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# Effects of four different modality training programs on IQ and reading readiness performance in the lower socio-economic level kindergarten child

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EFFECTS OF FOUR DIFFERENT MODALITY  
TRAINING PROGRAMS ON IQ AND READING  
READINESS PERFORMANCE IN THE LOWER  
SOCIO-ECONOMIC LEVEL KINDERGARTEN

CHILD

by

Marilyn Segal

A dissertation submitted to Nova University  
in conformity with the requirements for the  
degree for Doctor of Educational Reserch in  
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1970

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Effects of Four Different Modality Training Programs  
on IQ and Reading Readiness Performance in the  
Lower Socio-Economic Level Kindergarten Child

By

Marilyn Segal

DISSERTATION

Submitted in partial satisfaction of the requirements

for the degree of

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in

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of

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## A B S T R A C T

Four perceptual training programs were incorporated into an individualized kindergarten curriculum for disadvantaged children. One program stressed general auditory and visual perceptual skills, a second auditory skills specific to decoding, a third visual skills specific to decoding, and a fourth auditory and visual skills specific to decoding.

Each of the four treatment groups were taught by the same teachers. Post-tests included IQ, auditory and visual measures of reading readiness, and two learning rate tests, the Murphy-Durrell learning rate test which uses a look-say instructional method, and a parallel learning rate test constructed by the investigator using a linguistic instructional approach.

Although there was a significant difference between groups at the end of the treatment period, no group or groups outperformed the others on all post-test measures. The auditory visual specific skill group registered significantly greater gains than the other three groups on IQ, and scored significantly higher than the auditory group on visual but not auditory reading post-tests. There was no interaction effect between treatment group and IQ level, auditory perception level or visual perception level as measured by the pre-tests. The investigator hypothesized that groups trained in specific visual skills would outperform the others on the Murphy-Durrell Learning rate test, and that the groups trained in specific auditory skills would outperform the others on the Linguistic Learning rate test. This hypothesis was not supported. A trend in the direction of the hypothesis suggested that a longer training period may have produced more definitive results.

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## CHAPTER 1

### INTRODUCTION

Cronbach and Suppes, 1969, rejecting the usual classifications of basic and applied, suggest a different classificatory scheme for educational research. They divide educational research into two major categories, conclusion-oriented and decision-oriented. The conclusion-oriented study, according to the authors, is not planned with an eye to definite and useful outcome. "The main benefit is in the unforeseen ideas it adds to society" (p. 23). Decision-oriented research, on the other hand, seeks to provide information that can be used as the basis of a practice-related decision. The present study comes under the classification of decision-oriented research, in that its main purpose is to furnish information that will provide the basis for a curriculum decision in an educational setting.

A wide variety of reading readiness programs for the lower socioeconomic level (SEL I) black child have been developed in recent years. These programs vary in methodology, content and focus, and reflect divergent opinions as to the need priorities of the SEL I black child. Programs giving the same priority to perceptual training, differ both as to the level of perceptual skills they focus on, and to the relative importance assigned to auditory and visual modality training. The present study is concerned with the evaluation of four different perceptual training programs for the SEL I kindergarten child. It explores the effects of these programs on IQ change and reading readiness measures and provides information that can be used as the basis of a curriculum decision.

## DEFINITIONS USED IN THE STUDY

Visual Perception Skills. All skills that require the ability to recognize, identify, order, and/or interpret visual stimuli. These skills relate to visual motor coordination, figure-ground perception, visual perceptual constancy, spatial orientation, visual discrimination, visual memory, and sequencing.

Auditory Perception Skills. All skills that require the ability to identify, recognize, order, and/or interpret auditory stimuli. These skills related to auditory discrimination, auditory perceptual constancy, figure-ground perception, auditory memory, and sequencing.

Alphabet Perceptual Subskills. Auditory visual perceptual skills that require the interpretation and/or manipulation of separate letter sounds or letter shapes.

Non-alphabet Perceptual Sub-skills. Auditory and visual perceptual skills that do not require the interpretation and/or manipulation of separate letter sounds or letter shapes.

Decoding. Translation of the graphic symbol to the spoken word.

Socio-economic Level I Child: A child from an economically depressed environment where the total family income falls below the poverty index established by the United States Department of Health, Education, and Welfare, 1969.

## CHARACTERISTICS ASSOCIATED WITH THE SEL I CHILD

### 1. Performance Record:

Differences in performance between the SEL I child and the non-SEL I child have been revealed in several areas related to academic performance. These include reaching achievement, reading readiness, language, concept formation, and problem-solving.



Reading Performance. The poor performance of the SEL I child on reading achievement tests has been reported so consistently that it is by now an accepted fact (McCloskey, 1967). Unfortunately, this reading deficit appears to be cumulative, with the SEL I child falling further and further behind as he progresses through the school system (Hanson and Robinson, 1967). Comparing the reading performance of primary grade children of different socio-economic strata, Hanson and Robinson (1967) report that "in comparison to advantaged children, the disadvantaged child evidently enters the primary grades less ready to learn to read, and the differences between the two groups in reading achievement appears to increase at each grade level" (p. 80). The same trend has been reported in virtually every study of reading performance in the SEL I population (Deutsch, 1966; Hirst et al., 1969; McCloskey, 1967). Gordon and Wilkerson (1966) report that the trend persists - and the performance gap continues to widen - even when serious remedial measures are undertaken by the system.

Reading Readiness Performance. Socio-economic status has been reported as a significant predictor of performance on standardized reading readiness testing (Deutsch, 1966; Weiner and Feldmann, 1963; Mortensen, 1968). Both Spache (Spache et al., 1967) and Harris (1969) report scores for the SEL I child on visual and auditory perception tasks in the 20th percentile bracket. Mortenson (1968) in a study of 1500 children in Atlanta reported that socio-economic level remains a significant predictor of performance on pre-reading discrimination tasks even when IQ is used as a covariate.

Language Differences. Differences in language performance associated with socio-economic level and ethnic group have been demonstrated consistently. Black SEL I children use shorter and less sophisticated sentences

(Black, 1966; Havighurst, 1966). They use a different grammar (Baratz, Schuy, 1969). They have more difficulty handling verbal instructions (Ozer, 1968). Their scores on phonological tests are significantly lower (Cazden, 1968), and according to Bernstein (1967), they use "public" or "restricted" language as against "formal" language or an "elaborated code." SEL I black children have difficulty understanding and producing function words and gerunds (John and Goldstein, 1967). They seldom pause while making an utterance, thus limiting the opportunity for gaining feedback and making appropriate modifications (Bernstein, 1967; Cazden, 1968).

Cognition. Differences in cognitive functioning between the SEL I and the non-SEL I child have been demonstrated by many investigators (Gordon and Wilkerson, 1966; Deutsch, 1964; Cazden, 1968; Reissman, 1962; Ausubel, 1967; Bruner, 1966). SEL I children are as proficient as their non-SEL I peers at tasks involving concrete manipulations and associative learning. They are less efficient than their non-SEL I peers at tasks involving pictures, symbolic representations, labeling, classifying, and problem-solving. They do not use language in a mediational role, and have difficulty transferring knowledge through the utilization of previously learned concepts.

## 2. Environment

The list of environmental variables which might affect reading performance of the SEL I child increases with each series of investigations. Interest has been focused on the effects of living conditions, the effects of child-rearing practices, and the effects of social norms and value systems.

Living Conditions. The SEL I home is usually described as crowded, noisy, non-verbal and confused. It is an impoverished environment, providing

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little opportunity for the development of perceptual skills. The home lacks organization, both spatially and temporally (Ausubel, 1967). Exposure to reading material - books, newspapers, and magazines - is minimal, with 50 per cent of the homes lacking even a pencil and paper (Deutsch, 1966). Unfortunately, the child has few opportunities to get beyond his home so that an impoverished home becomes an impoverished world. According to Silberman (1964, p. 73), "the lower class child suffers from an over-all poverty of environment that inhibits and prevents learning, not just in the first grade but later on as well."

The child of poverty, according to some authorities, suffers as much from the excesses of his environment as from its deprivations. From infancy on, the child preserves his homeostatic balance by tuning out excess noise. To satisfy his basic need for sleep the infant creates his own darkness and his own quiet. As he grows older he must protect himself from drunken screaming, physical battles, sexual displays and so develops the ability to "tune out" noxious stimuli. Unfortunately, the coping behaviors he learns at home doom him to failure in the school environment where selective attention to auditory and visual stimuli are the prerequisites of success.

Child-rearing Practices. Some authorities, while accepting the developmental handicaps imposed by the poverty environment, have looked toward child-rearing practices in the SEL I home for explanations of learning problems. Marans and Lourie (1967, p. 22), advancing the hypothesis that an infant's growth and development are influenced by the child-rearing methods to which he is exposed, have examined several child-rearing practices within the SEL I home. According to these investigators, there exists in this environment a magical thinking behavior which limits the ability of the adult to deal with reality. Closing her mind to the possibility of consequences,



the SEL I mother often neglects prenatal and well-baby care, and the child pays the price. At the same time, she tends to strive for direct gratification of her own dependency needs, and is thus unable to meet the needs of her children. Her attention to her child is often sporadic, satisfying her own needs rather than her child's. She may not recognize the individuality of her children. The child who has not been singled out for special attention and recognition has little opportunity to build up his own self-concept or develop a positive self-image. Mary W. Lamy (1962), in a study of reading achievement in primary grades, reports that a child's perception of himself is as good a predictor of reading as a standardized intelligence test.

Another child-rearing practice in the black SEL I home that bears directly on academic achievement is the maintenance in such homes of an authoritarian climate which allows little opportunity for verbal interaction between child and parent. According to Marans and Lourie (1967), the SEL I child lives in a home where the child must obey without questioning, where language is used to issue commands rather than to express ideas, and where silence and passivity in the presence of adults is the most effective coping mechanism.

John and Goldstein (1967), point out the effects of this poverty of verbal interaction on the language and thought patterns of the SEL I child. A child who has limited opportunities for feedback depends on the co-occurrence of label and referent for the development of vocabulary. This slows down the rate of language acquisition for the black SEL I child, particularly in the learning of verbs and gerunds where the child must "fit the label to varying forms of action observed and experienced" (John and Goldstein, 1967, p. 46). Because the development of verbal mediation almost certainly parallels the development of verbal skills (Vygotsky, 1962), the child who is delayed

in language acquisition will have difficulty with conceptual tasks in a learning situation.

