necessary to apply those techniques learned in the home.
Starr (1971) examines the pros and cons of aiming intervention towards the mother or towards the child. The maternal approach, he suggests, is much more practical, less time consuming and expensive, but may present certain difficulties. The mothers may lose interest and/or fail to continue exercises during the week. Karnes (1966) and Badger (1973) however, report mothers to be very effective educators of their children. These investigators thought the mothers gained personally from the interaction with home visitors or group leaders and they had the impression that the mothers felt some increased sense of influence over their infants' lives.

Hunt (1969) concludes that programs employing only counseling about child-rearing are not effective. He believes a program must include demonstrations and models for imitation, with detailed explanations of child-rearing practices, as well as a deep concern for the problems of the mothers. The mother needs to see others handling her child in a competent manner and the affects and components of competent handling explained in a language she can understand. Mothers must be respected as prospective teachers of their children (Hunt, 1969).

C. Problems of evaluation intervention programs.

Evaluating intervention programs, especially those involving infant stimulation, has been difficult. Most commonly, cognitive measures of the infant are employed,
either standard intelligence or language measures (Bayley, Binet, PPVT) or tests involving Piagetian tasks. However, many have reached the conclusion that infant intelligence tests have little predictive validity for later intelligence. (Bayley, 1970). McCall (1972) and Stott and Ball (1965) attempt to explain this phenomena. They state that early intelligence may represent a different qualitative stage in development, highly related to but independent of later intelligence. McCall (1972) suggests that perhaps early items concerning vocalization may have more predictive validity than a broad range of cognitive scores. Bayley (1970) herself feels verbal scores may be the most stable indices of later development, especially in girls.

Lewis and McGurk (1972) contend that the Bayley scales and other standardized measures should not be used to assess intervention programs as they may give false results due to low correlations with later intelligence. One may falsely assume a program to be ineffective when in actuality, if it had been assessed by more specific criteria, a more reliable picture of the results would have emerged.

Gordon (1969) attempted to assess maternal variables in his intervention programs. One of the goals of his parent-education project was to increase the mother's sense of personal worth. He incorporated a modified form of his own self-concept scale to evaluate changes in the mothers. Results confirmed his expectations that mothers involved
had increased feelings of personal worth.

Innovative indices of change need to be utilized to assess change in the home, mother and infant in order to determine if future intervention programs are truly effective. Subtle measures may indicate changes in the mother which would influence later development in the infant despite the fact that immediate gains are not apparent.
STATEMENT OF THE PROBLEM

The literature review has revealed that there are many issues surrounding intervention programs. Research with infants indicates fairly certainly that maternal behavior does affect infant language and cognitive development, but we do not yet know the best means of preventing deficiencies in some lower class children.

This study proposed to compare two forms of intervention with lower class infants and their mothers. Both programs involved the same curricula, but one took place individually in the home and the other took place in a class group situation. Mothers were seen for ten weekly sessions. The primary focus of this intervention was towards the mother, changing her view of herself as a teacher and showing her specific techniques to use with her infant. The goal of this particular intervention project was to increase the general level of stimulation in the home and thereby increase the language and mental development of the child. It was hypothesized that an increase in the level of stimulation available in the home would maintain the immediate effects of intervention in the infant and would effect future changes in the child not immediately apparent. A mother who is able to continually provide higher levels of stimulation would most probably continue to positively affect the development of her child.
Measures Used

A. Cognitive and language development of the infant were measured by the Bayley Scales of Infant Development and the Houston Scale of Language Development.

B. Level of Home stimulation was measured by Caldwell's Inventory of Home Stimulation.

C. Maternal personality variables:
   1. Locus of control towards child was measured by the Social Reaction Inventory.
   2. Self-concept was measured by the How I See Myself Scale.
   3. Level of competence was measured by the Infant Care Inventory.

D. Mother's intelligence was measured by the Peabody Picture Vocabulary Test. (PPVT).

E. Teaching baby a new work and evoking familiar words were investigated by using tape recordings.

The cognitive and language development of the child, the level of home stimulation, and maternal personality variables were measured both before and after intervention. (Baseline and Outcome). The mother's intelligence was only measured once and tape recordings were utilized only as outcome measures for the two experimental groups.
Basic Hypotheses

1. Home visitor mothers and infants will score higher on outcome measures than class mothers and infants and will score higher on outcome measures than control group mothers and infants. Class group mothers and infants will score higher on outcome measures than control group mothers and infants. Specifically: Home visitor group infants will score higher on the Bayley Scales of Infant Development, and the Houston Scale of Language Development and home visitor group mothers will score higher on the Social Reaction Inventory, the How I See Myself Scale, and the Inventory of Home Stimulation. Class group mothers and infants will score higher on these measures than control group mothers and infants.

2. The home visitor group mothers and infants and the class group mothers and infants will show significant positive change within group between baseline and outcome scores on the above measures.

3. The home visitor group mothers will be more effective in teaching specific language behaviors to their infants on the tape recordings than the class group mothers, and the home visitor group infants will generally be assessed to be more vocal on the tape recordings.

4. Intelligence of the mother will be a more critical factor for positive change in home stimulation and in infant development in the class group than in the home visitor group.
**Additional Hypotheses**

5. There will be a positive relationship between the amount of infant verbalization on the tape and infant and home stimulation outcome scores.

6. Mothers with higher outcome scores on maternal variables and on home stimulation will be more effective teachers as assessed by the tape recordings.

7. Mothers with higher baseline scores on maternal variables in each of the experimental groups will have babies with higher scores on outcome variables.

8. Mothers who change the most on maternal variables will have infants who change the most on infant variables.

9. Mothers in all three groups combined with higher scores on baseline maternal variables and home stimulation will have infants with higher scores on baseline variables.
CHAPTER II

METHODOLOGY

Sample

Mothers' names for the two experimental groups and the one control group were obtained from Emergency Room records at the Children's Hospital, Columbus, Ohio. Records were reviewed by several staff members and names of families with babies the appropriate age (8 - 15 months), appearing to live in a lower class, Columbus, Ohio, neighborhood, were recorded. Families of babies with a history of seizures or other apparent serious illnesses were not considered for the project. Several hundred names were obtained in this manner.

Mothers were contacted by two methods. First attempts were by telephone. Control group mothers were asked if they would participate in a project involving two testing sessions of them and their babies over a three-month period. Experimental group mothers were told about the program and were asked if a visit could be made to their home in order to explain the program in more detail. This method of recruitment was not found to be efficient, however, as many of the mothers would agree to participate over the telephone, but would not be at home or would appear very disinterested when visited at home. All of the control group mothers were obtained in this manner and approximately 25 babies and mothers were pre-tested in order to get a final control
Another method was attempted to recruit mothers into the two experimental groups who seemed to be more motivated. Letters were sent out (see Appendix A) to over one hundred mothers for both the class and home-visitor intervention groups. A total of 32 mothers responded to the class group letter and came to some meetings. However, only 14 infants were of the appropriate age or the mothers came to enough classes and were then included in the statistical analysis. Of the one hundred letters sent out to recruit mothers for the home visitor program, approximately 17 mothers responded. Five of these mothers dropped out or moved soon after the program was started. Two other names were obtained from mothers already participating in the home visitor program, thus fourteen mothers and babies completed the program and were completely tested. There was a conscious attempt to include the same number of mothers in each of the three groups for statistical purposes.

When the initial decision to attempt a language intervention program was made, only babies delayed in language development were to be included in the programs. It was found that most of the babies screened were delayed in language, so this decision was changed in favor of taking mothers on the basis of their motivation to participate in the programs. Many of the control group subjects were selected on the basis of language delay, however, and thus
this group does have a larger proportion of babies several months delayed in language.

However, there did not seem to be any motivational differences due to the different methods of recruitment between the final three groups which were included in the statistical analyses. Control group mothers who allowed the examiners to return for two visits to their homes appeared to be interested in how their babies were doing and in the tests that were given. It was the subjective opinions of the examiners that control group mothers would have been as willing to participate in an intervention program as mothers in the two experimental groups.

The breakdown for the three groups on infant language delay is reported in table 1.

| TABLE 1 |
|----------|----------|
| GROUP    | INFANTS  |
|          | LANGUAGE DELAYED |
| (more than one month behind) |
| Control  | 12       |
| Home Visitor | 9   |
| Class    | 11       |

The sex, race, and mean age at baseline testing is reported in table 2.
TABLE 2
MEAN AGE, SEX, AND RACE OF INFANTS IN THREE GROUPS

<table>
<thead>
<tr>
<th>Group</th>
<th>Sex</th>
<th>Race</th>
<th>Mean Age in Days*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>F</td>
<td>Bl. Wh.</td>
</tr>
<tr>
<td>Control</td>
<td>7</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Home Visitor</td>
<td>7</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Class</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>

* at time of baseline testing

Social Class Data

Hollingshead’s (1957) two-factor scale of social class was utilized to determine social class membership of the 42 families in the three groups. This index is based on the education and occupation of the head of the household and groups families into one of five classes, class I being the highest and class V the lowest. The class breakdown of the three groups based on this scale is reported in Table 3.

TABLE 3
SOCIAL CLASS MEMBERSHIP

<table>
<thead>
<tr>
<th>Class III</th>
<th>Class IV</th>
<th>Class V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Home Visitor Group</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Class Group</td>
<td>2</td>
<td>12</td>
</tr>
</tbody>
</table>
Six of the families in the control group received their primary support from welfare, while five of the families in the home visitor group and seven of the families in the class group listed welfare as their primary source of support.

Demographic Data (See Tables 4, 5, and 6)

The control group mothers had a mean age of 20.6 years and a mean education of 10.4 years, none of the mothers having more than a high school education. The mean income of the families in this group was $4,300/year and six of these mothers were married, given were single, two were separated, and one divorced. One family in this group owned its own home, the remained of the families were renters.

The home visitor group mothers had a mean age of 23 years (including one 14 year old) and a mean education of 11.5 years. None of these mothers had more than a high school education. Two of the fathers present in this group had schooling beyond high school, however. The mean income of this group was $5,300/year. There were 10 fathers present in these homes, eight of the mothers were married, three were separated, two were divorced, and one was single. There was one family in this group owning its own home.

The class group mothers were 22.6 years old on the average with 11.3 years of education, only one mother going further than 2 years in school. The mean income of these
families was $3,800/year. Eight fathers were present in these homes, eight of the mothers were married, five were single, and one was divorced. Again, one family owned its own home.

**TABLE 4**

**MEAN AGE AND EDUCATION OF MOTHERS IN THREE GROUPS**

INCOME OF FAMILIES AND NUMBER OF FATHERS PRESENT

<table>
<thead>
<tr>
<th></th>
<th>Mean Age</th>
<th>Mean Educ.</th>
<th>Mean Income</th>
<th>Fathers Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>20.6</td>
<td>10.4</td>
<td>$4,300</td>
<td>6</td>
</tr>
<tr>
<td>Home Visitor</td>
<td>23</td>
<td>11.5</td>
<td>5,300</td>
<td>10</td>
</tr>
<tr>
<td>Class</td>
<td>22.6</td>
<td>11.3</td>
<td>3,800</td>
<td>8</td>
</tr>
</tbody>
</table>

**TABLE 5**

**MARITAL STATUS OF MOTHERS IN THREE GROUPS**

<table>
<thead>
<tr>
<th></th>
<th>Separated</th>
<th>Single</th>
<th>Married</th>
<th>Divorced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>2</td>
<td>5</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Home Visitor</td>
<td>3</td>
<td>1</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Class</td>
<td>0</td>
<td>5</td>
<td>8</td>
<td>1</td>
</tr>
</tbody>
</table>
TABLE 6

NUMBER OF OCCUPANTS IN THE HOME

<table>
<thead>
<tr>
<th>Total Number of People Living in the Home</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>0</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Home Visitor Group</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Class</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Measures Used

1. The Houston Test for Language Development (See Appendix E)

The Houston Test was utilized to determine the amount of language delay, if any, in the three groups of babies, and to assess change after a three month period (including 10 weeks of intervention in the two experimental groups).

As opposed to some other scales of language development, this measure relies on observations of the child himself and has been utilized frequently to successfully discriminate levels of infant language development. (Psarras, 1973; Abraham, 1973; Meyers, 1972).

Crabtree developed this scale in 1958 to "measure the growth of language in the children in order to determine the level of therapy needed and in addition to measure progress with therapy." (Crabtree, 1958, p. 1). It was devised
specifically to be applied to the language development of infants or of very young children up to three years of age. The test was initially standardized on a group of 113 white children from the Greater Metropolitan Area of Houston, Texas. The observations of two examiners yielded a reliability measure of .84.

Part I of the test for the first six months of infancy consists of nine items designed to measure receptive (e.g., attends to voice), expressive (e.g., smiles, laughs, coos), and conceptual abilities. Part II of the test, for months 6-12, also involves nine items and measures more advanced expressive abilities (e.g., vocalizes syllables, says two words), the ability to imitate, and receptive skills (e.g., waving bye-bye). Part III (12-18 months) and part IV (18-24 months) each involve six items.

The test is scored on the basis of weighted factors for each six months. A lag score or advanced language score was determined for each infant in this study on the basis of a difference in months between his language age and his chronological age. Most of the babies seen were behind in language, thus most scores reported will be in negative numbers (e.g., a score of -2.3 can be interpreted as a little more than a two month lag in language development as assessed by the Houston Test).

Items are scored after a ½ to 1 hour observation of the infant in the home. Attempts are made to create a calm
atmosphere and both the mother and examiner are encouraged to actively elicit vocalizations from the infant.

2. The Bayley Scales of Infant Development.

The Bayley Scales were used to measure baseline and outcome cognitive and motor development in the infants.

The Bayley Scales were developed in an attempt to measure the relevant behaviors of infant cognitive and motor development. They are not a downward extension of adult scales and utilize special stimuli which are attractive to infants. Bayley (1969) contends that infant intelligence progresses from very simple to somewhat more complex functions, but cannot be differentiated into consistent factors or abilities as adult tests might be. Thus, subscales are not present in this measure.