Norms and Standards. Closely associated with the child-rearing practices of the SEL I family are its social norms and standards. Differences in cultural norms affect the motivational patterns of the child in a school situation. According to Katz (1967), there is a marked discrepancy between SEL parents' educational aspirations for their child and the amount of time they are willing to devote to his education. Katz asserts that this discrepancy between achievement value and achievement effort is reflected in the motivational pattern of the child. He suggests that "when high standards are adopted without the behavioral mechanisms necessary for attainment, the relationship between verbal expression of the standards and intellectual performance will tend to be an inverse one" (p. 175). A second problem for the SEL I child is a lack of opportunity to indulge in imaginative play. In the SEL I value system, a lie is dangerous because it leads to trouble with the authorities. Unfortunately, as Entwisle and Greenberger (1968) show, no distinction is made between fantasy and lying.

Frost and Hawkes (1966), point up another difference in value systems between the SEL I and non-SEL I child, whereby academic performance is affected. They find that the SEL I child is likely to be anti-authoritarian and very much in tune with the value system of his peers. Within his peer society the child who succeeds in school is looked upon as a "square," while the child who fails gains status. Success in school carries with it the danger of alienation and can become, therefore, a negative value for the SEL I child.

### 3. Genetic Characteristics of the SEL I Child

The writings of Arthur Jensen (1969) and the studies of Stodolsky and Lesser et al. (1969), have not only revitalized the heredity vs. environment debate, but also have raised the question of whether there are interrelated interclass differences in terms of the patterns of intellectual abilities. Based on their study of six- and seven-year-old children, Stodolsky and Lesser suggest that although differences in levels of ability are related to social class membership, differences in ability patterns are related to ethnicity. In a comparison of the verbal ability of low socio-economic Jewish, Negro, Chinese, and Puerto Rican children, Jewish children were ranked first, Negroes second, and Puerto Rican third. In a comparison of space conceptualization among the same children, Chinese children were ranked first, Jewish children second, and Negroes fourth.

Like Stodolsky, Arthur Jensen explores the possibility of stable differences in ability patterns. On the basis of research with "culture-fair" and culture-biased tests, Jensen (1969) hypothesizes two types of intellectual abilities: Level I or associative ability, and Level II or conceptual ability. "Level I involves "the neural registration and consolidation of stimulus inputs and the formulations of associations, while Level II ability involves self-initiated elaboration and transformation of the stimulus input before it eventuates as an overt response" (p. 111). Jensen concludes that Level I ability is normally distributed, while Level II ability is related to race and socio-economic status. Because conceptual learning is stressed in the school environment, the black SEL I child is beset with problems as he attempts to advance through the system.

Several authorities have taken issue with Jensen's basis hypothesis of the genetic basis of learning style. Cronbach (1969) suggests that

Jensen's dichotomy between Level I and Level II is an oversimplification, and that there may be several dimensions of individual differences. Elkind (1969), also rejecting Jensen's dichotomy, argues that intelligence is developed through experience and is characterized by the abilities of association and accommodation. Kagan (1969) takes issue with Jensen's findings that low intelligence ability patterns are genetically based. According to Kagan, the perceived intellectual inferiority of the SEL I child is better explained by differences in child-rearing than by differences in genetic endowment.



## CHAPTER 2

### REVIEW OF THE LITERATURE

The poor performance of the SEL I child on perceptual tasks (Sparke, 1967; Harris, 1969) and the importance of perceptual skills in early reading performance (Rudich, 1967; Ashlock, 1967) is well documented. There is, however, a lack of agreement as to the type of reading readiness experience that will have the highest probability of enabling the SEL I child to acquire the skills that are important for early reading performance.

Perceptual development must be thought of first in the context of the child's total experience in the kindergarten program. The nature of this experience will be determined in large part by the theoretical orientation of the program planners. Head-start programs, in the Gesell developmental tradition (exemplified by the Bank Street School, Minuchin & Biber, 1968), deemphasize formal perceptual training claiming that the role of the kindergarten is to provide a healthy social and emotional climate where natural development can take place. S-R oriented preschools, adapting the Bereiter-Englemann (1966) approach, stress formal perceptual skill training with immediate feed-back and reinforcement. Programs reflecting a Piagetian learning philosophy, as exemplified by the Perry Pre-school Project (Weikart, 1967), strive to create a learning environment in which the child is an active learner and where perceptual development is the result of an interaction between the child and his learning environment.

Even when educators agree as to the best method of promoting perceptual skill development, they may disagree as to the kind of perceptual skills that should be stressed in a reading readiness period.



Many educational theorists concerned with reading readiness stress the importance of developing a cluster of general readiness perceptual skills (Resnick, 1968; Frostig, 1966). According to this school of thought, general readiness non-alphabet skills must be mastered before the child can be successful with the higher-order alphabet skills directly involved in decoding.

#### 1. Non-alphabet Perceptual Sub-skills Related to Reading Performance

Several different non-verbal perceptual skills have been described in the literature. Investigators use correlation studies, longitudinal predictive studies, field studies, and/or experimental studies to define the relative contribution of these non-alphabet skills to reading performance.

Visual-Motor Skills. The relationship of visual-motor skills to reading performance has not been clearly defined. Delacato (1963), Getman and Hendrickson (1966), and Harris (1968) report significant correlations between visual-motor skills and reading performance. Grattan and Matin (1965), Kershner (1969), and Taylor and Nolde (1969) report no significant difference between measures of visual-motor proficiency and measures of reading performance. Jeralyn Plack (1968) reports highly significant relationships between reading and throw-and-catch and zigzag-run tests, but no relationship between reading, kicking, jumping, and reach tests.

Visual Skills. Marianne Frostig (Frostig and Horne, 1964) identifies six visual perception skills associated with reading performance: position in space, spatial relationship, figure ground perception, perceptual constancy, directionality, and hand-eye coordination. To measure these variables, moreover, Frostig developed a visual perception test. Correlation studies based on Frostig's test yield conflicting results. Quentin R. Bryan (1964) reports a study with first, second and third grade children in which visual perception, as measured by the Frostig test, is a better predictor of first grade reading success than intelligence or reading

readiness scores. In studies by both Jacobs (1968) and Weingart (1968), perceptual scores based on the Frostig test are not correlated with first grade reading performance. Frostig developed a reading readiness program designed to develop the six visual perception skills to which she assigns priority (see above).

Jean Goins (1958) administered sixteen different visual perception measures to 120 first grade students. Using factor analysis, she identified two factors which clarify the intercorrelation patterns of the sixteen measures. The first factor is labeled flexibility of closure, and described as facilitating the making of a closure in an unorganized field. The second factor is labeled by Goins as strength of closure, and described as facilitating the retention of a figure in a discriminating field. Reading achievement, according to Goins, loads on factor 2 but not on factor 1. Of all the variables measured, pattern copying loads out heaviest on factor 2 and correlates .519 with first grade reading achievement. Goins concluded that factor 2, measuring some sort of strength of closure, represents the ability to retain the pattern of a written word, which is an important skill at the first grade level.

Auditory Skills. C. Ann Brickner (1967), defining auditory discrimination as the degree to which an individual is capable of categorizing sound stimuli meaningfully and responding to them, developed two taped sequences of auditory materials, one of non-verbal sound stimuli and the other of narrative material. Her results showed consistent significant differences in listening ability favoring children trained with the narrative material.

Seriation. Inhelder and Piaget (1964) define seriation as the ordering of objects by size and orientation, and suggest a highly interactive

relationship between seriation and classification or language functioning. In line with Piaget's conceptualization, Scott (1968) suggests that "deficiencies in perceptual skills may be key elements in the irreversible language deficiencies of many disadvantaged children" (p. 36), and that "the child must attain the basic skills in processing auditory and visual information before he makes the critical shift to a predominantly visual approach with the advent of formal reading" (p. 37). Using an experimental seriation test with 365 kindergarten subjects, Scott reported a significant (.58) Pearson product correlation between the California Seriation and Reading Achievement Test Scores. Hershoren (1969) and Hurley (1968) corroborate Scott's findings. Using the visual-motor sequencing sub-test (VMS) of the Illinois Test of Psycholinguistic Abilities, Hershoren reports a correlation of .61 between VMS and second grade reading comprehension. Using the same sequencing measure, Hurley reports that VMS scores discriminated between adequate and inadequate readers with a population of second grade readers taught by a phonics approach. On the other hand, Sterritt et al. (1968) report no significance between reading success and visual-motor sequencing in a population of second grade readers.

Auditory-Visual Integration. The role of auditory-visual integration in the decoding process has received considerable attention in several studies. In a study by Raab, Deutsch, and Freedman (1960), more difficulty in shifting modalities was reported for poor readers than for good readers. Birch and Delmont (1964), correlating auditory-visual integration task scores of kindergarten children with first and second grade reading performance, report an  $r$  of .70 with grade one reading and an  $r$  of .42 with second grade reading. Hurd (1967), on the other hand, discounts the importance of auditory-visual shifting. Using a specifically designed



perceptual apparatus to measure reaction time, Hurd reports  $r$ 's of .969 and .970 between the ability to shift from auditory to visual, and the ability to respond to stimuli in the same channel. On the basis of these high coefficients, Hurd concluded that shifting behavior is not independent of the ability to respond to stimuli in a single channel. Furthermore, coefficients computed between auditory-visual shifting and reading achievement were not significant at the .05 level. On the basis of these findings, Hurd concludes that only "random" relationships exist between sense modality shifting and reading achievement. Sterritt et al. (1968), in a study of six sub-processes involved in decoding, test the hypothesis that more errors would be made by a group of kindergarten children on perceptual sub-tests involving modality transfer than on perceptual sub-tests that do not involve a transfer. In line with the findings of Hurd, this hypothesis was not supported.

## 2. Alphabet Perceptual Sub-skills Related to Reading Performance

Despite the body of research that relates general readiness perceptual skills to reading performance, many investigators challenge the assumption that competency in underlying perceptual skills is a pre-requisite for successful decoding. They question the automatic transfer of acquired general perceptual skills to the decoding process. Harris (1969), in discussing the effect of perceptual training on performance, asserts that "transfer of what is learned during perceptual training to the art of reading is not automatic, and sometimes does not take place." Muehl (1960) compares the performance on word list learning of children trained with a word list matching task with children trained with a geometric forms matching task. The children trained with the word list performed significantly better. In

an effort to minimize the problem of transfer, many investigators, in seeking out reliable predictors of reading success, have focused on perceptual variables directly associated with decoding behaviors.