"The mental scale is designed to assess sensory-perceptual acuities, discriminations, and the ability to respond to these, the early acquisition of object constancy, and memory, learning, and problem solving ability; vocalizations and the beginnings of verbal communications " (Bayley, 1969, p. 3).

The motor scale was also utilized in this study and is designed to measure the progressive growth of body and large and small muscle coordination.

The Bayley Scales were standardized on approximately 1300 children from 1958 to 1960 and the sample was thought to be comparable to the general population of the United
States in terms of sex, birth order, geographical location, and parental education level. Several ethnic groups were included in the sample.

Split half reliability coefficients for the mental scale range from .81 to .93 and range from .68 to .92 on the motor scale. The scales yield standard scores and are reported in terms of a Mental Development Index (MDI) and Psychomotor Development Index (PDI) and have a mean value of 100 with a standard deviation of 16, similar to traditional IQ distributions.

The Bayley Scales have seen wide use in both clinics and hospitals and in research. McCall (1972) states them to be the best standardized and researched infant tests. The mental and motor scales are arranged in order of increasing difficulty corresponding to increasing chronological age of the infant. Items need not be administered in any specific order and every attempt is made to determine if a certain required behavior is within the infant's repertoire of abilities.

3. The Peabody Picture Vocabulary Test (PPVT)

The PPVT was employed to assess the general intelligence level of the mothers in the three groups. This test was selected as a screening measure and was thought to have advantages over other measures. It is designed to give an estimate of the subject's verbal intelligence and is highly correlated with other traditional tests of intelligence.
(Strandberg and Griffith, 1969). The test seems to have a high interest value and requires no verbal response or reading ability; (Dunn, 1965). It is a short test to administer (10 - 15 minutes) and scoring is completely objective. Piers (1965) states that the PPVT is now the best test of its kind available. Heber (1970) also used the PPVT as a screening device for mother's intelligence.

4. The Home Stimulation Inventory for Infants (See Appendix C)

This scale (Caldwell, 1970) was used to assess the general level of stimulation in the homes, both before and after a three month period. The scale was used by Young (1971) and has since been used by Meyers (1972), Abraham (1973) and Psarras (1973). It was found to be a sensitive discriminator of the level of stimulation present in the lower class home and wide individual variation was found. Young (1971) found this scale to be highly correlated with the language development of three year old lower class children.

The inventory is appropriate for mothers of children 0 - 3 years of age and ranges from a low score of 0 to a high score of 45, a higher score reflecting a higher level of stimulation in the home. The inventory is completed by the examiner after a 45 minute observaiton of the home and the mother - child interaction. Items are checked "yes" or "no" and only two items require a direct question of the mother. The inventory is "designed to sample certain
aspects of the quantity and quality of the social, emotional, and cognitive support available to a young child within his home." (Caldwell, 1970, p. 1). Caldwell states the following factors to be measured specifically:

1. basic attachment
2. physical environment
3. freedom of child to explore and master
4. predictability of daily schedule
5. opportunity to assimilate and interpret experiences within a consistent cultural milieu
6. minimization of restriction and punishment

(Caldwell, 1970, p. 5).

Caldwell hopes that her scale will help to provide a more accurate description of the home environment and identify needed areas of intervention.

The actual test items are grouped into six sections:
1. Emotional and verbal responsivity of the mother
2. Avoidance of restriction and punishment
3. Organization of environment
4. Provision of appropriate play materials
5. Maternal involvement with the child
6. Opportunities for variety in daily routine

Unfortunately, Caldwell has not published any data on this scale. However, Psarras (1973) indicates reliability between observers to range from .791 to .924 for the various factors.
5. The Social Reaction Inventory (See Appendix D)

The Social Reaction Inventory (SRI) is a modification by Gordon of Rotter's (1966) Internal-External (I-E) Scale. It is an attempt to measure a person's sense of being or not being in control of his own life. When an event is interpreted by a person as following an action of his own but not contingent on his action, but rather a result of luck, Rotter has labeled this as a belief in external control. If a person sees the event as contingent upon his own behavior or his own characteristics, this is labeled a belief in internal control. Investigators have shown individuals who believe in internal control are more likely to take social action to better their life conditions. (Gore and Rotter, 1963).

Gordon has utilized the SRI to measure the mother's initial sense of control over her and her child's life and any change in this view which might result from intervention. (Gordon, 1969).

The original I-E scale was a forced choice questionnaire which has demonstrated adequate internal consistency and test-retest reliability. (Rotter and Mulry, 1965). The test primarily samples general attitudes and the score is simply the number of "external" choices made by the subject. The SRI is quite similar, with 29 items, including six fillers. A high score indicates a greater belief in external control. Gordon found his lower class mothers
to be more external than any of the groups Rotter measured (Gordon, 1969).

6. The How I See Myself Scale (HISM) (See Appendix E)

Gordon has also modified his own self-concept scale, originally used with school-aged children, the HISM (Gordon, 1968). It was changed to be suitable for mothers and is purported to look at four factors: autonomy, interpersonal adequacy, physical appearance, and attitudes towards teachers and schools.

Gordon has used this scale to detect differences between groups of women and changes in lower class mothers' self-esteem after an intervention program. (Gordon, 1969; 1970). He has also used it to detect any changes which may occur after the training of parent educators. The scale is not fully standardized but has been used extensively as a description test of various groups. Gordon (1969, 1970) has generally found positive changes in self-esteem after a mother has completed a parent-education program.

The scale itself includes forty items. Each item is a Leiter-type scale from 1 to 5, and positive and negative items are randomly on either side of the page. The scale is scored into four factors: Competence, Physical Appearance, Social Male, and Interpersonal Adequacy. A total score is also computed. A high score on each subscale and on the total scale indicates higher self-esteem. Total scores range from 0 to 160.
7. The Infant Care Inventory (See Appendix F)

The Infant Care Inventory (Competency scale) is a maternal competency scale developed by Hock (1972). It was designed to measure a mother's feelings of competence in relating to her own baby. It is a non-standardized research instrument and has been used generally to find individual differences between mothers concerning their feelings of competence.

The scale itself is eight pages long. Each page is headed by an activity concerning which a mother is to rate her own ability compared to the ability of other people. The number of times a mother chooses another person as handling a certain activity better when she could have chosen herself is her score. A higher score would represent a lower sense of competency.

8. Social History Questionnaire (Appendix G)

A social history questionnaire was completed by the examiner during one of the testing sessions. It contained items concerning general demographic information as well as detailed questions about the infant's delivery, health history, and the mother's child-rearing techniques.

9. Tape Recordings (See Results section for factors)

Tape recordings were utilized to assess the degree of competency found after the intervention programs in the two experimental groups of mothers. The purpose of the tapes was to give the examiner idea of the mother's ability to
teach her baby to talk. Mothers were given no specific instructions other than to attempt to teach their baby one new word during a 1½ minute tape recorded session. (Trial I) Then they were asked to elicit as many words already in the infant's repertoire as they could, during another 1½ minute tape recorded session. (Trial II). Both Trial I and Trial II took place during the outcome testing session.

These tapes were scored by counting several different factors: 1) the number of times the mother said desired word, 2) the number of times she said the word alone, 3) the number of times she said the word in combination with other words, 4) the number of verbal styles she used, 5) the number of times the mother changed verbal styles, 6) the number of times mother positively reinforced child, 7) the number of times mother negatively reinforced child, 8) the amount of time the mother was silent during the session, 9) the number of times the infant said the desired word, 10) the number of times the infant approximated the desired word, 11) the number of times the infant said other words, 12) the number of times the infant approximated other words, 13) the number of syllables or phonemes the infant said, 14) the amount of time the infant spent crying, 15) the amount of time the infant spent laughing or cooing, and 16) the examiner rating of maternal warmth.

Reliability of scoring was determined by having two judges rate 10 tapes independently on the above variables.
Reliability data is reported in Table 7.

**Procedure**

Data Collection. There was approximately a thirteen week period between baseline and outcome testing for all 42 mothers and babies. This varied to as much as 15 or 16 weeks for some mothers to complete the personality tests.

The baseline testing schedule involved a visit to each mother's home. The program was explained to her in more detail if she was an experimental group mother, and the examiner talked to her about the baby and observed her interaction with the baby for the first 25 minutes. The tests were introduced and the mother was asked to hold the baby on her lap for the administration of the Bayley Mental Scale. Often mothers attempted to intervene and help the baby; she was asked not to do this as we were trying to determine what the baby could do on his own. She was given the three maternal scales to complete and she was asked to have them completed for the first class or home visit, or in the case of control group mothers the scales were picked up at the home a few days later. The examiner completed the Houston and Home Stimulation scales immediately after leaving the mother's home.

Outcome testing was similar with the administration of the Bayley and observation of the mother and her child. The PPVT was then administered to the mothers and the social history questionnaire completed. Experimental group
TABLE 7
INTER-RATER RELIABILITY:
TAPE RECORDED VARIABLES

<table>
<thead>
<tr>
<th>Variable</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of times mother says word</td>
<td>.9934</td>
</tr>
<tr>
<td>Number of times mother says word alone</td>
<td>.9923</td>
</tr>
<tr>
<td>Number of times mother says word in combination with other words</td>
<td>.9634</td>
</tr>
<tr>
<td>Number of times mother changes verbal style</td>
<td>.8682</td>
</tr>
<tr>
<td>Number of verbal styles</td>
<td>.7113</td>
</tr>
<tr>
<td>Number of times mother positively reinforces infant</td>
<td>.8480</td>
</tr>
<tr>
<td>Number of times mother punishes infant</td>
<td>.9242</td>
</tr>
<tr>
<td>Amount of times mother is silent</td>
<td>.8910</td>
</tr>
<tr>
<td>Number of times baby approximates desired word</td>
<td>.9687</td>
</tr>
<tr>
<td>Number of times baby says desired word</td>
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</tr>
<tr>
<td>Number of syllables baby says</td>
<td>.9748</td>
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<tr>
<td>Number of other words baby says</td>
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<td>Amount of time baby cries of fusses</td>
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<td>Amount of times baby laughs or coos</td>
<td>.9042</td>
</tr>
<tr>
<td>Rating of maternal warmth</td>
<td>.8296</td>
</tr>
</tbody>
</table>

*Pearson Product Moment Correlations*
mothers were then asked to teach their babies a new word and elicit familiar words for two tape recorded 1½ minute sessions. All mothers were again given the maternal scales to complete and these scales were picked up several days later.

Control group mothers were thanked profusely for their participation in the program and any questions they had were answered. They were given any feedback they requested concerning the testing of their baby.

Experimental group mothers were thanked again and their impressions of the programs were discussed. These mothers would be contacted monthly by letter, discussing things they could do at home with their babies.

Curriculum and Program. There were 14 mothers in each of the two experimental groups. Each group underwent a ten (in a few cases twelve) weekly sessions aimed at accelerating language in their year old infants. The class group mothers came to the Children's Hospital, Columbus, Ohio. Transportation and babysitting at the hospital were provided for them. The class group mothers attended an average of seven meetings. Each session lasted for two hours and began with a discussion of the child and the activity which had been assigned for the prior week. Each week's lesson centered around a specific activity which could be done at home with the infant, and the mother was asked to complete a work sheet at home describing her daily sessions with the infant. Sessions involved several weeks of
making items (toys, books, puppets) that could then be used at home to stimulate talking in the infant. The group leader encouraged intergroup discussions concerning the children. Specific problems were dealt with by the group and the group leader as they were mentioned in the discussion.

Mothers in the home visitor program were visited weekly in their homes for a one-half to one hour session. If mothers were not at home at the scheduled time, one other attempt was made to see them during the week. There were very few instances of mothers not being home when a visit was scheduled, however. The format of the visit was similar to that of the class. The prior week's activity and the mother's success or problems with it were discussed. New activities were introduced each week and mothers were encouraged to role-play the activity with their infants while the home visitor was still in the home. The mothers themselves were given a great deal of reinforcement for the interaction with their infants. As the home visits lasted only ½ hour compared to the two hour class sessions, the class group mothers had some advantage in terms of total time seen.

The ten-week curriculum was as similar as possible for the two experimental groups. (See Appendix H). There were some sessions as the hospital which were impossible to duplicate in the home. (e.g., a pediatrician, a nutritionist, and a representative from Planned Parenthood
were speakers at different sessions, and a movie was shown during one session). An attempt was made to cover this additional material with the mother in the home.

The curriculum was aimed at increasing the mother's awareness of herself as an important teacher of her baby. She was taught general principles of home and language stimulation. General principles of child development and discipline were also discussed. The sessions specifically included a discussion of imitation, making and using toys, books, and puppets, the purpose and use of commercial toys, discipline, child development, and the future language and cognitive development of the child. The curriculum itself was general and was not based on any one theory of language development. Imitation and the importance of reinforcement when shaping language were emphasized several times. The mother was asked to talk a lot to her child as she was an important model for language development in the child. The staff's view in developing the curriculum was to stimulate the mother's awareness of herself and her influence on her child. This would potentially produce significant long-term in addition to significant short-term changes in the child's language performance.
CHAPTER III

RESULTS

Differences Between Groups

The significant sources of variation among the three groups were determined through the use of analyses of variance on the measures listed below. Tests of significant differences (t-tests) between means were performed where indicated to determine which groups differed on the specified variable. In certain instances there were significant differences between the three groups on baseline measures. Analyses of covariance were performed to partial out the effects of these differences in baseline scores.