Several auditory and visual alphabet sub-skills that related to reading performance have been identified in the literature.

Specific Visual Skills. Letter naming is recognized throughout the literature as the best single predictor of first grade reading achievement. Jeanne Chall (1967) analyzes seven predictive studies that relate knowledge of letters or letter-sound relationships to reading achievement. These seven studies report correlation coefficients from .3 to .9 between letter naming and early reading. The strength of letter naming as a predictor of reading success has been substantiated in a series postdating Chall, most notably in the Dykstra (1968) study, in which findings from twenty-seven separate reading studies were coordinated and summarized. Silberberg (1968) and Panther (1967) have also produced studies in which alphabet knowledge emerges as the single best predictor of early reading performance.

Visual Discrimination of Letters and Words. Several investigators have explored the strategies used by children to identify words or letters. In an attempt to clarify the sub-skill component crucial to alphabet knowledge, Gibson, Gibson, Pick, and Osser (1962) conducted an experimental study of letterlike forms by which they investigated the dimensions of difference that are critical for the differentiation of letters for children four through eight years old. Twelve letterlike forms were constructed as standards, and transformations were developed for each standard, including three degrees of change from line to curve or vice versa, five changes in orientation, two perspective transformations, and two topological transformations. Errors were classified according to type of transformation

mistakenly identified with the standard. The investigators found a difference in performance between children four through eight years old not only in terms of the amount of error but also in terms of the type of error. An analysis of the differences in type of error committed confirmed the hypothesis that the child has to learn the critical features of letters, so that "because of transfer from his already good ability to differentiate critical features of objects, he does not start out 'cold'" (Gibson, Gibson, Pick, and Osser, 1962, p. 905). These authors suggest that children learn the distinctive features of letters by simply "looking repeatedly at many samples of letters containing varying and invariant features." In an investigation of the bases of word recognition, Marchbanks and Levin (1965) found that with first grade children, the first letter of a word is the most salient cue used in decoding. They related this dependency on letter cue to preliminary alphabet training.

C. A. Shea (1968) investigated word discrimination in early reading. In a test of predictive validity of a word discrimination test, Shea reports that a combination of a Lorge-Thorndike test and a visual discrimination word test was a better predictor of readiness to read than the combination of Lorge-Thorndike and the Metropolitan Readiness battery, with a correlation coefficient of .65 between achievement on the visual discrimination test and achievement on the word recognition test.

Specific Auditory Skills. Walter MacGinitie (1967) stresses the importance of auditory perception of letter sounds in beginning reading acquisition, whether the child is taught reading by a linguistic or a look-say approach. Several different auditory skills related to decoding have been pointed out in the literature. Mortenson (1968), measuring the ability of a group of kindergarten children to discriminate beginning, middle, and



final sounds, reports a significant difference in all three measures across socio-economic level. Dykstra (1966), administering seven auditory discrimination sub-tests from a series of published reading readiness tests, reported correlation coefficients between the auditory discrimination measures and the reading tests ranging from .19 to .43. By combining all seven tests, Dykstra was able to account for 32 to 38 per cent of the variance in reading achievement.

Auditory Blending and Segmenting. Jeanne Chall (1963) investigated the importance of auditory blending as a factor in reading success where blending is described as the ability to reproduce a word by synthesizing its component sounds. Durrell and Murphy (1963) demonstrated the importance of a reverse ability -- the ability to segment words into sounds that correspond in sequence to letters or letter groups.

### 3. Relative Importance of Visual and Auditory Modalities

Educators who take the position that a reading readiness program for the SEL I child should have as an objective the development of these perceptual alphabet skills, disagree as to the relative importance of visual versus auditory training for the development of these decoding behaviors. Some educators attribute reading difficulties to a lack of training in auditory skills and insist that top priority should be given to the training of auditory skills in the readiness stage (Chall, 1967; MacGinitie, 1967; Durrell, 1969). Other educators take the position that reading is a visual act and assign top priority to visual skill training (Scott, 1968; Frostig & Horne, 1964; Goins, 1958; Wheelock & Silvaroli, 1967; Bryan, 1964). Still another group insists that decoding involves an auditory-visual transformation, and that auditory and visual training should receive equal stress in the readiness stage (Balmuth, 1968; Cornell, 1968; Mortenson, 1968).

Balmuth, reviewing eight studies in which the use of one modality is compared with the simultaneous use of more than one modality, reports the combination as superior in each instance.

#### 4. Programs Used in This Study

In the present study, the investigator develops four perceptual training programs with each program reflecting a different point of view as to the kind of sub-skill training that will be most beneficial for the black SEL I kindergarten child.

##### GENERAL READINESS PROGRAM (GRP)

The rationale of the GRP program is that general readiness skills are the prerequisites for higher order alphabet skills, and should be taught first. This is particularly important with a population that is known to perform poorly on tests that measure perceptual sub-skills.

##### VISUAL ALPHABET PERCEPTUAL PROGRAM (VAP)

The rationale of the VAP program is that reading is primarily a visual act. Pre-reading programs, therefore, should assign major priorities to visual modality experiences. These experiences will be most valuable when they involve exposure to the same symbols that the child will use in decoding.

##### AUDITORY ALPHABET PROGRAM (AAP)

The rationale of the AAP program is that auditory skills are vital for successful decoding but are not acquired automatically. This is particularly true with the child whose ear is attuned to a different dialect or who has not been accustomed to attending to auditory input. Stress on auditory alphabet skill development will enable the child to discriminate and identify phonemes and will increase his probability of achieving success with early reading.



### AUDITORY-VISUAL ALPHABET PERCEPTION PROGRAM (AVAP)

The rationale of the AVAP program is that decoding involves an auditory-visual transformation and that both auditory and visual skills are essential for successful performance. Perception is a learned behavior involving the interpretation of sensory input. When the sensory input of a pre-reading program includes letter forms and letter sounds the child learns to attend to and interpret the same kind of stimuli to which he will be exposed in a reading program.

### TOTAL PROGRAM

In the present study these four perceptual programs are tested within the context of a total kindergarten program. The overall program endorses the Piagetian learning model, which conceives of learning as the end result of interaction between the child and his environment. By keeping constant the overall educational experience to which the child is exposed, differences attributable to a perceptual treatment program can be identified.

## CHAPTER 3

### PROBLEMS AND HYPOTHESES

#### PROBLEM I:

The opinions of educators are divided as to the importance of instituting a non-alphabet general readiness perceptual program in a SEL I kindergarten class. Educators favoring a preparatory program in general readiness skills, assume that lower-order non-alphabet perceptual skills are the prerequisites for higher-order alphabet perceptual skills. Educators who stress alphabet skill training in the kindergarten class assert that these alphabet skills can be trained even when the child has not demonstrated proficiency with non-alphabet perceptual sub-skills.

Hypothesis I. There will be no significant difference in performance between AVAP and GRP on post-treatment measures of auditory and visual perception.

Rationale of Hypothesis 1. In both the AVAP and the GRP programs there is equal emphasis on auditory and visual discrimination tasks, with the discrimination tasks in the general readiness program involving geometric shapes and non-verbal sounds, and the discrimination tasks in the AVAP program involving letter shapes and letter sounds. We would expect the GRP group to out-perform the AVAP group if perceptual skill development followed a hierarchical model in which successful performance of general readiness tasks was the prerequisite for successful performance of discrimination tasks with letter sounds and shapes. The investigator assumes the position that the child who is placed on a program stressing alphabet

perceptual skills will perform just as successfully on measures of auditory and visual perception as a child who is placed on a general readiness perceptual training program. Measures of auditory and visual perception will be used to test this hypothesis.

#### PROBLEM 2:

Mean gains in IQ scores are commonly used as criteria for determining the effectiveness of kindergarten curricula. There is no general consensus in the literature as to the type of curriculum that produces the most significant gains in IQ.

Hypothesis 2. AVAP will perform significantly better than GRP, VAP, and AAP taken as a pooled group - on a post-treatment IQ measure.

Rationale of Hypothesis 2. Support of Hypothesis 2 would suggest that a task-oriented skill building program where the input is both visual and auditory is more effective in improving general performance for the SEL I child than a general readiness program emphasizing underlying perceptual skills, or a task-oriented skill building program in which only one modality is stressed.

#### PROBLEM 3:

Educators working with the kindergarten child have been interested in the possibility of placing him on a particular pre-reading program on the basis of his pre-test performance.

Hypothesis 3. There will be no interaction effect between either auditory perception level, and treatment group membership; visual perception level and group; or IQ level and group, where auditory perception, visual perception, and IQ level are determined on the basis of pre-test scores.

Rationale of Hypothesis 3. Although support of this hypothesis does not preclude the possibility of developing a treatment prescription on the

basis of pre-test profile, it does assert that this prescription cannot be developed on the basis of information provided by an IQ test, an auditory perception test, or a visual perception test.

PROBLEM 4:

The relative effectiveness of different types and levels of modality training in developing reading readiness skills is still an open question. One area of controversy involves the trainability of perceptual skills. Some investigators take the position that perceptual skills are maturational in nature and cannot be trained through a skill building program. Others attest to the trainability of perceptual skills. A second area of controversy concerns the relative effectiveness of visual and auditory training.

Hypothesis 4. "AVAP-VAP" will perform significantly better than "GRP-AAP," and AVAP will perform significantly better than AAP on measures of visual perception and on learning rate tests which use a "look-say" instructional method.

Hypothesis 5. "AVAP-AAP" will perform significantly better than "VAP-GRP," and AVAP will perform significantly better than VAP, on measures of auditory perception.

Rationale of Hypotheses 4 and 5. Training in letter naming and word discrimination is a part of the AVAP and VAP programs, but is not included in the AAP program. Support of Hypotheses 4 and 5 would suggest that both auditory and visual perception training are important for developing readiness skills. At the same time it would demonstrate the plausibility of training perceptual skills specific to decoding.

Questions for Investigation: (1) Do children who have difficulty making a shift from the visual to the auditory mode also have difficulty learning to read a list of words? Some children will perform less well on



a test requiring an auditory-visual shift than on a parallel test where the input is strictly visual. Do children who demonstrate this performance discrepancy perform less well on a word learning rate test than children who do not demonstrate this performance discrepancy? The answer to this question may provide information concerning the auditory-visual shifting behavior involved in beginning reading. A measure of auditory-visual shifting, and a measure of word-list learning will be used to investigate the question.

(2) Does a child's activity level as assessed by a rating scale filled out by the teacher correlate significantly with post-treatment IQ or reading readiness scores? The answer to this question will provide an indication of the effect of submissive behavior on learning. As the OEO sample used in the present study was observed to be more submissive than OEO groups of previous years, a high relationship between activity ratings and learning behaviors would have important implications for this study. Two pupil rating scales, a measure of primary Mental Ability, several measures of reading readiness; letter names, phoneme identification, auditory and visual perception, and learning rate -- will be used to investigate this question.

(3) Is the relative importance of auditory and visual perceptual training determined to any degree by the methodology used in teaching reading? The Murphy-Durrell reading readiness battery includes a sub-test which is called Learning Rate. This sub-test measures the child's ability to learn to read a list of irregularly spelled familiar words that are presented according to a standard basal approach and grouped according to meaning. The investigator constructed a similar learning rate test (LLR) but grouped the words used in the presentation according to spelling pattern similarities rather than meaning. Does the child who has been exposed to alphabet forms do better on the Murphy-Durell learning test where success may depend

on his ability to recall a configuration of symbols? Does the child who has been trained in an auditory alphabet program do better on the LLR where success may depend on the child's ability to discriminate likes and differences in beginning sounds?

## CHAPTER 4

### PROCEDURES USED IN THIS STUDY

#### A. Design

The design for the present study assigned 60 SEL I children to four treatment groups by a double stratified random sampling procedure on the basis of Sex and IQ. Four teachers and eight aides were involved in the total program, with three of the four teachers and all eight aides working with the treatment material. For the morning sessions, the children were assigned to three classes conducted by aides, with five children from each of the four treatment groups (a total of twenty children) randomly assigned to each class. During the afternoon sessions, the four treatment groups were kept distinct. Each group rotated through four classrooms in the course of the afternoon, with equal amounts of time allotted to each class period. One teacher conducted a language concepts class, a second teacher taught reading readiness, a third creativity, and a fourth mathematics. (Because all groups were taught math with the same program, the mathematics class, although part of the afternoon rotation, was not a part of the experiment.) Each teacher in the experiment, therefore, taught four different groups, using a different method with each group. Each child spent 25 minutes a day in each experimental class during the course of treatment. Class schedules were rotated every twelve days so that children who spent the first period with Teacher 1 in the first week, spent the first period with Teacher 2 in the following week, and so forth. This rotation guarded against a particular group's having prime time with a particular teacher. (See Table 1 below.)

TABLE 1

Morning

Aide 1	Aide 2	Aide 3
<u>Class Composition</u>	<u>Class Composition</u>	<u>Class Composition</u>
5 AAP children	5 AAP children	5 AAP children
5 VAP children	5 VAP children	5 VAP children
5 GRP children	5 GRP children	5 GRP children
5 AVAP children	5 AVAP children	5 AVAP children

Afternoon

	<u>Teacher 1</u>	<u>Teacher 2</u>	<u>Teacher 3</u>	<u>Teacher 4</u> °
Period 1	GRP	VAP	AAP	AVAP
Period 2	VAP	AAP	AVAP	GRP
Period 3	AAP	AVAP	GRP	VAP
Period 4	AVAP	GRP	VAP	AAP



## B. Development of Curriculum

The development of curriculum for the present study was a major undertaking. The study called for an over-all curriculum that would be appropriate for the SEL I child and would remain constant across treatment groups except for the perceptual training component. This perceptual training component had to be designed according to the specifications of each type of treatment, and then introduced into the general curriculum as an addition or modification. There were three classrooms in the experiment: reading readiness, creativity, and language concepts. Although the most concentrated perceptual training took place in the reading readiness classroom, perceptual training was also introduced into the language concepts and creativity classrooms. The investigator developed specific programs for each of the classrooms in the experiment, with four separate "editions" of these programs according to the specifications of the four experimental treatments. No special program was developed for mathematics, as the mathematics teacher used the same Addison-Wesley Kindergarten Mathematics curriculum for all four treatment groups.

The first step in the building of curriculum was the development of objectives for the three experimental classrooms. These objectives were expressed in general terms for the creativity classroom and in behavioral terms for the language concepts classroom and the reading readiness classroom. The listing of objectives served four purposes. First it provided a set of guidelines for the teacher. Second, it provided a means of keeping the four treatments parallel. Third, it provided a basis for ongoing progress records. Fourth, it gave the instruction a programmed format and thus opened up the possibility for replication.

The second step in the construction of the treatment program was the development of a list of suggested activities to accompany the behavioral objectives. Based on the assumption that learning takes place as the result of an interaction between the child and his environment, the suggested activities were designed to provide experiences that would maximize the opportunity for the SEL child to learn through encounter rather than drill. These activities included the following features:

- a. Several activities were suggested for each behavioral objective, providing alternatives that would take into account individual preferences, and enabling a child to learn through successive encounters with his environment.
- b. Suggested activities emphasized small group and individual activities, thus providing the child with opportunities for interaction with his peers as well as interaction with an adult on a one-to-one basis.
- c. Concrete manipulative materials were used extensively.
- d. Wherever possible, instructional materials included a self-corrective element so that the child could receive immediate feedback and reinforcement.
- e. The activities provided the basis for individualized instruction in which an appropriate starting point and pace could be selected for each child.

#### 1. Reading Readiness

The GRP reading readiness program was designed to develop an array of underlying auditory and visual skills related to decoding behavior. Three major sources were tapped: (a) descriptive statistics revealing perceptual deficits of the SEL I child; (b) published studies relating performance in different perceptual tasks to decoding; and (c) published programs or listings

of underlying perceptual skills related to decoding behavior, including the Frostig Perceptual Program (Frostig and Horne, 1964), the New York Curriculum (1968) Sequence of Objectives, the Hartford "Follow-Through" Program (1969), Lauren Resnick's Preschool Curriculum (Resnick, 1967), and the Llorens Training Program (Llorens et al., 1969).

The three reading readiness alphabet programs followed essentially the same format as the GRP reading readiness programs. The behavioral objectives listed for the VAP reading readiness program represent a modification of the general readiness visual perception listing, since with these objectives the emphasis was shifted from visual experience with shape, color and abstract symbol to visual experience with letters. Letters were used in tasks requiring discrimination, identification, perceptual constancy, sequencing, figure-ground perception, and spatial orientation. The behavioral objectives listed for the AAP reading readiness program also represent a modification of general readiness auditory perception objectives, since the emphasis here is on the matching, identifying, ordering, and discriminating of letter sounds. The AVAP behavioral objectives incorporate the objectives of both VAP and AAP, and include a series of tasks that require modality shifting. In developing behavioral objectives and suggested activities for alphabet reading readiness programs, the following sources were tapped: the New York Curriculum (1968), the Lyons and Carnahan (1966) Reading Readiness Objectives Program, Chall (1967), and Bereiter and Engleman (1967).

## 2. Language Concepts

Behavioral objectives for the language concepts teacher are an outgrowth of the literature review describing the unique cognitive style and language characteristics of the SEL I child. The language concepts program



stressed listening, language production, verbal interaction, categorization, and generalization. Emphasis was placed on communication rather than production of standard English syntax. In line with the finding that the SEL I child acquires language through the co-occurrence of label and referent, routines in which the child describes an ongoing action were given particular emphasis. Pattern drills were introduced with the hope of training the SEL I child to use language in a mediational role, allowing him to use internal language as a cognitive tool (Bereiter, Engelmann, Osbor, and Reidford, 1966). Games and routines were introduced to each construction with a low frequency in SEL I black language repertoire. Accordingly, "not" constructions, pronouns, passive constructions, function words, and tense constructions were given special emphasis. General instructions to the teacher in a manual accompanying the objective listings pointed up the importance to the child of self-expression through language and discouraged the teacher from "correcting" non-standard usage. Major sources for the language concepts objectives and activities were: Bereiter and Engelmann, Osborn, and Reidford (1966), Gotkin (1968), Baratz (1969), and O'Donnell (1968). AAP, VAP, and AVAP versions of the general readiness language program included the same behavioral objectives as the GRP language program. In the suggested activities, however, modifications in line with the treatment prescription were introduced whenever appropriate. An example follows:

<u>Behavioral Objective:</u>	<u>Uses "not" construction</u> appropriately in a sentence.
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Suggested Activity for GRP  
Equipment:

A series of containers with objects belonging to two different classes in each container. One container has shells and rocks; a second container has leaves and flowers; a third container has squares of paper and squares of fabric.



Procedure: Each child selects one object from one container and describes it using this format:

"This is a shell. It is not a rock."

#### Suggested Activity for VAP

Equipment: A series of containers, each holding two letters.

Procedure: The child selects a letter and says, "This is a b. This is not a d."

#### Suggested Activity for AAP

Equipment: A series of containers, each holding two pairs of rhyming objects, or two pairs of objects with like beginning sounds. Examples are: shell - bell, car - star, for rhyming objects; bell - boat, cat - car, for objects with like beginning sounds.

Procedure: The child selects an object from one of the containers. "This is a cat. It begins like car. It does not begin like dog."

#### Suggested Activity for AVAP

Equipment: A series of containers each holding two objects and two letters; the letters correspond to the beginning sounds of the objects. For example, with the letters b and w, the objects might be a ball and a wagon.

Procedure: The child selects an object. "This is a ball. It begins with a b. It does not begin with a w."

### 3. Creativity

For the creativity program, objectives were stated in general rather than behavioral terms. The teacher was given, instead of a list of suggested activities, a book of daily lesson plans with activities described for each of the four treatment groups. These activities included for each day an art or craft activity and a music, dance, or dramatic activity, with appropriate

modifications for the different treatment groups. An example of a craft activity follows.

MATERIAL: CLAY

Suggested Activity for GRP	Make a variety of shapes with clay.
Suggested Activity for AAP	Make objects with the same beginning sound as "boy": for example, ball, beads, boats, bananas serve as models.
Suggested Activity for VAP	Make a lower case <u>b</u> and an object that begins with the <u>b</u> sound.