The scores analyzed statistically were:

1. Infant variables
   a. Bayley Scale of Mental Development
   b. Bayley Scale of Motor Development
   c. Houston Scale of Language Development

2. Maternal variables
   a. Intelligence (Peabody Picture Vocabulary Test—this measure was administered only once)
   b. Self-concept as measured by the How I See Myself Scale and four subscales (Interpersonal Adequacy—IA, Personal Appearance—PA, Competency—C, and Social Male—SM)
c. Sense of competence as measured by the Infant Care Inventory

d. Locus of control as measured by the Social Reaction Inventory

e. Level of home stimulation as measured by the Inventory of Home Stimulation and six subscales (emotional and verbal responsivity of the mother, avoidance of restriction and punishment, organization of environment, provision of appropriate play materials, maternal involvement with the child, opportunities for variety in daily routine)

3. Tape recorded variables (utilized only as on outcome measure for two experimental groups)

a. Maternal responses

1) Number of times mother says desired word

2) Number of times mother says desired word alone

3) Number of times mother says desired word in combination with other words

4) Number of verbal styles mother uses

5) Number of times mother changes verbal style

6) Number of times mother positively reinforces child

7) Number of time mother punishes child

8) Amount of time mother is silent during session
b. Infant responses

1) Number of times infant says desired word
2) Number of times infant approximates desired word
3) Number of times infant says other words
4) Number of times infant approximates other words
5) Number of syllables or phonemes infant says
6) Amount of time infant spends crying or fussing
7) Amount of time infant spends cooing or laughing

c. Examiner rating of maternal warms towards child (from 1-negative to 5-positive)

Baseline Differences Between Groups on Infant and Maternal Variable Scores

t-tests for significant differences between groups were performed on all baseline test data as it appeared there might be some group differences which would necessitate analyses of covariance for outcome scores. The t-tests revealed the following significant results: (See Table 8).

1. A significant difference was found between the Home-Visitor (H-V) group and the Control group (C) on the baseline Houston test score. \( t = 2.289, p = .030 \).

2. There was a significant difference between the H-V and Class (CL) groups on the baseline Bayley
### TABLE 8
MEANS FOR BASELINE VARIABLES AND t-TEST ANALYSES FOR SIGNIFICANT DIFFERENCES BETWEEN GROUPS

<table>
<thead>
<tr>
<th></th>
<th>Home Visitor</th>
<th>Class</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houston</td>
<td>Mean</td>
<td>-1.9357</td>
<td>-2.509</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.06</td>
<td>2.08</td>
</tr>
<tr>
<td></td>
<td>t between H-V and Control = 2.289</td>
<td>p ≤ 0.030</td>
<td></td>
</tr>
<tr>
<td>Bayley Motor</td>
<td>Mean</td>
<td>110.5</td>
<td>95.92</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>13.4</td>
<td>20.2</td>
</tr>
<tr>
<td></td>
<td>t between H-V and Class = 2.247</td>
<td>p ≤ 0.035</td>
<td></td>
</tr>
<tr>
<td>How I See Myself</td>
<td>Mean</td>
<td>139.2</td>
<td>123.4</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>18.2</td>
<td>17.5</td>
</tr>
<tr>
<td></td>
<td>t between H-V and Class = 2.336</td>
<td>p ≤ 0.027</td>
<td></td>
</tr>
<tr>
<td>Infant Care Inv.</td>
<td>Mean</td>
<td>2.3</td>
<td>0.57</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.6</td>
<td>0.90</td>
</tr>
<tr>
<td></td>
<td>t between H-V and Class = 2.309</td>
<td>p ≤ 0.035</td>
<td></td>
</tr>
<tr>
<td>Home Stim. Inv.</td>
<td>Mean</td>
<td>30.6</td>
<td>31.6</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>4.6</td>
<td>6.9</td>
</tr>
<tr>
<td></td>
<td>t between Class and Control = 2.062</td>
<td>p ≤ 0.049</td>
<td></td>
</tr>
</tbody>
</table>
TABLE 8 (cont.)

<table>
<thead>
<tr>
<th></th>
<th>Home Visitor</th>
<th>Class</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peabody Picture</td>
<td>Mean 95.78</td>
<td>90.64</td>
<td>83.92</td>
</tr>
<tr>
<td>Voc. Test</td>
<td>SD 14.86</td>
<td>19.93</td>
<td>11.24</td>
</tr>
<tr>
<td></td>
<td>t between H-V and Control = 2.381 p &lt; .026</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Motor scores. \( t = 2.247, p < .035 \).

3. A significant difference was found between the HV and CL group on the total self-concept scale. \( t = 2.336, p < .027 \).

4. A significant difference was found between the HV and CL groups on the competency scale. \( t = 2.309, p < .035 \).

5. A significant difference was found on the Inventory of Home Stimulation between the CL and Control groups. \( t = 2.062, p < .049 \).

6. HV group mothers had significantly higher intelligence scores than Control group mothers. \( t = 2.381, p < .026 \).

Outcome Differences Between Groups on Infant and Maternal Variable Scores

Hypothesis 1 was investigated through the use of analysis of variance and t-tests. Analysis of variance (See Table 9) suggested significant sources of variance among the three groups which were confirmed by t-tests on several outcome measures. (See Table 10).

1. There was a significant difference between the HV and Control groups on the Houston Scale of Language Development. \( T = 2.920, p < .008 \).

However, an analysis of covariance (See Table 11) partialling out the affect of a significant difference on baseline Houston test scores, revealed there was no
**TABLE 9**

**ANALYSES OF VARIANCE:**
**OUTCOME MATERNAL AND INFANT TEST SCORES**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houston</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>49.88</td>
<td>4.307**</td>
</tr>
<tr>
<td>within groups</td>
<td>39</td>
<td>11.58</td>
<td></td>
</tr>
<tr>
<td>Bayley Mental Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>118.12</td>
<td>.448</td>
</tr>
<tr>
<td>within groups</td>
<td>39</td>
<td>263.76</td>
<td></td>
</tr>
<tr>
<td>Bayley Motor Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>413.31</td>
<td>3.208***</td>
</tr>
<tr>
<td>within groups</td>
<td>39</td>
<td>128.84</td>
<td></td>
</tr>
<tr>
<td>How I See Myself, Total Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>391.15</td>
<td>1.258</td>
</tr>
<tr>
<td>within groups</td>
<td>38</td>
<td>311.01</td>
<td></td>
</tr>
<tr>
<td>How I See Myself, Interpersonal Adequacy Subscale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>15.87</td>
<td>.276</td>
</tr>
<tr>
<td>within groups</td>
<td>38</td>
<td>57.42</td>
<td></td>
</tr>
<tr>
<td>How I See Myself, Social Male Subscale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>51.89</td>
<td>1.450</td>
</tr>
<tr>
<td>within groups</td>
<td>38</td>
<td>35.78</td>
<td></td>
</tr>
</tbody>
</table>

**p < .02**

**p < .05**
<table>
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<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>How I See Myself Personal Appear. Subscale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>99.02</td>
<td>2.682</td>
</tr>
<tr>
<td>within groups</td>
<td>38</td>
<td>36.92</td>
<td></td>
</tr>
<tr>
<td>How I See Myself Competency Subscale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>19.01</td>
<td>1.581</td>
</tr>
<tr>
<td>within groups</td>
<td>38</td>
<td>12.03</td>
<td></td>
</tr>
<tr>
<td>Social Reaction Inventory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>0.09</td>
<td>0.008</td>
</tr>
<tr>
<td>within groups</td>
<td>38</td>
<td>11.39</td>
<td></td>
</tr>
<tr>
<td>Competency Scale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>9.81</td>
<td>1.654</td>
</tr>
<tr>
<td>within groups</td>
<td>38</td>
<td>5.9</td>
<td></td>
</tr>
<tr>
<td>Home Stimulation Inventory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>461.17</td>
<td>9.177*</td>
</tr>
<tr>
<td>within groups</td>
<td>39</td>
<td>50.25</td>
<td></td>
</tr>
</tbody>
</table>

* * p < .001
TABLE 10
MEANS FOR OUTCOME VARIABLES AND t-TEST ANALYSES FOR SIGNIFICANT DIFFERENCES BETWEEN GROUPS

<table>
<thead>
<tr>
<th></th>
<th>Home Visitor</th>
<th>Class</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houston</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-0.7</td>
<td>-2.34</td>
<td>-4.47</td>
</tr>
<tr>
<td>SD</td>
<td>2.3</td>
<td>3.4</td>
<td>4.2</td>
</tr>
<tr>
<td>t between H-V and control = 2.920</td>
<td>p &lt; .008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bayley Motor Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>107.2</td>
<td>100.3</td>
<td>96.5</td>
</tr>
<tr>
<td>SD</td>
<td>9.5</td>
<td>14.6</td>
<td>9.1</td>
</tr>
<tr>
<td>t between H-V and control = 3.035</td>
<td>p &lt; .005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Stim. Inv.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>38.4</td>
<td>31.8</td>
<td>27.0</td>
</tr>
<tr>
<td>SD</td>
<td>5.3</td>
<td>7.5</td>
<td>8.1</td>
</tr>
<tr>
<td>t between H-V and control = 4.401</td>
<td>p &lt; .0001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t between H-V and class = 2.697</td>
<td>p &lt; .013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source</td>
<td>df</td>
<td>MS</td>
<td>F</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>----</td>
<td>----------</td>
<td>---------</td>
</tr>
<tr>
<td>Houston (with pre Houston score as covariate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error within</td>
<td>38</td>
<td>9.647</td>
<td>2.199</td>
</tr>
<tr>
<td>Difference for testing adjusted means</td>
<td>2</td>
<td>21.2174</td>
<td></td>
</tr>
<tr>
<td>Houston (with PPVT as covariate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error within</td>
<td>38</td>
<td>11.88</td>
<td>3.886***</td>
</tr>
<tr>
<td>Difference for testing adjusted means</td>
<td>2</td>
<td>46.18</td>
<td></td>
</tr>
<tr>
<td>Bayley Motor (with pre Bayley Motor as covariate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error within</td>
<td>38</td>
<td>59.8348</td>
<td>5.751***</td>
</tr>
<tr>
<td>Difference for testing adjusted means</td>
<td>2</td>
<td>344.1392</td>
<td></td>
</tr>
<tr>
<td>Home Stimulation (with pre Home Stim. as covariate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error within</td>
<td>38</td>
<td>26.84</td>
<td>10.078**</td>
</tr>
<tr>
<td>Difference for testing adjusted means</td>
<td>2</td>
<td>270.55</td>
<td></td>
</tr>
</tbody>
</table>

** p < .001
*** p < .05
TABLE 12

ADJUSTED OUTCOME MEANS:
AS INDICATED BY ANALYSIS OF COVARIANCE

<table>
<thead>
<tr>
<th></th>
<th>Home Visitor Group</th>
<th>Class Group</th>
<th>Class Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Houston</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Original Mean</td>
<td>-0.707</td>
<td>-2.342</td>
<td>-4.4714</td>
</tr>
<tr>
<td>Adjusted Mean</td>
<td>-1.2189</td>
<td>-2.4871</td>
<td>-3.8154</td>
</tr>
<tr>
<td>(with pre Houston as covariate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Home Stimulation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Original Mean</td>
<td>38.429</td>
<td>31.785</td>
<td>27.000</td>
</tr>
<tr>
<td>Adjusted Mean</td>
<td>37.526</td>
<td>30.110</td>
<td>29.577</td>
</tr>
<tr>
<td>(with pre Home Stim. as covariate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bayley Motor</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Original Mean</td>
<td>107.21</td>
<td>100.3</td>
<td>96.5</td>
</tr>
<tr>
<td>Adjusted Mean</td>
<td>103.39</td>
<td>105.17</td>
<td>95.66</td>
</tr>
<tr>
<td>(with pre Bayley Motor as covariate)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
significant source of variance on the outcome measure. 
\((F = 2.199, p < .10)\). (See table 12 for adjusted outcome
means). This result suggests that the significant
difference found on the outcome Houston scores between
the HV and Control groups was due to a difference in base-
line Houston test scores and not due to the intervention.

2. HV group infants scored significantly higher on
the Bayley Motor Scale than did Control group
infants. \((t = 3.035, p < .005)\).

Analysis of covariance (See Table 11) partialling out
the affect of significant differences on baseline Bayley
Motor scores revealed a significant source of variation.
\((F = 5.751, p < .05)\). Adjusted outcome means (See Table 12)
suggest that the class group infants demonstrated the
highest outcome motor scores.

3. HV group mothers scored significantly higher on
the Inventory of Home Stimulation than did
Class group mothers, \((t = 2.697, p < .013)\), or
Control group mothers. \((t = 4.401, p < .0001)\).

Analysis of covariance partialling out the effect
of differences in baseline home stimulation scores, still
yielded significant results at the .001 level. \((F = 10.028)\).

Analysis of variance of subscale outcome home stimulation
scores revealed significant sources of variation on the
Emotional and verbal responsivity of the mother,
the Organization of the environment, the Provision of appropriate play materials, the Maternal involvement with the child, and on Opportunities for variety in daily routine. (See Table 13). Analysis of covariance (See Table 15 for analysis of covariance and Table 16 for adjusted subscale means) supported the analysis of variance for all factors with the exception of the Organization of the environment. t-tests (See Table 14) revealed the following differences between the outcome subscale means of the Inventory of Home Stimulation.

1. The HV group scored significantly higher than the Control group on the Emotional and verbal responsivity of the mother. \((t = 3.202, p < .005)\).

2. The HV group scored significantly higher on the Provision of appropriate play materials than did the Control group, \((t = 4.943, p < .001)\) or the Class group. \((t = 2.33, p < .032)\).

3. The HV group scored significantly higher than the Control group on Maternal involvement with the child, \((t = 4.674, p < .001)\), and the Class group. \((t = 2.496, p < .02)\).

4. The HV group scored significantly higher on Opportunities for variety in daily routine than did the Control group, \((t = 4.610, p < .001)\), or the Class group. \((t = 3.459, p < .003)\).
TABLE 13
ANALYSIS OF VARIANCE: OUTCOME HOME STIMULATION SUBSCALE SCORES

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional and verbal responsivity of mother</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>22.03</td>
<td>4.672*</td>
</tr>
<tr>
<td>within groups</td>
<td>39</td>
<td>4.72</td>
<td></td>
</tr>
<tr>
<td>Avoidance of restriction and punishment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>3.72</td>
<td>0.932</td>
</tr>
<tr>
<td>within groups</td>
<td>39</td>
<td>3.98</td>
<td></td>
</tr>
<tr>
<td>Organiz. of Env.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>2.166</td>
<td>2.501</td>
</tr>
<tr>
<td>within groups</td>
<td>39</td>
<td>0.866</td>
<td></td>
</tr>
<tr>
<td>Provision of appropriate play mat.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>34.57</td>
<td>9.500**</td>
</tr>
<tr>
<td>within groups</td>
<td>39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal involvement with child</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>20.738</td>
<td>9.686**</td>
</tr>
<tr>
<td>within groups</td>
<td>39</td>
<td>2.14</td>
<td></td>
</tr>
<tr>
<td>Opportunities for variety in daily rout.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>between groups</td>
<td>2</td>
<td>9.809</td>
<td>8.927**</td>
</tr>
<tr>
<td>within groups</td>
<td>39</td>
<td>1.099</td>
<td></td>
</tr>
</tbody>
</table>

*p < .01
**p < .001
<table>
<thead>
<tr>
<th></th>
<th>Home Visitor</th>
<th>Class</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emotional and verbal responsivity of mother</strong></td>
<td>Mean</td>
<td>10.36</td>
<td>8.93</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>1.34</td>
<td>2.37</td>
</tr>
<tr>
<td>t between HV and Control = 3.202, p &lt; .005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Provision of appropriate play materials</strong></td>
<td>Mean</td>
<td>7.79</td>
<td>6.214</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>1.05</td>
<td>2.29</td>
</tr>
<tr>
<td>t between HV and Control = 4.943, p &lt; .0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t between HV and Class = 2.331, p &lt; .032</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maternal involvement with child</strong></td>
<td>Mean</td>
<td>4.57</td>
<td>3.214</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>1.223</td>
<td>1.626</td>
</tr>
<tr>
<td>t between HV and Control = 4.674, p &lt; .0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t between HV and Class = 2.496, p &lt; .02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Opportunities for variety in daily routine</strong></td>
<td>Mean</td>
<td>4.43</td>
<td>3.143</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>0.51</td>
<td>1.29</td>
</tr>
<tr>
<td>t between HV and Control = 4.610, p &lt; .0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t between HV and Class = 3.459, p &lt; .003</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 15

**ANALYSIS OF COVARIANCE:**
**AS INDICATED BY ANALYSIS OF VARIANCE**
**FOR OUTCOME HOME STIMULATION SUBSCALE SCORES**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional and verbal responsivity of mother (with baseline score as covariate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error within                                                         38</td>
<td>3.8459</td>
<td>4.125*</td>
<td></td>
</tr>
<tr>
<td>Difference for testing adjusted means                                2</td>
<td>15.8655</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provision of appropr. play materials (with baseline score as cov.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error within                                                         38</td>
<td>2.8677</td>
<td>10.324**</td>
<td></td>
</tr>
<tr>
<td>Difference for testing adjusted means                                2</td>
<td>29.6057</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal involvement with child (with baseline score as cov.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error within                                                         38</td>
<td>1.4104</td>
<td>9.276**</td>
<td></td>
</tr>
<tr>
<td>Difference for testing adjusted means                                2</td>
<td>13.0819</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opportunities for variety in daily rout. (with baseline score as covariate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error within                                                         38</td>
<td>0.8177</td>
<td>9.925**</td>
<td></td>
</tr>
<tr>
<td>Difference for testing adjusted means                                2</td>
<td>8.1155</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .01  
**p < .001
TABLE 16

ADJUSTED OUTCOME MEANS FOR HOME STIMULATION SUBSCALE SCORES: AS INDICATED BY ANALYSIS OF COVARIANCE

<table>
<thead>
<tr>
<th></th>
<th>Home Visitor Group</th>
<th>Class Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional and verbal responsivity of mother</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Original Mean</td>
<td>10.357</td>
<td>8.923</td>
<td>7.857</td>
</tr>
<tr>
<td>Adjusted Mean</td>
<td>10.217</td>
<td>8.826</td>
<td>8.099</td>
</tr>
<tr>
<td>Provision of appropriate play materials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Original Mean</td>
<td>7.7857</td>
<td>6.2143</td>
<td>4.6429</td>
</tr>
<tr>
<td>Adjusted Mean</td>
<td>7.7764</td>
<td>5.9816</td>
<td>4.8849</td>
</tr>
<tr>
<td>Maternal involvement with the child</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Original Mean</td>
<td>4.5714</td>
<td>3.214</td>
<td>2.143</td>
</tr>
<tr>
<td>Adjusted Mean</td>
<td>4.4332</td>
<td>2.7996</td>
<td>2.696</td>
</tr>
<tr>
<td>Opportunities for variety in daily routine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Original Mean</td>
<td>4.427</td>
<td>3.143</td>
<td>2.857</td>
</tr>
<tr>
<td>Adjusted Mean</td>
<td>4.357</td>
<td>3.000</td>
<td>3.072</td>
</tr>
</tbody>
</table>
Analyses revealed hypothesis one could be accepted with regard to home stimulation scores. This was especially evident for the factors of Emotional responsivity of the mother, the Provision of appropriate play materials, Maternal involvement with the child, and Opportunities for variety in daily routine.

Differences Between Baseline and Outcome Measures on Maternal and Infant Variables

t-tests for correlated means were utilized to test hypothesis two and determine if there were any significant differences between baseline and outcome measures for the three groups combined and within each individual group. (See Tables 17 and 18).

Combined Group

1. There was a reduction on the total How I See Myself Scale, Social-Males subscale score, indicating some loss of self-esteem. \( t = 2.82, p < .007 \).

2. There was an increase on the Inventory of Home Stimulation. \( t = 3.11, p < .003 \).

Home-Visitor Group

1. There was a significant increase from the baseline to the outcome Houston Language Development score. \( t = 2.39, p < .033 \).

2. There was a significant increase on the Inventory of Home Stimulation. \( t = 6.23, p < .0001 \).

a. There was a significant increase on the
### Table 17

**t-Tests for Significant Differences Between Baseline and Outcome Scores, For Combined Groups and Within Each Individual Group**

(t-tests for correlated means)

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Combined Groups</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How I See Myself</td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td>Social Male Subscale</td>
<td>37.50</td>
<td>35.60</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>t = 2.82, p &lt; .007</td>
</tr>
<tr>
<td>Home Visitor Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Houston</td>
<td>Mean</td>
<td>-1.9357</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.06</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.32</td>
</tr>
<tr>
<td></td>
<td>t = 2.01, p &lt; .033</td>
<td></td>
</tr>
<tr>
<td>Bayley Mental Score</td>
<td>Mean</td>
<td>102.3</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>16.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12.7</td>
</tr>
<tr>
<td></td>
<td>t = 2.01, p &lt; .10</td>
<td></td>
</tr>
<tr>
<td>Home Stim. Inv.</td>
<td>Mean</td>
<td>30.57</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>4.62</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.34</td>
</tr>
<tr>
<td></td>
<td>t = 6.23, p &lt; .0001</td>
<td></td>
</tr>
<tr>
<td><strong>Class Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bayley Mental Score</td>
<td>Mean</td>
<td>98.86</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>16.14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20.64</td>
</tr>
<tr>
<td></td>
<td>t = 2.05, p &lt; .10</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 17 (cont.)

<table>
<thead>
<tr>
<th>Control Group</th>
<th>BASELINE</th>
<th>OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayley Motor Score</td>
<td>Mean</td>
<td>105.21</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>10.24</td>
</tr>
<tr>
<td></td>
<td>t = 4.71, p &lt; .0001</td>
<td></td>
</tr>
</tbody>
</table>
TABLE 18

\[ t \text{-tests for significant differences between baseline and outcome home stimulation subscale scores within group (} t \text{-tests for correlated means) \]

<table>
<thead>
<tr>
<th></th>
<th>BASELINE</th>
<th>OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HOME VISITOR GROUP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional and verbal</td>
<td>Mean 9.00</td>
<td>10.357</td>
</tr>
<tr>
<td>responsivity of mother</td>
<td>SD 1.24</td>
<td>1.336</td>
</tr>
<tr>
<td></td>
<td>( t = 3.80, \ p &lt; .002 )</td>
<td></td>
</tr>
<tr>
<td>Provision of appropriate</td>
<td>Mean 5.643</td>
<td>7.786</td>
</tr>
<tr>
<td>play materials</td>
<td>SD 1.59</td>
<td>1.051</td>
</tr>
<tr>
<td></td>
<td>( t = 4.59, \ p &lt; .001 )</td>
<td></td>
</tr>
<tr>
<td>Maternal involvement</td>
<td>Mean 2.500</td>
<td>4.57</td>
</tr>
<tr>
<td>with the child</td>
<td>SD 1.16</td>
<td>1.22</td>
</tr>
<tr>
<td></td>
<td>( t = 6.79, \ p &lt; .0001 )</td>
<td></td>
</tr>
<tr>
<td>Opportunities for</td>
<td>Mean 3.00</td>
<td>4.43</td>
</tr>
<tr>
<td>variety in daily routine</td>
<td>SD 0.78</td>
<td>0.51</td>
</tr>
<tr>
<td></td>
<td>( t = 5.26, \ p &lt; .0001 )</td>
<td></td>
</tr>
<tr>
<td><strong>CLASS GROUP</strong> - No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>significant changes</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CONTROL GROUP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal involvement</td>
<td>Mean 1.43</td>
<td>2.143</td>
</tr>
<tr>
<td>with the child</td>
<td>SD 1.28</td>
<td>1.512</td>
</tr>
<tr>
<td></td>
<td>( t = 3.24, \ p &lt; .006 )</td>
<td></td>
</tr>
</tbody>
</table>
Emotional and verbal responsivity of the mother. \((t = 3.80, p < .002)\).

b. There was a significant increase on the Provision of appropriate play materials. \((t = 4.59, p < .001)\).

c. There was a significant increase on Maternal Involvement with the child. \((t = 6.79, p < .0001)\).

d. There was a significant increase on Opportunities for variety in daily routine. \((t = 5.26, p < .0001)\). (See Table 18 for subscale analysis).

**Class Group**

There were no significant differences found between baseline and outcome measures.

**Control Group**

1. There was a significant decrease on the Bayley Motor scores. \((t = 4.71, p < .0001)\).

2. There was a significant increase on the Maternal involvement with the child factor of the Inventory of Home Stimulation. \((t = 3.24, p < .006)\).

Hypothesis two can be accepted partially. There were significant increases found within the Home Visitor group on two measures, while no significant changes were found in the Class group and some decreases were found in the Control group.
Differences Between Two Experimental Groups on Tape Recorded Variables

_t_-tests to determine significant differences between the two experimental groups were utilized to test hypothesis three and revealed the following: (See Table 19).

1. Mothers in the Class group punished their infants slightly more during trial I than did mothers in the HV group. \( t = 1.78, p < .05 \).

2. Infants in the Class group said more words other than the word being taught on trial I than infants in the HV group. \( t = 1.80, p < .05 \).

3. Infants in the Class group spent significantly more time cooing and laughing on trial I than did infants in the HV group. \( t = 1.83, p < .05 \).

4. Infants in the Class group cried and fussed significantly more on trial II than did infants in the HV group. \( t = 1.84, p < .05 \).

Effectiveness of Mothers on Tape Recordings and the Relationship of Tape Measures to Intervention Outcome Variables

Hypotheses five and six were tested by using correlations. Correlations were utilized to determine which behaviors of the combined group of 28 experimental group mothers seemed to be most related to eliciting verbal behavior from the infant during the taping session. Correlations were also utilized to determine if maternal behavior during taping was related to any of the maternal
TABLE 19
MEANS ON TAPE RECORDED RESPONSE VARIABLES
AND t-TEST ANALYSES FOR SIGNIFICANT DIFFERENCES
BETWEEN TWO EXPERIMENTAL GROUPS

<table>
<thead>
<tr>
<th></th>
<th>Home Visitor</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td>Number of times</td>
<td>.42</td>
<td>.93</td>
</tr>
<tr>
<td>mother negatively</td>
<td>.17</td>
<td>.221</td>
</tr>
<tr>
<td>reinforces child (Trial I)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amount of time</td>
<td>1.36 sec.</td>
<td>2.9 sec.</td>
</tr>
<tr>
<td>baby laughs or</td>
<td>.38</td>
<td>.76</td>
</tr>
<tr>
<td>coos (Trial I)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amount of time</td>
<td>1.64 sec.</td>
<td>4.57 sec.</td>
</tr>
<tr>
<td>baby spent fussing or</td>
<td>.54</td>
<td>1.49</td>
</tr>
<tr>
<td>crying ( Trial II)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of other words</td>
<td>.2143</td>
<td>1.0714</td>
</tr>
<tr>
<td>baby said (Trial I)</td>
<td>.579</td>
<td>1.685</td>
</tr>
<tr>
<td></td>
<td>t = 1.78, p .05</td>
<td></td>
</tr>
<tr>
<td></td>
<td>t = 1.83, p .05</td>
<td></td>
</tr>
<tr>
<td></td>
<td>t = 1.84, p .05</td>
<td></td>
</tr>
<tr>
<td></td>
<td>t = 1.80, p .05</td>
<td></td>
</tr>
</tbody>
</table>
personality variables or the level of stimulation in the home.

Intercorrelations Among Tape Variables

1. The number of times the mother said the word was positively related to the number of times the infant approximated the word during trial I (0.3258, p < 0.045), to the examiner rating of maternal warmth (0.4158, p < 0.05), and negatively related to the number of times she punished the infant (−0.3509, p < 0.034).