C. Description of Sample

The sample for the study consisted of 30 males and 30 females, ranging at the beginning of the study from four years six months to six years of age, with 90 per cent of the children between five and six years old. Fifty-three of the children were black and 7 white. These children were recruited by the staff of the Office of Economic Opportunity in Broward County, Florida. All of the children in the study came from economically deprived areas in the environs of Hollywood, Florida. Family incomes ranged from \$3,000 to \$4,000 per family per year. The majority of the children lived either in project single dwelling or project apartments located in Hollywood, West Hollywood, and Dania; 6 of the children came from the migrant worker colony in Davie. Statistics on employment, marital status, and parent education were difficult to acquire as the parents were sensitive about being questioned. (Parents of registrants responded verbally to a questionnaire on the family, but were not required to answer any questions if they raised objections.) Thirty-five families responded to a question on marital status. Of these, 25 reported parents living together, 8 reported parental separation with child living with mother, and 2 listed themselves as "guardians."

Applicants who did not respond to the question on marital status may have been protective of their aid-to-dependent children status, or perhaps were involved in family situations where parentage was not clearly delineated. Nine families responded to the question on educational status of both parents, and 9 more reported the highest grade attended by one parent. Among these respondees, 3 parents had attended two years of college, 11 parents were graduated from high school, and 4 parents had gone through the eleventh grade. The remaining respondees on education reported between 4 and 10 years of school attendance. It was the impression of the OEO social worker that applicants who failed to respond to the question on education were likely not to have finished elementary school. Occupations were reported for 25 fathers and 17 mothers. Eleven fathers worked in construction, 7 in service, 4 in farming or gardening, and 2 in auto repairs. Fifteen mothers were domestics, one was a beautician, and one was a nurse's aide. It was the impression of the social worker that many fathers who did not list their occupations worked as day laborers, fruit pickers, or field workers. Place of birth and number of siblings were listed on all applications. All but three of the children were born in Florida and all but 7 were born in Broward County. The mean number of children per family was three (see Appendix B).

All children in the school were given a physical examination during the course of treatment and reports were made available to the investigator. The most common health problem was anemia with hemoglobin below a gram percentage of 37 reported for all OEO children in the school. (A gram percentage of less than 65 falls below the normal range.) Four cases of systolic murmur, three cases of coarse chest rales, three orthopedic problems, two ear problems, two cases of ketone bodies in the urine, one hydrocele, one



umbilical hernia, one protruding abdomen, one case of epilepsy, and several upper respiratory infections were reported by the physician. Children with special problems were wait-listed for referral to a specialist. Daily vitamin and iron pills were prescribed for all of the O.E.O. children.

#### D. The Setting

The study was conducted in the University School Center in Hollywood, Florida. The University School is a private, non-profit school with a close working relationship with the Social and Behavioral Science Center of Nova University. It was housed in the Sunday School wing of Temple Beth El. The University School, jointly with the Broward County Office of Economic Opportunity, sponsored a Day Care program for SEL I kindergarten children. The SEL I children in the center were all Head Start applicants who were not enrolled in the regular Broward County Head Start program because of either late applications or lack of space in the facility in their area. The children were bussed to school by the Office of Economic Opportunity, and were given hot lunches through the Broward County School System. The children remained in school for the entire day, with the morning program conducted under the auspices of the Office of Economic Opportunity Day Care staff, and the afternoon program conducted under the auspices of the University School staff.

The Staff. Two full-time staff members employed by the Office of Economic Opportunity and eight trainees sponsored by the Broward County Economic Opportunity Center were associated with the SEL I program. Two teachers from the University School worked half-time with the SEL I program. In addition, there were several volunteers, including a retired art teacher who helped with the morning program. Formal instruction took place in the afternoon, with one teacher and two Opportunity Center aides in each



classroom. Qualifications of staff members follow.

<u>Teacher</u>	<u>Area</u>	<u>Sex</u>	<u>Race</u>	<u>Training</u>
OEO Teacher	Mathematics	Male	Negro	College trained but not certified
University School Teacher	Reading Readiness	Female	White	Certified in Early Childhood Education
University School Teacher	Language	Female	White	Certified in Early Childhood Education
OEO Teacher	Creativity	Female	Negro	High School Diploma; Child-Care Certificate
Trainees (total 8)	Rotate	Female	7 Negro 1 White	High School Dropouts High School Dropout

#### E. Tests and Measures

##### 1. Test of General Ability

The Pintner-Cunningham Primary IQ Test was selected as the measure of IQ. This selection was made on the basis of experience with the SEL I child. After experimenting with several group IQ tests, including the Cattell Culture-Fair Test, the consensus of opinion of the University School staff was that the Pintner-Cunningham Primary Test was the most useful instrument for the SEL children at the school. This judgment was made on the basis of ease of administration, total testing time, clarity of directions, format, and layout, and appropriateness of content. In contrast to performance on several other measures of general ability, very few children zeroed out completely on this test.

The primary battery of Pintner-Cunningham is designed for K-2. According to Thorndale and Hagen (1966), both reliability and validity are satisfactory, and the manual is clear and complete. The manual reports a split-half reliability figure of .84.

## 2. Measures of Reading Readiness

Reading readiness measures used as predictors and/or criteria for the study include: (a) the Murphy-Durrell Reading Readiness Analysis sub-tests; Phonemes Part I, Letter Names, and Learning Rate; (b) the Gates-MacGinitie Reading Measures: Auditory Discrimination and Visual Discrimination sub-tests; (c) a linguistic learning rate test developed by the investigator using the same format as the Murphy-Durrell Learning Rate Test with modification of the word list and mode of presentation; and (d) an auditory-visual shifting test constructed by the investigator.

Murphy-Durrell Reading Readiness Measures. The Murphy-Durrell Reading Readiness Analysis was selected as one of the operational measures of reading readiness. It was the only standard Reading Readiness battery reported in Buross (1968) that included both a phoneme discrimination test and a learning rate measure. Three sub-tests from the Murphy-Durrell Analysis were used as both pre-tests and post-tests; (a) the phonemes test, providing an inventory of the child's ability to identify separate sounds in spoken words; (b) the letter names test, measuring the child's ability to identify named letters; and (c) the learning rate test, measuring the number of words a child can recognize one hour after a formal instructional presentation using a standard look-say approach. The odd-even split-half reliability coefficient for the Phonemes is .94, for Letter Names .94, and for Learning Rate .88. The total test reliability using odd-even split-half correlation coefficients is .98, the correlation with the Pintner-Cunningham Primary Test is .64 and the predictive validity coefficient with the Stanford Reading Achievement Test is .65.

Gates-MacGinitie Reading Readiness Measures. The Gates-MacGinitie Reading Readiness Test was selected as a second operational measure of

Reading Readiness. Selection of this test was made on the basis of its high reliability .97 (Cox, 1949), and its popularity in studies involving the SEL I child. It supplements the Murphy-Durrell Battery in that it includes sub-tests on auditory and visual perception that do not correspond to the sub-tests in the Murphy-Durrell Battery. The manual does not provide reliability or validity figures for the individual sub-tests.

The Auditory Discrimination Sub-test. The Auditory Discrimination sub-test measures the child's skill in distinguishing between two words that are similar in sound. It is composed of 21 pair of words that correspond to 21 pictures. The examiner names the pictures and the words. He then repeats one of the words and the child is asked to mark off the picture that goes with that word. The test is not culture-fair as some of the words (for example, judge, fruit, thirty, mend, mark, march, peak, peer) used in the test may not be in the vocabulary of the SEL I child. The Visual Discrimination sub-test measures the child's ability to distinguish between the printed form of words with varying degrees of similarity. The test includes 24 items; each item consisting of four words, three alike and one different. The child is asked to mark off the word that is different. Children who do not understand the meaning of "different" cannot perform on this test.

Linguistic Learning Rate Test. This test was constructed by the investigator for the purpose of the study. It follows the exact format of the Murphy-Durrell Learning Rate Test with the following changes: (a) vocabulary words from the Sullivan Linguistic Reading Series are substituted for the basal vocabulary words used in the Murphy-Durrell Learning Rate Test; and (b) criterion words are grouped according to similarity of sound rather than similarity of meaning. It measures the child's ability to receive and interpret an auditory cue and associate this cue with a visual stimulus.

The task in actuality is not too different from the task in the phoneme test except that the visual stimulus is a series of words rather than a series of pictures. The correlation between the LLR and MDLR was .65 (see Appendix C), while the correlation between the LLR and the phoneme test was .78.

The Linguistic Learning Rate Test was used as a post-test only, and was incorporated into the Murphy-Durrell Learning Rate Test, so that half of each of the tests was administered on each of the consecutive testing days. This procedure was not used for the pre-tests, where only the total Murphy-Durrell Learning Rate Test was administered on a single testing day. The investigator followed this procedure because the alternative of following the same procedure for pre-test and post-test might have produced uncontrolled practice effects in a test that calls for a thirty-minute teaching period. The second alternative of administering half of each test as a pre-test was also rejected in the interest of determining the children's standing on the pre-test, according to national norms.

Auditory-Visual Shifting Test. This test, constructed by the examiner for the purpose of the present study, attempts to identify those children who show a differential in performance between a task demanding a shifting of modalities and a parallel task not demanding any modality shift. The task selected is one-to-one correspondence, which is presented by rows of pictures and dots. The child is asked to mark off the same number of pictures as he sees dots. Next, the child is given a sheet of paper with some pictures, but this time taps are substituted for the dots. The child is asked to mark off the same number of pictures as he hears taps (see Appendix C).

Pupil Ratings. Two pupil rating forms were developed by the investigator to be used as pre-treatment measures of activity level and attending



behavior. These rating scales were not a part of the original plan for the study but were an outgrowth of a conference with the school principal. The principal expressed the opinion that this class of OEO children seemed quieter and more submissive than children who had been in the school in previous years. Because the sample for the study was small, it seemed important to have a pre-measure of any atypical behavior that could have an effect on treatment. The pupil rating scales were modifications of behavior rating scales that had been developed and used in the University School. The Attending Behavior Scale was developed as a measure of various attending behaviors including responsiveness, attention span, and ability to follow directions. These behaviors were rated as excellent, very good, good, fair or poor. The Activity Level scale was developed as a measure of the child's response level, and included amount of activity, speed of activity, amount of talking and amount of laughter. These behaviors are rated on a 5 point scale: 1= too little; 2 = somewhat too little; 3 = appropriate; 4 = somewhat too much; and 5 = too much (see Appendix D).