2. The number of times the mother said the word alone, not in combination with other words was positively related to the number of times the infant said the desired word (0.4377, p < 0.01, Trial I; 0.4269, p < 0.01, Trial II) and was negatively related to the amount of time the infant spent crying. (−0.4007, p < 0.017, Trial I).

3. The number of times the mother said the word in combination with other words was positively related to the amount of time the infant spent crying. (0.3292, p < 0.044, Trial II).

4. The number of times the mother positively reinforced the infant was positively related to the number of times the infant approximated the word (0.4317, p < 0.011, Trial I; 0.4391, p < 0.010, Trial II), to the number of times the infant said other syllables (0.3995, p < 0.018, Trial I; 0.4469, p < 0.009, Trial II), to the number of times the infant said other words (0.6364, p < 0.001, Trial), to the amount of time the
infant spent laughing (.3735, p<.025, Trial I) and to the rating of maternal warmth (.3729, p<.025, Trial I; .5424, p<.001, Trial II). Positive reinforcement was negatively related to the amount of time the infant spent crying or fussing. (-.4624, p<.007, Trial I; -.3629, p<.029, Trial II).

5. The number of times the mother punished the child was positively related to the number of extraneous, irrelevant comments she made during the session (.5339, p<.001, Trial II) and was negatively related to the examiner rating of maternal warmth (-.5751, p<.001, Trial I; -.3995, p<.018, Trial II).

6. The amount of time the mother was silent during the session was negatively related to the number of times the infant approximated the desired word (-.3267, p<.045, Trial I) and was positively related to the number of extraneous comments she made during the session (.4646, p<.006, Trial I).

Relationship of Maternal Tape Behavior to Maternal Personality Variables and to Home Stimulation

1. The number of times the mother said the word alone was positively related to the maternal self-concept score (.3720, p<.026, Trial I; .4382, p<.01, Trial II).

2. The number of times the mother said the word in combination with other words was positively related to an
external locus of control (.4819, p< .004, Trial I; .4989, p< .003, Trial II) and was negatively related to the self-concept score (-.3475, p< .035, Trial II) and to the change in the home stimulation score (-.3404, p< .038, Trial I).

3. The number of times the mother positively reinforced the child on Trial II was positively related to the change in the home stimulation score (.4010, p< .017).

4. The number of times the mother punished the child was negatively related to the outcome home stimulation score (-.3184, p< .049, Trial I).

There are some data to support hypotheses five and six, however the subtleties are inconsistent and will be discussed in more detail in a later section.

Relationship of Baseline Maternal Variables to Infant Change and Outcome Scores in the Two Experimental Groups

Correlations were utilized to test hypothesis seven to determine if any baseline maternal variables were predictive of success in either of the two intervention programs.

Home-Visitor Group

1. The baseline self-concept score was positively related to the infants' outcome Bayley motor score (.833, p< .001) but was negatively related to the change in the Bayley mental score (-.4717, p< .044).

Class Group

1. Mother's intelligence was positively related to
104

the outcome infant Bayley mental score. (.4739, p(.043).

2. The baseline self-concept score was positively related to the outcome Houston language score (.4912, p<.037) and the change in the Bayley motor score (.5767, p<.015).

Relationship of Changes in Maternal Variables to Outcome
Changes in Infant Variables in the Two Experimental Groups

Correlations were utilized to test hypothesis eight to determine if changes on maternal variables were related to changes on infant variables.

Home Visitor Group

1. The change in the home stimulation score was positively related to the change in the Houston language score (.6402, p<.011) and to the change in the Bayley mental score (.4917, p<.037).

Class Group

1. The change in the home stimulation score was positively related to the outcome Houston language score (.4621, p<.048) and to the outcome Bayley mental score (.4479; p<.054).

The Relationship of Maternal Intelligence to Success in Each of the Two Intervention Groups

It was hypothesized that intelligence of the mother would be a more important factor for change in the mothers and infants in the programs for the class group mothers than for the home visitor group mothers. Mothers in the class would have to be somewhat more developed cognitively
in order to generalize and absorb the materials in the classes and apply the principles learned to their children at home. This was partially supported by the following data.

1. The home visitor mother's intelligence was correlated .6752 with the baseline home stimulation score, however this correlation fell to .4476 with the outcome home stimulation score. The class group mother's intelligence was correlated .5010 with the baseline home stimulation score which increased to .7517 with the outcome home stimulation score.

Thus, in the class group, maternal intelligence had become more related to home stimulation but in the home visitor group the relationship had become less significant. This suggested that perhaps mothers in the home visitor group had absorbed the materials in spite of low intelligence and that the home stimulation score varied independently of maternal intelligence. However, in the class group, maternal intelligence and home stimulation became more related, a change in home stimulation dependent perhaps on higher intelligence.

The following analysis was performed to look at this finding more closely. Each experimental group was divided in half on the basis of maternal intelligence, yielding four groups: 1) High intelligence-home visitor group, 2) Low intelligence-home visitor group, 3) High intelligence-class group, and 4) Low intelligence-class group.
Analysis of variance were utilized to determine significant sources of variance among these four groups on the following variables: 1) Outcome Houston score, 2) Change in the Houston score, 3) Outcome Bayley mental score, 4) Change in the Bayley mental score, 5) Outcome home stimulation score, and 6) Change in the home stimulation score. (See Table 20). The analysis of variance revealed that there was a significant source of variation among the four groups on the outcome Houston score, the outcome home stimulation score, and the change in the home stimulation score. t-tests (see Table 21) to determine significance between the means of the four groups for these variables revealed the following:

1. There was a significant difference between the first three groups and the fourth group on the outcome Houston score, the high intelligence-HV, low intelligence-HV, and high intelligence-class groups all scoring significantly higher than the low intelligence-class group.

2. There was a significant difference between the first three groups and the fourth group on the outcome home stimulation scores, the high intelligence-HV, low intelligence-HV, and high intelligence-class groups all scoring significantly higher than the low intelligence-class group.

2. There were significant differences between the high intelligence-HV and High intelligence-class groups
TABLE 20
ANALYSIS OF VARIANCE FOR FOUR GROUPS: HIGH INTELLIGENCE-HOME VISITOR, LOW INTELLIGENCE-HOME VISITOR, HIGH INTELLIGENCE-CLASS, LOW INTELLIGENCE-CLASS; ON OUTCOME AND CHANGE HOUSTON, BAYLEY MENTAL, AND HOME STIMULATION SCORES

<table>
<thead>
<tr>
<th>Source</th>
<th>df (3, 24)</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houston Outcome</td>
<td></td>
<td>27.554</td>
<td>4.250***</td>
</tr>
<tr>
<td>Houston Change</td>
<td></td>
<td>7.472</td>
<td>1.506</td>
</tr>
<tr>
<td>Bayley Mental Outcome</td>
<td></td>
<td>261.653</td>
<td>0.886</td>
</tr>
<tr>
<td>Bayley Mental Change</td>
<td></td>
<td>100.226</td>
<td>0.797</td>
</tr>
<tr>
<td>Home Stim. Outcome</td>
<td></td>
<td>253.847</td>
<td>9.356*</td>
</tr>
<tr>
<td>Home Stim. Change</td>
<td></td>
<td>169.750</td>
<td>5.305**</td>
</tr>
</tbody>
</table>

*p < .001  
**p < .006  
***p < .015
# Table 21

Mean scores for four groups and t-test analyses for significant differences between groups.

<table>
<thead>
<tr>
<th></th>
<th>1 High Int. Home Visitor</th>
<th>2 Low Int. Home Visitor</th>
<th>3 High Int. Class</th>
<th>4 Low Int. Class</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Houston Outcome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-0.129</td>
<td>-1.286</td>
<td>-0.286</td>
<td>-4.40</td>
</tr>
<tr>
<td>SD</td>
<td>1.96</td>
<td>1.96</td>
<td>3.160</td>
<td>2.24</td>
</tr>
<tr>
<td>t between 3 and 4</td>
<td>2.8099, p &lt; .025</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t between 2 and 4</td>
<td>? .369, p &lt; .05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t between 1 and 4</td>
<td>3.7952, p &lt; .01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Home Stim. Outcome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>41.90</td>
<td>35.857</td>
<td>36.857</td>
<td>26.714</td>
</tr>
<tr>
<td>SD</td>
<td>3.786</td>
<td>5.669</td>
<td>7.244</td>
<td>3.094</td>
</tr>
<tr>
<td>t between 1 and 4</td>
<td>7.7308, p &lt; .001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t between 2 and 4</td>
<td>3.7454, p &lt; .005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t between 3 and 4</td>
<td>3.4068, p &lt; .01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Home Stim. Change</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>8.286</td>
<td>6.571</td>
<td>3.000</td>
<td>-2.857</td>
</tr>
<tr>
<td>SD</td>
<td>5.15</td>
<td>6.729</td>
<td>4.865</td>
<td>5.699</td>
</tr>
<tr>
<td>t between 1 and 3</td>
<td>1.9730, p &lt; .05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t between 1 and 4</td>
<td>3.8366, p &lt; .005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t between 2 and 4</td>
<td>2.8289, p &lt; .025</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t between 3 and 4</td>
<td>2.0681, p &lt; .05</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
on change in the home stimulation scores. The high-intelligence-HV group also changed more on this variable than did the low-intelligence-class group and the low intelligence-HV group and the high intelligence-class group also showed a positive change on home stimulation when compared to the low-intelligence-class group.

These results support hypothesis four, suggesting that high intelligence was an advantage in the class group and low intelligence a disadvantage in relationship to the outcome Houston language scores and the outcome and change in the home stimulation scores. However, low intelligence seemed to be a lesser disadvantage in the home visitor group. High intelligence in combination with home visits seemed to be most profitable.

The Relationship of Baseline Variable Scores to Other Baseline Variable Scores

Hypothesis nine concerns the relationship of baseline maternal and infant variables to other baseline maternal and infant variables. Correlations were utilized to test this hypothesis using the total combined group of 42 mothers. (See Table 22).
TABLE 22

PEARSON PRODUCT MOMENT CORRELATIONS FOR BASELINE MATERNAL AND INFANT VARIABLE SCORES*

<table>
<thead>
<tr>
<th>Houston Mental</th>
<th>Bayley Mental</th>
<th>Bayley Motor</th>
<th>PPVT</th>
<th>How I See Myself - Total</th>
<th>Social Reaction Inv.</th>
<th>Comp. Scale</th>
<th>Home Stimulation Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houston Mental</td>
<td>.3646 (.009)</td>
<td>.1708 .1942</td>
<td>.2533 - .130</td>
<td>.0980 .5346</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bayley Mental</td>
<td>.4365 (.002)</td>
<td>-.0151 .2663</td>
<td>.0717</td>
<td>.181 .0573</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bayley Motor</td>
<td>.1042 .1281</td>
<td>.1555 .2973</td>
<td>-.1446 (0.028)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPVT</td>
<td>.2563 (.053)</td>
<td>-.4305 .1810</td>
<td>.5422 (0.001)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HISM Total</td>
<td>-.3012 (.028)</td>
<td>.3829 .0968</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soc. Reac. Inv.</td>
<td>.1297 .2699</td>
<td>(.044)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comp. Scale</td>
<td></td>
<td>.0941</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Stim. Inv.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Level of significance in parentheses
### TABLE 23

**MEAN BASELINE AND OUTCOME SCORES FOR THREE GROUPS**

**COMBINED AND EACH INDIVIDUAL GROUP**

<table>
<thead>
<tr>
<th></th>
<th>COMBINED GROUPS</th>
<th>HOME VISITOR</th>
<th>CLASS</th>
<th>CONTROL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Houston</td>
<td>-2.72</td>
<td>-1.93</td>
<td>-2.5</td>
<td>-3.7</td>
</tr>
<tr>
<td>Bayley Mental Score</td>
<td>102.33</td>
<td>102.28</td>
<td>98.9</td>
<td>105.8</td>
</tr>
<tr>
<td>Bayley Motor Score</td>
<td>103.881</td>
<td>110.50</td>
<td>95.9</td>
<td>105.2</td>
</tr>
<tr>
<td>Peabody Picture Voc.</td>
<td>90.119</td>
<td>95.78</td>
<td>90.6</td>
<td>83.9</td>
</tr>
<tr>
<td>How I See Myself-Total</td>
<td>131.39</td>
<td>139.21</td>
<td>123.4</td>
<td>131.5</td>
</tr>
<tr>
<td>Social Reaction Inv.</td>
<td>9.95</td>
<td>9.9</td>
<td>9.4</td>
<td>10.5</td>
</tr>
<tr>
<td>Competency Scale</td>
<td>1.54</td>
<td>2.8</td>
<td>0.6</td>
<td>1.7</td>
</tr>
<tr>
<td>Home Stim.</td>
<td>29.40</td>
<td>30.6</td>
<td>31.6</td>
<td>26.0</td>
</tr>
<tr>
<td>Outcome</td>
<td>COMBINED GROUPS</td>
<td>HOME VISITOR</td>
<td>CLASS</td>
<td>CONTROL</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------</td>
<td>--------------</td>
<td>-------</td>
<td>---------</td>
</tr>
<tr>
<td>Houston</td>
<td>-2.5</td>
<td>-0.70</td>
<td>-2.3</td>
<td>-4.5</td>
</tr>
<tr>
<td>Bayley Mental Score</td>
<td>106.7</td>
<td>109.42</td>
<td>103.6</td>
<td>107.0</td>
</tr>
<tr>
<td>Bayley Motor Score</td>
<td>101.3</td>
<td>107.21</td>
<td>100.3</td>
<td>96.5</td>
</tr>
<tr>
<td>How I See Myself-Total</td>
<td>128.3</td>
<td>133.57</td>
<td>123.0</td>
<td>128.3</td>
</tr>
<tr>
<td>Social Reaction Inv.</td>
<td>9.8</td>
<td>9.8</td>
<td>9.9</td>
<td>9.9</td>
</tr>
<tr>
<td>Competency Scale</td>
<td>1.6</td>
<td>2.6</td>
<td>1.3</td>
<td>1.1</td>
</tr>
<tr>
<td>Home Stim.</td>
<td>-32.4</td>
<td>38.4</td>
<td>31.8</td>
<td>27.0</td>
</tr>
</tbody>
</table>
CHAPTER IV

DISCUSSION

The present study investigated the effectiveness of two short-term infant stimulation programs. The primary focus in each program was to accelerate language development in the infant by increasing the mother's ability to stimulate the child in the home. Several maternal and infant tests were utilized to assess change due to intervention. Two experimental groups and one control group, each with 14 mothers and infants, were compared on baseline and outcome measures. Each group was also viewed individually to determine significant changes within a group between baseline and outcome scores. Correlations were employed to investigate the relationship of various outcome maternal and infant variables.

Prior to reviewing the results it must be mentioned that some unintended significant differences between the three groups on baseline measures were found. Home visitor mothers seemed to come from families with slightly higher incomes and there were more fathers present in these homes compared to the other two groups. The infants in the home visitor group had higher baseline Houston language scores than did the control group infants and higher baseline motor scores than did the class group infants. Mothers in the home visitor program scored higher on the baseline
self-concept measure than did class group mothers and were more intelligent than control group mothers. Therefore, home visitor group mothers and infants began with some advantages over both groups. Perhaps mothers who voluntarily allowed someone to enter their homes on a weekly basis needed more self-esteem and security concerning themselves, their homes, and their infants than did the mothers coming to the classes. On the baseline level of home stimulation there was no difference between the two experimental groups. Class groups mothers did score higher on the baseline level of home stimulation than did control group mothers, however. Differences on baseline test measures were controlled for statistically when analyzing outcome data.

Several differences were found between the groups and within each of the experimental groups on outcome measures. Preliminary analyses revealed the home visitor infants to have higher outcome language scores, however this result was negated by the analysis of covariance controlling for the effect of significant differences on the baseline language measure. Analysis revealed that there was a significant increase on the Houston language score within the home visitor group, however. Class group infant language scores were fairly stable and control group infant language scores decreased somewhat. Home visits had a definite affect also on the level of home stimulation.
Home visitor group mothers scored significantly higher on outcome home stimulation scores and increased significantly more during intervention than did mothers in either of the other two groups. Subscale analysis of the Inventory of Home Stimulation revealed this difference to be in the factors of emotional responsivity of the mother, the provision of appropriate play materials, the maternal involvement with the child, and opportunities for variety in daily routine. Punishment, restriction, and physical organization of the environment did not seem to be differentially affected in the three groups. There were no significant gains in either the class or control group on the level of home stimulation. Within group analysis revealed also a significant increase on home stimulation within the home visitor group.

Therefore, the home visitor group demonstrated definite gains in the stimulation provided in the home and the infants showed improvement in language. Why were these differences found between the two experimental groups when their curricula were essentially the same? During the home visits, the professional is much more certain of the mother's attention and can be fairly assured that the mother understands what is being said. If something is not understood it can be rephrased. Dealing with a class of ten to twelve mothers was quite different, even when two or three professionals were present. There was often
talking amongst the mothers and one was never sure if a mother understood exactly what was being said. It was the staff's impression that a pilot group of mothers never completely understood, despite our best efforts, what the infant stimulation program was all about. One explanation which could partly explain the differences between the two experimental groups might simply be that the home visitor group mothers were present for a greater number of sessions. The home visitor group averaged 92% attendance while attendance in the class averaged only 69%. However, home visits lasted only ½ hour compared to a two hour class, giving some advantage to the class group in total time seen.

Home visits also afforded much more opportunity for the professional to attend to the infant's behavior and to assess the needs of a particular child. There was much more time to observe the mother-child interaction and to intervene in specific areas, or to go back to an earlier lesson. Personal problems could be touched upon more than during the classes and a closer relationship certainly developed between the professional and the mother during the home visits than during the classes. Two home visitor mothers were very hostile and apathetic towards their children and it was thought that serious marital and family problems were major contributing factors. Solutions to problems were discussed and other agencies were mentioned as possible sources of help to these two mothers. One of
these mothers appeared to make some progress in the program while the other was still quite hostile towards her child after the ten weeks.

Home visits also seemed to provide mothers with a model for effectively stimulating their children. Hunt (1969) suggests that the presence of a model is very important in a successful intervention program. Home visitor mothers could simply repeat what had been done during the home visit while class mothers needed to absorb what had been said during the class and take it home and apply it to their infants. There were demonstrations during the classes but these were probably not as concrete as those actually done in the home situation.

Another critical factor when considering the relative success of either program is the actual similarity of the two curricula. Although the curricula were designed exactly the same in terms of activities and primary discussions concerning the infants and language development, the interpretations and the role of the professional and either the home or class situation were important. The home visitor mothers certainly received a different kind and quality of input than the class mothers. Therefore one may question whether this study can really draw conclusions concerning the relative value of home visits versus classes. However, the differences between the two programs are the very ones which make home programs more effective for some mothers.
One could video tape a curricula and show it to mothers in a class situation and to mothers in the home and then measure the relative effectiveness of each situation. However, research in this area dealing with helping people would not seemingly benefit from that amount of experimental control. The home visits did conform to descriptions of those in other infant stimulation programs while the classes were comparable to other attempts at class intervention. Therefore it seems the results of this study are more applicable to real-life attempts at intervention than if stricter experimental control had been utilized.

The home visits seemed to have had the most affect on language scores and the level of stimulation in the home. There were positive changes on infant intelligence measures in both experimental groups (Home visitor-plus 7 MDI points on the Bayley, Class -plus 5 MDI points) but these increases were not significant statistically. Therefore language was significantly affected in the home visitor group but intelligence of the infant was not. Young (1971) also found the level of stimulation in the home to be highly associated with a three year old child's language development but to have a lesser relationship to the child's intelligence. One might hypothesize that the positive affect on language at the age of one year is significant, as intelligence tests will involve more verbal items as the child grows older. Or perhaps language development is more
susceptible to environmental manipulation than is cognitive development. The positive affects on infant language and the level of home stimulation will perhaps increase scores on future intelligence measures although no immediate affect on measured infant intelligence was found in this study. Hebb (1949) states that there is a necessity of stimulation for the proper hierarchichal development of cell assemblies. Ausubel (1964) argues that those areas not stimulated early would become rigid and less susceptible to stimulation later on. These theorists suggest that if we miss this early critical time for the stimulation of language development, general abilities and performance will be negatively affected as the child matures.

However, one may also argue that the change in infant language scores involves merely a change in performance of the child and does not involve a change in neural structure or in capacity. Lenneberg (1969) contends that a stimulating environment may affect the performance of speech but not affect the normal development of internal structures. Yarrow (1968) suggests that the child's motivation rather than his actual ability may be more affected by deprivation or enrichment. Baratz and Baratz (1970) taking a slightly different view would argue that there is no need to affect performance or capacity as the functioning of the lower class child is different, not deficient, and compares favorable with that of the middle
class child

Whatever of the above views one takes, that we are actually having an affect on capacity or performance, may have little relevance to the success of an intervention program. If we are primarily concerned with one's success in school and with work, and with life in general, increased performance and motivation whether reflective of changed neural structure or not, will definitely be important. Our knowledge with respect to humans can not conclusively demonstrate whether changes in neural structure occurs due to enrichment. Studies with animals suggest that enrichment can affect the brain, but it seems very speculative to apply this to humans. The most critical question is whether the gains demonstrated by any one group will be maintained without continued intense intervention. Hopefully the increased awareness and sensitivity of the mothers reflected in an increased home stimulation score will maintain gains in language. All experimental group mothers are receiving monthly letters until their children are of school age, to remind them of activities they can do at home to teach their child.

There were some positive affects on motor development demonstrated among class group infants. These infants were the only ones to demonstrate a gain on motor scores. Perhaps the gains class group infants made in motor development precluded increases in language. The child
who is too active may have less time for learning language and concepts. Many developmental theorists discuss the spurts of growth in different areas of development occurring at different times in the child's life. Mothers in the class group may have become more interested in their children's development, but may not have picked up the specific techniques aimed at language development. These mothers could have played with their infants more at home and stimulated them in a way to encourage development in the motor area.

In spite of the fact that the class group as a whole showed little affect of intervention, more detailed analysis revealed other results. The home visitor and class groups were both divided in half on the basis of maternal intelligence. Differences on infant outcome variables and home stimulation outcome scores between the four groups were analyzed. There had been some suggestion that maternal intelligence was an important variable for success in the infant stimulation program, especially in the class group.

It was found that mothers of low intelligence in the class group were definitely at a disadvantage. These mothers scored much lower on the outcome home stimulation scores and changed in a negative direction on home stimulation compared to the home visitor group mothers and the mothers of high intelligence in the class.
Infants of mothers in the low intelligence-class group had a final language delay score of -4.4 months, while infants in the other three groups (high intelligence-home visitor, low intelligence-home visitor, and high intelligence-class) did not average more than 1½ months behind on the outcome language measure. Mothers of high intelligence in the class and their infants did demonstrate positive results on some measures. There was a positive change in home stimulation and the infant outcome language scores were essentially the same as the infants of mothers of high intelligence in the home visitor program.

Mothers of high intelligence in the home visitor program were definitely at an advantage, especially in terms of home stimulation. They demonstrated higher outcome home stimulation scores. Mothers of low intelligence in the home visitor group fared well, however, with outcome home stimulation scores much higher than those of mothers of low intelligence in the class group. The low intelligence-home visitor group mothers also showed more positive change on the home stimulation measure than did either of the class group mothers.

These findings suggest that maternal intelligence is a critical factor, especially with intervention attempted in the classroom situation. Mothers of low intelligence in the class seemed to have absorbed little or none of the material presented to them. This did not seem to be due to a fewer number of classes attended by mothers of
low intelligence in the class. Mothers of low intelligence averaged 71% attendance in the class group while mothers of high intelligence in the class attended an average of 66%. Mothers of low intelligence in the class would probably have fared much better in a one-to-one long term home visitor program. The results also suggest that the class can be somewhat successful for mothers of average or above average intelligence. Thus, different types of intervention programs may be successful with mothers of differing intelligence levels. This sample was not large enough and did not have enough mothers with IQ's below 80 to determine if either program was successful with mothers of intelligence that low. Heber (1970) contends that the best method of intervention with infants of mothers with IQ's below 80 is to take the infants out of the home daily and train them intensively with tutors. Young (1971) however, found even mothers of low intelligence could provide high levels of stimulation in the home and positively affect their infants' language development.

Perhaps all this suggests that the highest risk group for future language deficits in the children, and the most difficult group to intervene with, would be mothers of low intelligence also providing low levels of stimulation in the home. Direct, long-term intervention might be necessary to positively affect infants in these homes. Mothers of low intelligence already able to provide high levels of
stimulation may simply benefit from the reinforcement of their techniques and suggestions for new teaching methods in the home. These are the mothers who perhaps will find it easy to stimulate their children early, but will need more help later as the children progress to more abstract levels of cognitive development.

Mothers of high intelligence, regardless of stimulation provided, may benefit from general techniques discussed in a group situation and should better be able to apply these techniques in their own home.

Many studies have found that early stimulation is important to early infant development. Clarke-Stewart (1973) found maternal language to be important as a model and also to be important when directed at the infant. Psarras (1973) deems maternal teaching stimulating techniques, involving labeling, verbal games, questions to clarify needs, and other verbal techniques, to be important factors with infants scoring high on language. Hunt (1969) suggests that the concept of match is critical as mothers need to be sensitive to the level of development their child has reached and challenge him appropriately. There was an attempt to incorporate these factors into the intervention curriculum in this study in order to positively affect the competency of the mothers. Labeling, verbal games, the teaching of words and other general stimulation techniques were discussed in detail and role-played with
the mothers. White (1971) describes the competent mother as one who is spontaneously sensitive to her infant, not overprotective, and very responsive verbally and physically. She provides a variety of stimulating opportunities for the child and encourages exploration and independence.

This literature in context with the results of this study raises several issues. It seems fairly certain that we can teach mothers several specific techniques which will further language development in their young children. However, can we create in these mothers, the sensitivity, the spontaneity, or the awareness of themselves as a teacher that naturally competent mothers seem to possess? Many lower class and/or lower level intelligence mothers seem often to provide adequate and often superior care and stimulation during the first year of the infant's life. These mothers are warm and stimulating and the infants may be advanced in motor development and in making sounds. However, as the infant progresses to preconceptual stages and further to stages involving conceptual development, many of these mothers seem to be at a loss and fail to challenge their children further. Thus, many infants may fall behind at that stage in development. If we are simply affecting short-term techniques in these mothers there is some question as to the long-term maintenance of change. Detailed baseline and outcome observations similar to those undertaken by White (1971) would have to be done to
determine if intervention can actually affect these basic variables.

The critical issue is then what makes a competent mother in the first place. We know what behaviors she demonstrates, but we do not know for sure why one inner city mother is listless and hostile towards her child while another is stimulating and warm. The most obvious answer is the mother's own upbringing and the view others have of her. Self-concept was demonstrated to be an important factor in this study. An additional important factor must be the responsiveness or competency of the infant himself. Wenar (1973) believes that the characteristics of the infant are important in determining the behavioral developmental course of that infant. The mother child pair is critical and competency in each may reinforce competency in the other. Relating this to intervention programs, one might find that some mothers try to apply techniques they have learned but become discouraged because of a nonresponsive infant. The infant may be nonresponsive because he is slow developmentally, a quiet, inactive infant, or because of a previously deficient environment. In these cases an intervention program might be more beneficial if started earlier. Mothers of nonresponsive infants probably need a good deal of reinforcement and intervention must be more intense. There may be some infants that need direct intervention because of their lack of response, similar to that undertaken by Heber (1970).
The issue of nonresponsive infants negatively affecting mothers' success in intervention programs is speculative. More research could be utilized in this area to determine if the competency and responsiveness of the infant is a factor in maternal success in an intervention program.