#### F. Research Hypotheses

For the purpose of the analysis all hypotheses are stated in the null form.

##### HYPOTHESIS I.

- (A) With homogeneity of regression established, and Gates Reading Readiness Auditory Perception Pre-test scores used as a covariate, there will be no significant difference in performance between AVAP and GRP using the Gates Readiness Auditory Perception Post-test as a criterion.
- (B) With homogeneity of regression established, and Gates Visual Perception Pre-test scores used as a covariate, there will be no significant difference in performance between AVAP and GRP using the Gates Visual Perception Post-test as the criterion.

## HYPOTHESIS II.

With homogeneity of regression established and Pintner-Cunningham Primary Ability Test as a covariate, there will be no significant difference in performing between AVAP and GRP, AAP and VAP taken as a pooled group, using Pintner-Cunningham Post-test scores as the criterion.

## HYPOTHESIS III.

There will be no interaction effect between auditory perception level and treatment group, visual perception level and treatment group, and IQ level and treatment group, where auditory, visual, and IQ level are determined on the basis of pre-test scores.

## HYPOTHESIS IV.

- (A) With homogeneity of regression established, and Murphy-Durrell Letter Name Learning rate and Gates Visual pre-test scores used as covariates, there will be no significant differences in performance on the Murphy-Durrell Letter Naming sub-test, the Gates Visual Perception sub-test, and the Murphy-Durrell Learning Rate Test between AVAP and VAP pooled, and GRP and AAP pooled.
- (B) With homogeneity of regression established, and Murphy-Durrell Letter Name Learning rate and Gates Visual pre-test scores used as covariates, there will be no significant differences in performance on the Murphy-Durrell Letter Naming sub-test, the Gates Visual Perception sub-test, and the Murphy-Durrell Learning Rate Test between AVAP and AAP.

## HYPOTHESIS V.

- (A) With homogeneity of regression established and Murphy-Durrell phonemes and learning rate and Gates Auditory Perception sub-tests used as covariates, there will be no significant difference in performance on the Murphy-Durrell Phoneme Test, the Gates Auditory Perception Test between AVAP and AAP pooled, and GRP and VAP pooled.
- (B) With homogeneity of regression established and Murphy-Durrell phonemes and learning rate and Gates Auditory Perception sub-tests used as covariates, there will be no significant difference in performance on the Murphy-Durrell Phoneme Test and the Gates Auditory Perception Test between AVAP and VAP.

## STATISTICAL ANALYSIS FOR HYPOTHESIS I

Hypothesis I is tested with a multiple regression analysis of covariance using a computer program adapted from Veldman (1967). The multiple regression approach is analogous to a single classification analysis of variance. It defines a "full" model which takes into account the predictive power of group membership and compares it to a restricted model when group membership is not utilized as a predictor. A squared multiple correlation coefficient ( $R^2$ ) for both the full and restricted models is calculated and an F ratio and probability value is calculated on the basis of the  $R^2$  difference between the two models. This procedure does not require an equal number of subjects per cell.

Because the possibility exists that differences in treatment means could be attributed to differences in pre-test performance an analysis of covariance is used to test Hypothesis I.

The covariate, in this instance the pre-test score, is used as a predictor in both the full and the restricted models, thus eliminating any of the  $R^2$  difference between models that could be explained by entering knowledge or ability. A pre-condition of the analysis of covariance is the establishment of homogeneity of regression or parallelism of regression lines. The establishment of homogeneity of regression indicates that the amount of change in post-test score per unit of pre-test score is the same for all treatment groups. Models are set up to test for homogeneity of regression according to the procedures recommended in Ward and Bottenberg (1963). (See Appendix E.) The full model uses the pre-test score of each treatment group as a separate predictor, and computes partial regression weights for each predictor. The reduced model combines all treatment group covariate scores into one predictor and computes a single regression weight.

The  $R^2$  difference between models reflects the degree of difference in the relationship between individual pre- and post-test scores across treatment group. If there is no significant difference in the  $R^2$  between models, homogeneity of regression is established and the investigator is able to proceed with the regression analysis of covariance to test Hypothesis I.

#### STATISTICAL ANALYSIS FOR HYPOTHESIS II-V

A homogeneity of regression analysis between pre- and post-test performance will be tested for each hypothesis using procedures outlined for Hypothesis I. If homogeneity of regression is established a multivariate analysis of covariance will be performed using a Manova computer program adapted for small computers (Hughes, LaRue, and Yost, 1969). This Manova program provides a special contrast option which allows the investigator to pool treatment groups in making comparisons.

For testing Hypothesis II a multivariate analysis of covariance will be performed in which AVAP will be compared to the pool of GRP, AAP and VAP, with Pintner-Cunningham post-scores as the criterion and Pintner-Cunningham pre-scores as the covariate.

For testing Hypothesis III, levels will be assigned to each subject on the basis of pre-test Pintner-Cunningham performance. A level score of 1, 2 or 3 for IQ will be assigned on the basis of a subject's rank order on the pre-test Pintner-Cunningham Test, for auditory perception on the basis of pre-test rank on Gates Auditory Perception Test and for visual perception on the basis of rank order on Gates Visual Perception pre-test. Three separate multivariate double classification analyses of covariance will then be performed. The first analysis will test the interaction of group and pre-test IQ level, the second analysis will test the interaction of group and pre-test auditory level, and the third analysis will test the



interaction of group and pre-test visual level. If all three analysis yield an insignificant F value the null hypothesis will not be rejected.

Hypothesis IV and V will utilize a single classification multivariate analysis of covariance utilizing the special contrast option.

#### G. Administration of Program

##### 1. Administration of Pre-tests

Pre-tests were conducted in a two-week period prior to the introduction of the treatment regime. Several members of the University School staff, and several volunteers from the community with prior testing experience, administered the pre-tests. All standardized group tests were given on Tuesday, Wednesday, and Thursday. Manual specifications were adhered to exactly. Group size was held at the minimum level suggested by the manual, and adult-pupil ratio was held at the maximum level. Where the manual presented an option of giving the test in one or two sittings, the second option was selected. For four weeks prior to the testing program children were given daily practice in the following tasks: (a) placing a mark on a picture; (b) making an X; and (c) drawing a line under a picture.

The following pre-test measures were collected for the total study population prior to treatment:

- (a) Pintner-Cunningham Primary IQ Test.
- (b) Murphy-Durrell Reading Readiness Analysis: Phonemes Part I, Letter Names, and Learning Rate Sub-tests.
- (c) Gates-MacGinitie Reading Measures: Auditory Discrimination and Visual Discrimination Sub-tests.
- (d) Auditory-Visual Shifting Test constructed by the examiner.

In addition, teacher aide teams were asked to fill out pupil rating sheets, with each team responsible for completing the forms for twenty children.

When team members could not decide upon or agree upon a particular rating, a

supervisory teacher was consulted.

Sampling Procedures. Pre-tests were administered to a total sample of 64 children. On the bases of these pre-tests four children were eliminated from the sample. Three children zeroed out completely on the pre-tests (scribbled across the pages), and could not be assigned a score. One child was partially sighted and could not be tested.

The design called for assignment to treatment group through a double stratification procedure with random assignment to groups using a table of random numbers. Children were stratified according to sex and IQ level (upper, middle, or lower third). An examination of pre-test scores revealed three children whose IQ scores were inconsistent with their scores on the rest of the battery. IQ tests were repeated on these three children and on three other children whose IQ scores were consistent with the rest of the battery. All three children with consistent batteries measured within 5 points of their original score on the pre-test. Two children with inconsistent batteries raised their IQ score respectively by 7 and 20 points. The third child with an inconsistent pre-test battery scored within 7 points of the original testing, but turned out to have an allergic eye condition which affected the consistency of her performance. On the basis of these results it seemed appropriate to use the second IQ score for these three children.

## 2. Orientation

Teacher orientation extended over a three-day period, with the first day devoted to a group conference, and the second and third days devoted to individual conferences with each of the three teachers involved in the experimental program. The following materials were given to each of the experimental teachers at the beginning of the conference:

a. A set of behavioral objectives and suggested activities arranged in sequence (see Appendix A).

b. A teacher's manual with detailed instructions for suggested activities (see Appendix F).

c. A game kit with materials and detailed instructions for all self-corrective manipulative games to be used in the programs. These games were constructed specifically for the study in accordance with the behavioral objectives set forth (see Appendix G).

d. A set of booklets with pencil and paper activities for each child. These activities were constructed for the study in accordance with the behavioral objectives (see Appendix H).

e. A kit of records, books, and materials purchased for the study.

f. A set of tapes with cards and a listening board to be used for individualized listening activities (see Appendix I).

g. A set of individual child record sheets constructed in accordance with the behavioral objectives (see Appendix J).

Group Orientation. In the first workshop session the rationale of the treatment program was explained to the total group. Teachers were told that equally valid arguments had been advanced by experts in support of each of the four treatment methods. The purpose of the experimental study was twofold: first, to determine whether one type of treatment was on the whole more effective than another; and second, to determine whether there was a relationship between the effectiveness of a program and the pre-test profile of the student. The importance of not intermingling treatment prescriptions was stressed and restressed. Instructions were given to each teacher regarding the construction of daily lesson plans and the keeping of records. The importance of allowing children to make choices and progress

at their own individual rate was emphasized.

Individual Conferences. A total of four hours was devoted to each individual conference. During these conferences, materials specific to the teacher's curriculum area were reviewed. Behavioral objectives were explained, and suggested activities were described and/or demonstrated. At the end of the individual conference, each teacher was given an "opinionnaire" on which she was asked to evaluate the four programs in terms of their effectiveness, their ease of administration, and their child appeal. Each teacher was asked to fill out a similar questionnaire at the end of the treatment.

Informal conferences were held with each of the three teachers on a weekly basis. In addition the University investigator made herself available for questioning on a daily basis.

### 3. The Course of Treatment

The course of treatment extended over a three-month period and included a total of thirty-six instructional days. The investigator had planned for a total of sixty instructional days but several unexpected contingencies arose which eliminated a total of twenty-four treatment days. Five days were lost because of health visits scheduled by the Board of Health, four days were lost because of bus breakdowns, three days because of special programs scheduled by the OEO Office, six days because of teacher illness, four days because of unscheduled school holidays, and two days because building construction required the facility to be evacuated.

The period of time devoted to treatment per day was also cut back. Original plans called for 40-minute class periods, giving each child a total of 120 minutes or two hours per day in a treatment program. Lunch schedules and bus schedules interfered with this timetable, so that each period had to be



cut from 40 to 25 minutes. This gave each child approximately 75 minutes per day in a treatment program. The afternoon period was always apportioned so that each treatment group spent an equal period of time in each of the four classrooms, with a bell signaling the end of each period.

Contamination Checks. Colored tags were worn by all children during the course of treatment. Purple tags stood for GRP, red tags for VAP, white tags for AAP, and green tags for AVAP. The following legend was written on the chalk board in each of the experimental rooms:

Purple tags: GRP Group. No exposure to letter symbols or letter sounds.

Red tags: VAP Group. No exposure to letter sounds.

White tags: AAP Group. No exposure to letter sounds.

Green tags: AVAP Group. Expose to both letter symbols and sounds.

The three experimental or treatment classrooms were monitored by closed-circuit TV. During the first two weeks, treatment rooms were monitored three days a week. This was changed to twice a week and, finally, once a week as teachers became accustomed to the treatment procedure.

Spot classroom checks by an observer were carried three days a week during the complete course of treatments. Checks were made in both morning and afternoon classes, as no treatment-oriented materials could be introduced into the morning classes.

Two instances of contamination were detected during the first week of treatment, both involving exposure to the letter B. The first contamination involved one aide's using the letter B as the basis of a morning craft. The second instance of contamination involved a confusion of groups in the creative program where the auditory alphabet group was permitted to

color a B. In both instances the violation was pointed out, and the necessity of keeping the program pure was re-emphasized.

A third instance of contamination occurred during the final week of treatment when one of the aides introduced a craft which involved letter identification into a morning class. Again, the violation was pointed out.

Problems Arising during the Course of Treatment. One of the most serious problems that developed during the course of treatment involved aide participation. Four of the eight aides did not understand the program and were at times a source of confusion rather than a source of help in the classrooms. The investigator conducted half-hour classes with the aides every day stressing the role of the aides on a daily basis in the classroom, the use of positive reinforcement, and the basic principles of child growth and development. The videotapes used as a check of contamination in the classrooms were also used as a teaching device.

A second problem that arose during the course of treatment involved activities with the tape recorder. There were two difficulties. First, although the taped material had been used in a pilot program with a Head Start population, the material was too difficult for the children in the present study who were somewhat younger. Also, the teachers felt that the children were not able to manage the tape recorder without special supervision. As a result of this feedback, the taped portion of the program was rewritten by the investigator and simplified. During the last four weeks of treatment a high school senior doing an independent study was assigned the task of supervising the use of the tape recorder. This young man spent an equal portion of time with each treatment group, keeping records of their progress. These progress records became a part of the treatment progress records which were kept current for each child in the program.

A third problem that occurred during the course of treatment was the high rate of absenteeism. Transportation snafus, an unusual cold spell, and outbreaks of measles, chicken pox, and flu all contributed to the problem.

Attrition. Seven children were dropped from the original samples. Five of these children left the school, a sixth child was dropped from the study when it was discovered that the birthdate was wrong on her application form and she was only three years old, and a seventh child was dropped because he had been absent for seven consecutive weeks. The investigator had stated as a preliminary condition that any child absent more than two consecutive weeks would be dropped from the sample.

Follow-ups were done on the five children who left the school. In two cases, families had moved away from the area. In two other cases, the children were taken out because of "family troubles"; in the fifth case, the family would not give a reason. As a result of this attrition, the composition of the final groups was as follows: GRP, 13; VAP, 13; AAP, 14; and AVAP, 13.

#### 4. Administration of Post-tests

Post-tests were carried on during the two-week period following the treatment course by a team of testers similar to the pre-test team. Morning classroom groupings, in which treatment groups had proportional representation, were retained during this testing period. The following post-tests were administered to the total population:

- (a) Pintner-Cunningham Primary IQ Test.
- (b) Murphy-Durrell Phonemes Part I and Letter Names Sub-tests.
- (c) Gates-MacGinitie Auditory Discrimination and Visual Discrimination Sub-tests.
- (d) Linguistic Learning Rate Test constructed by the examiner.

## CHAPTER 5

### DATA ANALYSIS

#### Pre-treatment Information

Prior to the treatment, the following measures were collected on the total group: The Pintner-Cunningham Mental Ability Test, Form A; the Gates-MacGinitie Readingness Skills sub-tests II and III; the Murphy-Durrell Reading Readiness Analysis, Phonemes sub-test Part I, Letter Names sub-test Part I, and Learning Rate Test; and auditory-visual shifting test constructed by the investigator, Attending Behavior Rating, and Activity Level Rating.

Pre-test measures for the population tended to be positively skewed (see Appendix L for distributions) with a disproportionate number of children receiving zero scores on the letter names test, the learning rate test, and the Gates Visual Perception Test (see Table 2). Unfortunately, this truncated distribution could have obscured real differences in the sample that may have influenced the outcome of treatment. According to national norms, mean scores for the sample were in the 2nd stanine on standard reading readiness sub-tests and IQ. Reading readiness measures were not independent, with Letter Naming, and Gates Auditory and Visual tests significantly correlated with IQ (see Table 3).

#### Treatment Groups

A double stratified random sampling procedure was used for distribution of the sample into treatment groups. Subjects were categorized according to sex and IQ level. A raw score of 17 or under represented the cut-off point



TABLE 2

PRE-TEST SCORES N = 53  
(As Adjusted for Attrition)

TEST	GROUP MEAN	STANDARD DEVIATION	RANGE	NUMBER OF SUBJECTS WITH ZERO SCORES	NATIONAL STANINES
Pintner-Cunningham					
I.Q.	23.7	11.6	10-57	0	2
Murphy-Durrell Phonemes	6.8	3.4	0-15	1	2
Letter Names	2.4	4.37	0-17	36	2
Learning Rate	3.41	3.40	0-16	16	2
Gates Auditory	9.71	4.01	0-19	1	2
Gates Visual	3.8	3.5	0-19	10	2
1-1 Auditory	4.01	3.46	0-10	6	
1-1 Visual	5.1	3.58	0-10	2	

TABLE 3

PRE-TEST  
INTERCORRELATIONS

CHART 1

	SEX	IQ	PHONEMES	LETTER NAMING	LEARNING RATE	GATES AUDITORY	GATES VISUAL
SEX		.02	.05	.09	-.01	.16	.09
IQ			.38	** .64	.25	** .51	** .50
PHONEMES				.33	.14	.41	.17
LETTER NAME					.12	** .50	.42
LEARNING RATE						.24	.17
GATES AUDITORY							* .47
GATES VISUAL							

\*significant at the .05 level

\*\*significant at the .01 level

for low IQ, and a raw score of 24 or over represented the cut-off point for high IQ. A table of random numbers was used to place subsets from the six cells, representing sex and IQ level, into four treatment groups.

Using all pre-test scores as variables, a discriminant function analysis was performed using the Veldman Discriminant Function Program (1967). The discriminant function yielded a nonsignificant overall F ratio of 1.109 ( $p = .35$  with D.F. 18 and 124). The univariate F tests for the four treatment groups on each of the individual pre-tests were also nonsignificant. On the basis of this analysis, the original treatment assignments were maintained. In a second discriminant function analysis where study dropouts were deleted all the F ratios remained nonsignificant.

#### Teachers' Opinionnaires

The three teachers taking part in the experimental program were asked to fill out an opinionnaire in the beginning and at the end of the experimental program. This opinionnaire was designed to measure teacher reaction to the four treatment programs (see Teacher Attitude Questionnaire - Table 4). The Principal of the school was also interviewed before and after treatment (Fessler, 1969, 1970), and questioned as to her perceptions of the teacher attitudes toward the four treatment programs. According to the Principal, Teacher A was a confirmed advocate of a general readiness approach, while teachers B and C tended to be more pragmatic and more open to innovative ideas. The original opinionnaire filled out by the teachers after the workshop reflected no strong bias on the part of any of the teachers. The final opinionnaire showed a general enthusiasm for GRP, little change of opinion for AVAP, and a skepticism about the effectiveness of AAP and VAP, with teacher A assuming a strong negative position.

TABLE 4  
TEACHER ATTITUDE QUESTIONNAIRE

1 = Pre.                      2 = Post

LEGEND:  
TEACHER A = READING READINESS  
TEACHER B = LANGUAGE  
TEACHER C = CREATIVITY

	Definitely Agree	Moderately Agree	Don't Know	Disagree Mildly	Disagree Strongly
1. The Auditory Program should be easy for the teacher to follow.	A-1 C-1,2	A-2 B-1,2			
2. The Visual Program should be easy for the teacher to follow.	A-1 B-1 C-1,2	A-2 B-2			
3. The Auditory Visual Program should be easy for the teacher to follow.	A-1 C-1,2	B-1,2 A-2			
4. The General Readiness Program should be easy for the teacher to follow.	A-1 B-1,2 C-1,2	A-2			
5. The Auditory Program should work well with the children in my class.	C-1	A-1 B-2	B-1 C-2	A-2	
6. The Visual Program should work well with the children in my class.	A-1 C-1	B-1,2	C-2	A-2	
7. The Auditory-Visual Program should work well with the children in my class.	A-1 C-1,2	B-1,2 A-2			
8. The General Readiness Program should work well with the children in my class.	A-1 B-2 C-1,2	B-1 A-2			
9. The children should enjoy the Auditory Program.	A-1 B-1 C-1	B-2	C-2		A-2
10. The children should enjoy the Visual Program.	A-1 B-1 C-1	B-2	C-2		A-2
11. The children should enjoy the Auditory-Visual Program.	A-1 B-1 C-1	B-2 C-2		A-2	
12. The children should enjoy the General Readiness program.	A-1 B-1,2 C-1,2	A-2			



## Post Tests

Post-tests were conducted immediately following the experimental program with conditions closely paralleling conditions of the pre-test. Post-test measures included Pintner-Cunningham IQ, Gates Auditory and Visual Sub-tests, Murphy-Durrell Learning Rate, Letter Names, and Phonemes I Sub-tests, and a Linguistic Learning Rate Test constructed by the investigator. The Linguistic Learning Rate Test and Murphy-Durrell Learning Test were split in half. Part I of each test was administered at one sitting, and Part II of each test at a second sitting. This split-half procedure was used to circumvent the problem of differential practice effects. Means, standard deviations and Stanine scores were computed for each group on each measure (see Appendix K). Based on National norms the total group registered a mean gain of one or more stanines on all measures (see Table 5). In contrast to pre-test measures, post-test measures tended to be normally distributed (see Appendix L). The pattern of intercorrelations on the post-test also differed from the pre-test patterns. LLR, MDLR and Gates Visual were significantly correlated with each other but not with IQ, while letter names, IQ and Gates Auditory were highly intercorrelated (see Table 6).