One purpose of this study was to investigate ways of evaluating intervention programs. The most significant variable was the level of home stimulation. This measure demonstrated the success of the home visitor program and the success of some mothers in the class group. Home stimulation seemed to be a reliable indicator of change due to intervention. Positive changes in the level of home stimulation in the home were related to higher outcome infant language and infant intelligence scores in the class group and to positive changes in infant language and infant intelligence in the home visitor group. Thus, in spite of the fact that significant increases in intelligence were not found in either group, homes which changed the most in home stimulation did have infants with higher language and intelligence outcome scores. The home stimulation measure did seem to be more representative of change than did some of the more traditional measures.

The infant language measure was found to be a sensitive indicator of individual differences and change. However, there are a limited number of verbal abilities available to measure at the one year old level. Perhaps a more sensi-
tive measure of verbal change could be developed, involving the frequency of vocalizations during a one hour observation period. This might more sensitively reflect differences between infants in actual vocalization rates.

The maternal personality variables were quite stable and reflected few affects of intervention. Gordon (1971) suggested that the How I See Myself Scale and the Social Reaction Inventory measured stable personality variables and might show little change over a short period of time. His programs have been more long term and thus provide more opportunity for personality change in the mothers. The Infant Care Inventory, used experimentally by Hock (1972) showed little individual variation. Some of the personality variables were related to other measures and were predictive of change in the infant in some instances.

The measurement of maternal intelligence was found to be a significant factor. It was discussed previously that this measure may be useful as a screening device for selecting mothers for appropriate intervention programs. Mothers' intelligence was also positively related to the baseline measure of home stimulation. It was not related to the baseline infant language or infant intelligence measures, however.

Tape recordings were utilized as outcome measures in the two experimental groups. Few significant differences were found between the two experimental groups on the
tape recorded maternal or infant variables and the tapes were seen as poor discriminators of the relative success of either group. One might hypothesize then that the home visits did not have a specific affect on the mothers in terms of teaching their children a new word. The positive affect on home stimulation and infant language must have been more general.

The tape recordings did yield some interesting findings. Results suggest that the mothers saying the word alone and repeating it several times had children scoring higher on infant language development. Therefore, at this age, a simple and clear technique of teaching new words seemed to be more effective than the use of more varied or complex styles. This agrees with Moerk's (1972) findings that simple, direct methods are more effective at an early age while more complex methods are effective as the child approaches two years of age. Mothers who utilized simpler styles had a higher self-concept. More complex styles were negatively related to changes in infant vocalization on the Houston. Mothers who utilized the complex style tended to have lower self-concepts and to have a more external locus of control. (Complex style was usually many words put together, e.g., "say doggie for mommy," "here's your hat,"). Positive reinforcement by the mother of the infant was as expected related to the infant's vocalizations on the tape and to the mother's self-concept.
Criticisms of the Study

One may question whether any definitive conclusions can be drawn from this study because of the large number of mothers contacted compared to the lower number who actually participated in the programs. Can we really make inroads in relieving poverty and in increasing the level of performance of the lower class child when such a low number of mothers seemed to be interested in the program? Out of 200 mothers contacted, only 28 eventually participated. Perhaps some improved means of interesting lower class mothers in this type of program is needed. It may be found that solid community support of an infant stimulation program is needed before people are trusting enough to participate.

One limitation of this study was the possibility of observer bias during any of the testing sessions involving the experimental group infants. Professionals testing the infants and mothers were also the professionals involved in either of the intervention programs. There were usually two professionals present during testing however and every attempt was made to base judgements exclusively on observations during that testing session. This was especially important in the home visitor group outcome testing sessions as the visitor had become very familiar with the home, the mother, and the infant. Double blind procedures would have been very useful to prevent any observer bias affects.
There were also some limitations on the measures used. The personality measures were not well standardized and proved to be insensitive to change over a short period of time. The use of tape recordings to assess the success of an intervention program has not been used in the past and they proved to be relatively unsuccessful in terms of discriminating between the two experimental groups. However, perhaps baseline measures on the tapes could have been made and compared to outcome tape recordings, demonstrating more of a change. Tape recordings might be better utilized to record a normal mother-child interaction not involving the teaching of a new word.

Implications for Further Research

Several questions remain unanswered about the success of intervention programs. More subtle research is needed involving the success of different types of mothers in different types of intervention programs. What mothers need help, what mothers do not? What is the most effective type of input for which type of mother?

Another issue which seems important is finding out the important factors creating a competent mother. Can we produce in incompetent mothers a comparable level of competency or will changes merely be superficial? Also, what important role does the infant play in maternal competency. One wonders if an incompetent, unresponsive infant may have a debilitating affect on even a motivated mother in
an intervention program. These and many other questions must be answered before the full benefit of infant stimulation projects can be utilized.

Long-term follow-up of the mothers and infants in this study and those in other studies should be done to determine if changes are stable over time. This is especially important because of the low predictability of infant tests. It is important to determine if the change in home stimulation is continued and if it actually does affect the future development of the child.

Conclusions

This study has demonstrated that a short term intervention program based in the home can have a beneficial affect with lower class mothers. Over a three month period there were positive changes in the level of home stimulation and in infant language scores. Intervention with mothers in the class room was not as effective, but results suggest that this was due to the poor performance of low intelligence mothers in the class group. Mothers of higher intelligence and their infants did benefit from the class intervention program in some areas.
APPENDIX A

Letters Sent Out to Recruit Experimental Group Mothers

Class Group Letter

Dear Mother:

Mothers are teachers. They are their baby's first and best teacher. You probably have already taught your baby a great deal, such as waving bye-bye, saying a word or two, playing peek-a-boo and a great many other things.

At Children's Hospital, we are holding a series of "Meetings for Mothers" where we will talk about more and new ways mothers can help their children learn, especially learn to talk. The meetings will be held once a week for a two hour session.

If you are interested, fill in the blanks on the attached form and return it in the enclosed envelope to Children's Hospital.

If you have a friend with a baby around 10 to 14 months old, she is welcome too. All mothers are invited to attend. The meetings are free. We will be able to provide babysitting here at the hospital and, if necessary, transportation. We will call on you at home and tell you more about the meetings if you are interested. If you have questions or need any more information, call us at the Children's Hospital, 253-8841, extension 466.

Sincerely,
Home Visitor Group Letter

Dear Mother:

Mothers are teachers. They are their baby's first and best teacher. You probably have already taught your baby a great deal, such as waving bye-bye, saying a word or two, playing peek-a-boo and a great many other things.

At Children's Hospital we will be visiting mothers and their babies where we will talk about more and new ways mothers can help their children learn, especially learn to talk. We will visit mothers once a week for 10 weeks and each visit will last ½ to 1 hour. We will be able to come any time during the day or in the early evening if you work.

If you are interested, fill in the blanks on the attached form and return it in the enclosed envelope to Children's Hospital.

If you have a friend with a baby around 10 to 14 months old, she is welcome too. The visits are free. We will call on you at home and tell you more about the visits if you are interested. If you have questions or need any more information, call us at the Children's Hospital, 253-8841, extension 466.

Sincerely,

Attached Form

Name: __________________________
Address: ________________________
Phone: _________________________
Baby's Name: ____________________ Birthdate: __________
Best time to call: ________________
Questions you have?
Do you work?
APPENDIX B

Selected Houston Test Items

Six month level

1. Smiles
2. Vocalizes back vowels (Ah, OO)
3. Talks to inanimate objects
4. Attends to voice
5. Blows bubbles
6. Laughs out loud
7. Volume control
8. Squeals
9. Vocal grunt

Twelve-month level

1. Holds out arms to be taken
2. Vocalizes syllables
3. Repeats same syllable
4. Imitates sounds
5. Uses reflexive jargon
6. Will pat-a-cake
7. Uses two words
8. Inhibits on command
9. Responds to "bye-bye"

Eighteen-month level

1. Uses conversational jargon
2. Points to indicate wants
3. Vocabulary of 10 - 17 words (spontaneous)
4. Identifies 3 parts of doll (eyes, mouth, ear, hands)
5. Names at least 1 picture (3x5 cards)
6. Points to pictures (at least 5)
APPENDIX C

HOME STIMULATION INVENTORY

I. Emotional and verbal responsivity of mother

1. Mother spontaneously vocalizes to child at least twice during visit (excluding scolding).

2. Mother responds to child's vocalizations with a verbal response.

3. Mother tells child the name of some object during visit or says name of person in a "teaching style".

4. Mother's speech is distinct, clear, and audible.

5. Mother initiates verbal interchanges with observer - asks questions, makes spontaneous comments.

6. Mother expresses ideas freely and easily and uses statements of appropriate length for conversation (e.g., gives more than brief answers).

*7. Mother permits child occasionally to engage in "messy" types of play.

8. Mother spontaneously praises child's qualities or behavior twice during visit.

9. When speaking of or to child, mother's voice conveys positive feeling.

10. Mother caresses or kisses child at least once during visit.

11. Mother shows some positive emotional responses to praise of child offered by visitor.

II. Avoidance of restriction and punishment

12. Mother does not shout at child during visit.

13. Mother doesn't express overt annoyance with or hostility toward child.

14. Mother neither slaps nor spanks child during visit.

*15. Mother reports that no more than one instance of physical punishment occurred during the past week.
16. Mother does not scold or derogate child during visit.

17. Mother does not interfere with child's actions or restrict child's movements more than three times during visit.

18. At least ten books are present and visible.

19. Family has a pet.

III. Organization of physical and temporal environment

20. When mother is away, care is provided by one of three regular substitutes.

21. Someone takes child into grocery store at least once a week.

22. Child gets out of house at least four times a week.

23. Child is taken regularly to doctor's office or clinic.

24. Child has a special place in which to keep his toys and treasures.

25. Child's play environment appears safe and free of hazards.

IV. Provision of appropriate play materials

26. Child has some muscle activity toys or equipment.

27. Child has push or pull toy.

28. Child has stroller or walker, kiddie car, scooter, or tricycle.

29. Mother provides toys or interesting activities for child during interview.

30. Provides learning equipment appropriate to age—mobile, table and chairs, high chair, play pen.

31. Provides learning equipment appropriate to age—cuddly toy or role-playing toys.
32. Provides eye-hand coordination toys—items to go in and out of receptacle, fit together toys, beads.

33. Provides eye-hand coordination toys that permit combinations—stacking or nesting toys, blocks, or building toys.

34. Provides toys for literature and music.

V. Maternal involvement with child.

35. Mother tends to keep child within visual range and to look at him often.

36. Mother "talks" to child while doing her work.

37. Mother consciously encourages developmental advance.

38. Mother invests "maturing" toys with value via her attention.


40. Mother provides toys that challenge child to develop new skills.

VI. Opportunities for variety in daily stimulation.

41. Father provides some caretaking every day.

42. Mother reads stories at least three times weekly.

43. Child eats at least one meal per day with mother and father.

44. Family visits or receives visits from relatives.

45. Child has three or more books of his own.

(* Items which may require direct questions)

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APPENDIX D

Social Reaction Inventory

I more strongly believe that:

1. a. Children get into trouble because their parents punish them too much.
   b. The trouble with most children nowadays is that their parents are too easy with them.

2. a. Many of the unhappy things in people's lives are partly due to bad luck.
   b. People's misfortunes result from the mistakes they make.

3. a. One of the major reasons why we have wars is because people don't take enough interest in politics.
   b. There will always be wars, no matter how hard people try to prevent them.

4. a. In the long run people get the respect they deserve in this world.
   b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.

5. a. The idea that teachers are unfair to students is nonsense.
   b. Most student's don't realize the extent to which their grades are influenced by accidental happenings.

6. a. Without the right breaks one cannot be an effective leader.
   b. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. a. No matter how hard you try some people just don't like you.
   b. People who can't get others to like them, don't understand how to get along with others.

8. a. Heredity plays the major role in determining one's personality.
   b. It is one's experiences in life which determine what they're like.

9. a. I have often found that what is going to happen will happen.
I more strongly believe that:

b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

10. a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.
   b. Many times exam questions tend to be so unrelated to course work, that studying is really useless.

11. a.

b. Getting a good job depends mainly on being in the right place at the right time.

12. a. The average citizen can have an influence in government decisions.
   b. This world is run by the few people in power, and there is not much the little guy can do about it.

13. a. When I make plans, I am almost certain that I can make them work.
   b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

14. a. There are certain people who are just no good.
   b. There is some good in everybody.

15. a. In my case getting what I want has little or nothing to do with luck.
   b. Many times we might just as well decide what to do by flipping a coin.

16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
   b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.

17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control.
   b. By taking an active part in political and social affairs the people can control world events.

18. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
   b. There really is no such thing as "luck."
I more strongly believe that:

19. a. One should always be willing to admit his mistakes.
   b. It is usually best to cover up one's mistakes.

20. a. It is hard to know whether or not a person really likes you.
   b. How many friends you have depends upon how nice a person you are.

21. a. In the long run the bad things that happen to us are balanced by the good things.
   b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22. a. With enough effort we can wipe out political corruption.
   b. It is difficult for people to have much control over the things politicians do in office.

23. a. Sometimes I can't understand how teachers arrive at the grades they give.
   b. There is a direct connection between how hard I study and the grades I get.

24. a. A good leader expects people to decide for themselves what they should do.
   b. A good leader makes it clear to everybody what their jobs are.

25. a. Many times I feel that I have little influence over the things that happen to me.
   b. It is impossible for me to believe that chance or luck plays an important role in my life.

26. a. People are lonely because they don't try to be friendly.
   b. There's not much use in trying too hard to please people, if they like you, they like you.

27. a. There is too much emphasis on athletics in high school.
   b. Team sports are an excellent way to build character.

28. a. What happens to me is my own doing.
   b. Sometimes I feel that I don't have enough control over the direction my life is taking.

29. a. Most of the time I can't understand why politicians behave the way they do.
   b. In the long run the people are responsible for bad government on a national as well as on a local level.

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APPENDIX E

How I See Myself Scale

1. Nothing gets me too mad 1 2 3 4 5 I get mad easily and explode

2. I don't stay with things and finish them 1 2 3 4 5 I stay with something till I finish

3. I'm very good at drawing 1 2 3 4 5 I'm not much good at drawing

4. I don't like to work with others 1 2 3 4 5 I like to work with others

5. I wish I were smaller (taller) 1 2 3 4 5 I'm just the right height

6. I worry a lot 1 2 3 4 5 I don't worry much

7. I wish I could do something with my hair 1 2 3 4 5 My hair is nice-looking

8. Teachers like me 1 2 3 4 5 Teachers don't like me

9. I've lots of energy 1 2 3 4 5 I haven't much energy

10. I am ignored at parties 1 2 3 4 5 I am a hit at parties

11. I'm just the right weight 1 2 3 4 5 I wish I were heavier (lighter)

12. Women don't like me 1 2 3 4 5 Women like me a lot

13. I'm very good at speaking before a group 1 2 3 4 5 I'm not much good at speaking before a group

14. My face is pretty (good looking) 1 2 3 4 5 I wish I were prettier (good looking)

15. I'm very good in music 1 2 3 4 5 I'm not much good in music

16. I get along well with teachers 1 2 3 4 5 I don't get along with teachers
<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. I don't like teacher</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>18. I don't feel at ease, comfortable inside myself</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>19. I don't like to try new things</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>20. I have trouble controlling my feelings</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>21. I did well in school work</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>22. I want men to like me</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>23. I don't like the way I look</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>24. I don't want other women to like me</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>25. I'm very healthy</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>26. I don't dance well</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>27. I write well</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>28. I like to work alone</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>29. I use my time well</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>30. I'm not much good at making things with my hands</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>31. I wish I could do something with my skin</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>32. School was never interesting to me</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

I like teachers very much
I feel very at ease, comfortable inside myself
I like to try new things
I can handle my feelings.
I didn't do well in school
I don't want men to like me
I like the way I look
I want other women to like me
I get sick a lot
I'm a very good dancer
I don't write well
I don't like to work alone
I don't know how to plan my time
I'm very good at making things with my hands
My skin is nice-looking
When I was in school it was interesting to me
33. I don't do my housework well 1 2 3 4 5 I do a good job at housework
34. I'm not as smart as the others 1 2 3 4 5 I'm smarter than most of the others
35. Men like me a lot 1 2 3 4 5 Men don't like me
36. My clothes are not as I'd like 1 2 3 4 5 My clothes are nice
37. I liked school 1 2 3 4 5 I didn't like school
38. I wish I were built like others 1 2 3 4 5 I'm happy with the way I am built
39. I don't read well 1 2 3 4 5 I read very well
40. I don't learn new things easily 1 2 3 4 5 I learn new things easily

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APPENDIX F

Infant Care Inventory

Select the one person in each pair that you feel could **show affection to your baby better**.

YOURSELF ( ) OR ( ) BABY'S GRANDMOTHER

BABY'S GRANDMOTHER ( ) OR ( ) DAY CARE TEACHER

EXPERIENCED BABY SITTER ( ) OR ( ) FATHER

DAY CARE TEACHER ( ) OR ( ) YOURSELF

PEDIATRIC NURSE ( ) OR ( ) EXPERIENCED BABY SITTER

BABY'S GRANDMOTHER ( ) OR ( ) FATHER

DAY CARE TEACHER ( ) OR ( ) FATHER

EXPERIENCED BABY SITTER ( ) OR ( ) BABY'S GRANDMOTHER

FATHER ( ) OR ( ) YOURSELF

PEDIATRIC NURSE ( ) OR ( ) DAY CARE TEACHER

YOURSELF ( ) OR ( ) EXPERIENCED BABY SITTER

PEDIATRIC NURSE ( ) OR ( ) BABY'S GRANDMOTHER

FATHER ( ) OR ( ) PEDIATRIC NURSE

EXPERIENCED BABY SITTER ( ) OR ( ) DAY CARE TEACHER

YOURSELF ( ) OR ( ) PEDIATRIC NURSE
Infant Care Inventory (cont.)

The preceding page was repeated with the people mentioned in varied order with the following statements at the head of the page.

Select the one person in each pair that you feel could better PREPARE YOUR CHILD FOR AND PUT HIM/HER TO BED

Select the one person in each pair that you feel could CALM YOUR BABY BETTER

Select the one person in each pair that you feel could DIAPER YOUR BABY BETTER

Select the one person in each pair that you feel could better UNDERSTAND WHAT YOUR BABY WANTS

Select the one person in each pair that you feel could better TEACH YOUR BABY GAMES SUCH AS "PEEK-A-BOO" OR "PAT-A-CAKE"

Select the one person in each pair that you feel could FEED YOUR BABY BETTER

Select the one person in each pair that you feel could best PROVIDE APPROPRIATE VISUAL AND VERBAL STIMULATION FOR YOUR BABY
APPENDIX G

Social History Questionnaire

The following questions will provide information that will be useful in helping both you and your child. All information will be kept confidential.

1. Name of mother  Age
   Address  Phone
   Where raised  Education
   Occupation

2. Name of head of house  Age
   Relationship to child  Phone
   Home address  Education
   Where raised  Occupation

3. Information on father, if different from above.

4. List other children living in the home:
   Name  Sex  Age  Grade  Relationship to mother

5. Other dependents

6. Others living in the house

7. Type of dwelling: apartment, house, trailer, duplex
   Rent or own
   Number of rooms/number of occupants

8. Do you have pets?

9. Do you have a car? Does mother drive?

10. Total family income:  Under 1,000  4,100 - 5,000
    1,100-2,000  5,100 - 6,000
    2,100-3,000  6,100 - 7,000
    3,100-4,000  Over 7,000

11. Source of income:  Salary
    ADC or welfare
    Other

Questions relating to infant

1. Name of baby  Birthdate  Age

2. Birth history
   Did you have any difficulty with pregnancy?  Describe.
Did you have any difficulty during birth of baby?

Did your baby have any health problems immediately after birth?

Was he premature? How early (in weeks)?

List diseases or illnesses in first year. Include hospitalizations.

3. Please describe the amount of time you spend taking care of your baby for the following activities. Please answer in hours, using your best judgment of an average day. Please do the same for baby's father.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Mother</th>
<th>Father</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diapering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bathing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holding</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Does anyone else spend time with your baby regularly?

5. Was your baby nursed or bottle fed? Please describe early experiences with feeding.

6. Did your baby have any special problems with feeding?
Does he have any feeding problems now?

7. Did you follow a set schedule for early feeding? Do you follow a schedule or routine now?

8. How much time did your baby spend crying when he was just home from the hospital? How did you deal with this? Does he cry often now? Describe how this is handled.

9. Did the baby sleep enough when he was younger? Does he have any sleeping problems now?

10. Do you find time to play with the baby? How much time are you able to spend each day in play? What kinds of things do you like to do with your baby?

11. Does the baby's father spend much time playing with him? Describe what they like to do together.
Questions relating to attitudes

1. Please describe your child's personality. Is she/he active, unhappy, sleepy, happy, etc.?

2. What was your reaction when you found out you were going to have a baby? What was the father's reaction?

3. How has having children changed your life? What things are better? What things are worse?

4. Do you think you pattern yourself after your own mother in the way you take care of your baby? Describe.

5. Are there some things about your baby that we haven't asked, and that you think are important.

6. Are you planning to have any more children? What do you think would be an ideal size family for you?
APPENDIX H

Curriculum For Home Visitor and Class Groups

First Week

The general nature and goal of the program were discussed with the mothers. Mother was stressed in terms of being teacher to baby. The importance of early language to later speech and development was discussed.

Class group mothers saw a movie about early childhood development, discussing developmental milestones of the first year of life. Both groups of mothers were asked to complete a sheet during the session about their baby's development in the following areas: language, social, fine motor, and large motor. These areas were discussed with the mothers so that they would have some idea how much their babies had changed over the three month period and how much they had learned up to that point in time.

Imitation was discussed in terms of getting baby to talk. Mothers were encouraged to imitate their babies' sounds and to try and get baby to imitate them. This was discussed as a game, where baby and mother would imitate each other and laugh. Mothers were encouraged to give lots of reinforcement during the talking sessions ("Good boy," a hug, a kiss, etc.). Mothers themselves were given lots of reinforcement when they tried this with their babies, especially during the home visits. Mothers were asked to practice imitation during the week, both of verbal and motor activities, with their babies.
Second Week

Imitation was again discussed with the mothers. The work sheets they had hopefully completed during the week were discussed. Home visitor mothers practiced the activity again for the home visitor and the importance of lots of reinforcement for the baby was again stressed.

They were asked to try labeling things during the next week during normal daily activities. For example, during bath time they could say "soap" or "water" each day. They were asked to repeat the same words each day during the week.

Mothers were given sheets of paper with the following areas of discipline mentioned: feeding problems, toilet training problems, sibling rivalry problems, temper tantrums, sleeping problems, dependency problems, and any other problems they might have. They were asked to write down any difficulties they had with their babies in these areas and solutions to these problems were discussed during the group meeting or home visit. The importance of being positive towards the child was stressed during this discussion. Alternative methods of discipline besides physical punishment were mentioned.
Third Week

Last week's assignment, labeling, and the mother's success with it was discussed.

Toys were introduced in terms of promoting the following:

1. Eye-hand coordination
2. opportunity for self-expression
3. concept development
4. language development
5. mother-child interaction

Mothers had been asked to bring in materials they had saved from around the house. They spent this session making toys suggested by the group leader or professional, or making toys they thought of on their own. All of the toys were discussed at the end of the session in terms of how they would be used with the babies. The mothers were asked to play with their babies, teaching them how to use the toys, and talking during the play sessions.

Some of the toys the mothers made were:

a. pegboard—made out of toilet paper rolls and egg carton.

b. "putting into" toy—make by cutting small hole in top of pringles can large enough for baby to slip clothes pins through. The cans were covered with contact paper.

c. Shape board—a circle, square, and triangle were cut in top of shoe box. A ball, block, and constructed triangle were given to baby to put through the three holes.
Fourth Week

The toys and work sheets from the third week were discussed. Mothers were asked if playing with the toys encouraged the babies to vocalize. They were encouraged to continue using the toys at home at to make more on their own. The importance of imitation, labeling, and lots of talking in general was again discussed with an emphasis on reinforcing the baby's vocalizations.

During the fourth week puppets were made out of felt, yarn, and buttons. Puppets were discussed in terms of the following:

1. The novelty of the puppet talking may encourage baby to listen more to the words.

2. Puppets can be used as a reinforcement, they can laugh, tickle, and play with baby.

3. Puppets can be used to learn parts of the face- "Where's my nose?"

4. Puppets can stimulate the imagination, especially as baby grows older.

5. Puppets encourage mother and child to play together.

Mothers practiced talking through the puppet with their baby during the home visit and if possible, during the group meeting. She was asked to try and teach baby a new sound or word using the puppet during the following week.
Fifth Week

Puppets and the baby's response to them were discussed. Making books was introduced. Mothers had been asked to bring in old magazines and they were asked to pick out many simple, clear pictures from them (e.g., a large picture of an apple or cat). She pasted each picture to a piece of manila tagboard, tied the pieces together with yarn, and made a cover by covering two pieces of tagboard with contact paper. She was asked to choose pictures of things the baby would be familiar with and that were relatively easy to say.

The mother was asked to look at the book she had made with the baby during the week, choosing a few pictures and words to say and showing the baby the actual object in the environment if possible.

Sixth Week

The books and baby's response to them were discussed. Mothers were asked to continue using the books each week, as well as the toys, and to continue the imitation and labeling.

The sixth week's activity was songs and games. They were discussed in terms of fostering both verbal and motor imitation. Mothers were encouraged to try the following games: pretend talking on the telephone, playing in front of the mirror, Simon Says, follow the leader, kicking and rolling and ball to each other, pat-a-cake, peek-a-boo, and others.
Seventh Week

The seventh week was a review lesson for home visitor mothers. Imitation was again discussed and role-played. The importance of reinforcement was again stressed and the home visitor talked with the mother about the things she had made and how she was using them at home with the baby. She was asked again to practice imitation during the week with her baby, trying to teach him a new word or sound.

A pediatrician addressed the class group during the seventh lesson and answered any questions the mothers had about health problems in general. A discussion was held at the end of this session about past lessons and how things were going at home with the babies.

Eighth Week

Several things were discussed during this session. It was suggested that trips to the laundry, to the grocery store, and to relatives could be utilized to teach baby to talk. The importance of stimulating the different senses was also mentioned and ways of doing this were considered (e.g., some mothers made a book with different textured materials in it—sand paper, cotton, velvet, an S.O.S. pad, etc.). Mothers were given a Golden Book with simple pictures in it to look at with their baby during the week.
Ninth Week

This session was devoted to discussing the general development of the child which would occur until he reached school age, and methods of facilitating this development. Children develop at different rates and it was stressed to the mother that she should try and gauge which things would interest and challenge her child the most. More complex speech, the use of numbers, the learning of shapes and colors, and the development of concepts were among the areas emphasized.

Tenth Week

A representative from Planned Parenthood addressed the class group during this session. Mothers in the home visitor group were offered Planned Parenthood pamphlets concerning birth control and sterilization. This session was also utilized as a catch-up lesson. Mothers in the class group who had missed a session spent their time making a toy, book, or puppet. The time was also spent in both the classes and during the home visits reviewing prior lessons and the importance of language development in general.
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