## Statistical Analysis of Hypotheses:

(For the purpose of the analysis all hypotheses are expressed in the null form.)

Hypothesis 1A. With homogeneity of regression established and the Gates Reading Readiness Auditory Perception Pre-test scores used as a covariate, there is no significant difference in performance between AVAP and GRP on the Gates Readiness Auditory Post-test.

Statistical Analysis: This statistical analysis was tested using a multiple-regression computer program adapted from Veldman (1967). Models

TABLE 5PRE- AND POST-TEST SCORES ACCORDING TO GROUP

TREATMENT	TOTAL GROUP 53	PRE	POST	DIFFERENCE
PHONEMES	MEAN	6.8	11.6	5.2
	S.D.	3.4	3.8	
	S. ERR.	.47	.53	
	STANINE	2	3	1
LETTER NAMES	MEAN	2.4	23.8	21.4
	SD	4.3	14.4	
	S. ERR.	1.11	2	
	STANINE	2	4	2
MDLR	MEAN	3.4	9.6	6.2
	S.D.	3.5	3.9	
	S. ERR.	.56	.53	
	STANINE	2	5	3
LLR	MEAN		10.1	
	S.D.		3.3	
	S. ERR.		.46	
	STANINE			
PINTNER- CUNNINGHAM	MEAN	23.7	34.3	10.6
	S.D.	11.7	14.2	
	S. ERR.	1.61	1.95	
	STANINE	2	3	1
GATES AUDITORY	MEAN	9.8	13.6	3.8
	S.D.	3.7	4	
	S. ERR.	.51	.56	
	STANINE	2	3	1
GATES VISUAL...	MEAN	4.4	9.5	5.1
	S.D.	3.5	6.1	
	S. ERR.	.53	.85	
	STANINE	2	4	2

TABLE 6

POST-TEST INTERCORRELATIONS

Phonemes	Letter Names	Gates Auditory	Gates Visual	LLR	MDLR	IQ
Phonemes	28	32	**86	**78	**75	14
Letter Names		51	35	38	37	57
Gates Auditory			36	38	32	**64
Gates Visual				**71	**65	16
LLR					**65	30
MODL						23

for the analysis were developed in line with the procedures set up in Appendix E.

The first step of the analysis was to test for homogeneity of regression to determine whether the amount of gain per unit of concomitant variable was the same under the two treatment conditions. Establishment of homogeneity of regression would indicate that the relative effectiveness of the treatments did not vary across individuals as a function of pre-test performance level. With models set up according to the procedures defined in Chapter 3, the R Square difference between the full model and the restricted model was .059 yielding a non-significant F ratio of 3.14 with one and twenty-three degrees of freedom. With homogeneity of regression established we can then ask the question, are the GRP and AVAP equally effective for subjects with pre-test scores within the observed range? Comparison of the R Squares for the full model and the restricted model yields an R Square difference of .0066 with a corresponding non-significant F ratio of .162 ( $p < 0.85$  with 1 and 23 degrees of freedom). On the basis of this P value we cannot reject the null hypothesis that AVAP and GRP treatments are equally effective with Gates auditory perception sub-test as the criterion.

TABLE 7

Comparison Between AVAP and GRP on Gates Auditory Post-test  
with Gates Auditory Pre-test Used as a Covariate

$R^2$ Full Model . . . . .	.5300
$R^2$ Reduced Model . . . . .	.5235
$R^2$ Difference Between Models . . . . .	.0066
F Ratio with 1 and 23 Degrees of Freedom . . . . .	.162
Probability . . . . .	<.85
AVAP Mean . . . . .	13.4
GRP Mean . . . . .	14.0



TABLE 8

Comparison Between AVAP and GRP on Gates Visual Post-test  
with Gates Visual Pre-Test Used as a Covariate

$R^2$ Full Model . . . . .	.2826
$R^2$ Reduced Model . . . . .	.2780
$R^2$ Difference Between Models . . . . .	.0045
F Ratio with 1 and 23 Degrees of Freedom . . . . .	.073
Probability . . . . .	$< .93$
GRP Mean . . . . .	9.8
AVAP Mean . . . . .	8.8

Statistical Hypothesis IB. With homogeneity of regression established and the Gates visual perception pre-test scores used as a covariate, there will be no significant difference in performance between AVAP and GRP using the Gates visual perception post-test as the criterion.

A multiple regression approach was used to test this hypothesis, with models set up following the procedure defined in Chapter 3. In the test for homogeneity of regression the R-square difference between the full and restricted model was .0001 yielding a non-significant F ratio of .003 ( $p < .95$ ). In the test between models demonstrating the effect of group membership, the difference between R-square full and R-square reduced was .0045 yielding an F ratio of .073 ( $p$  value  $< .93$ ). The null hypothesis stating that there was no significant difference in performance between AVAP and GRP could not be rejected (see Table 5B).

Procedures Preliminary to Further Hypothesis Testing:

Preliminary to further statistical analysis, tests for homogeneity of regression across treatment groups were performed on all pre-test measures assigned as covariates, using the multiple regression approach. Using the procedures outlined in Chapter 3, homogeneity of regression across treatment

groups was established for all covariates with the exception of Gates Auditory (see Table 9). In the case of Gates Auditory Test the R-square difference between the full and restricted model was .13 yielding an F value of 3.13, significant at the .05 level. Homogeneity of regression between pre- and post-Gates Auditory Perception Test had already been established for GRP and VAP. It seemed appropriate, therefore, to explore the pre-post scores scattergrams for the four treatment groups (Appendix M). It is evident from the scattergrams that the relationship between pre-test and post-test scores is erratic in the VAP treatment group. Accordingly, the Gates Auditory pre-tests could not be used appropriately as a covariate in data analysis when all four groups are considered in the analysis.

Statistical Hypothesis 2. With homogeneity of regression established and Pintner-Cunningham pre-scores used as a covariate, there will be no significant difference in performance between AVAP and "GRP, AAP, and VAP" taken as a pooled group.

The Manova program was used for this analysis, using the special contrast option (Edwards, 1967), allowing a comparison between AVAP and the average of GRP, VAP and AAP. This analysis yielded an F value of 2.98, significant at the .05 level with 3 and 49 degrees of freedom. On the basis of this analysis we can reject the null hypothesis stating that there is no significant difference in post-test Pintner-Cunningham IQ scores resulting from AVAP treatment (see Table 10).

Statistical Hypothesis 3. With homogeneity of regression established and pre-test scores used as covariates, there will be no interaction effect between pre-treatment (a) auditory perception level and group, (b) visual perception level and group, (c) IQ level and group, on post-test performance.

TABLE 9

F TESTS BETWEEN MODELS FOR THE ESTABLISHMENT OF HOMOGENEITY OF REGRESSION  
WITH POST-TEST USED AS CRITERIA AND PRE-TESTS USED AS COVARIATES

## ACROSS ALL GROUPS

F TEST NUMBER	CRITERIA	COVARIATE	R SQUARE FOR THE FULL MODEL	R SQUARE FOR THE REDUCED MODEL	DIFFER- ENCE	DF OF NUMER- ATOR	DF OF DENOMI- NATOR	F VALUE	P VALUE
1	Post-tests of Murphy-Durrell Phonemes Part I	Pre-tests of Murphy-Durrell Phonemes Part I	0.0874	0.0471	0.0402	3	44	0.646	$P < 0.59$
2	Post-tests of Murphy-Durrell Learning Rate Sub-test	Pre-tests of Murphy-Durrell Learning Rate Sub-test	0.0942	0.0659	0.0282	3	44	0.457	$P < 0.72$
3	Post-tests of Murphy-Durrell Letter Name	Pre-tests of Murphy-Durrell Letter Name	0.2886	0.2795	0.0090	3	44	0.187	$P < 0.90$
4	Post-tests of Pintner- Cunningham I.Q.	Pre-tests of Pintner Cunningham I.Q.	0.6245	0.5965	.03	3	44	1.10	$P < 0.36$
5	Post-tests of Gates Auditory	Pre-tests of Gates Auditory	0.3891	0.2587	0.1303	3	44	3.13	$P < 0.03$
6	Post-tests of Gates Visual	Pre-tests of Gates Visual	0.2647	0.2559	0.0087	3	44	0.175	$P < 0.91$

TABLE 10

AVAP VS VAP, AAP AND GRP POOLED ON PINTER-CUNNINGHAM I.Q.  
MANOVA PROGRAM FOR COMPUTATION OF GROUP EFFECTS USING SPECIAL CONTRASTS

GROUPS	OBS	PINTNER-CUNNINGHAM PRE-TEST		PINTNER-CUNNINGHAM POST-TEST		
		MEANS	S.D.	MEANS	S.D.	
GRP	13	26.31	13.52	35.70	13.12	
VAP	13	20.85	7.65	29.77	14.17	
AAP	14	23.29	12.63	31.07	13.18	
AVAP	13	24.14	12.57	41.14	14.48	
CONTRASTS	WEIGHTS	CRITERION	COVARIATE	DF	F VALUE	P VALUE <
AVAP vs. VAP, AAP & GRP	.33 .33 .33 -1	Post P.C. I.Q.	Pre P.C. I.Q.	3.49	2.962	.041



For this analysis, each subject was assigned a level score of 1, 2 or 3 for visual, auditory and IQ level, according to the ordinal position of his associated pre-test scores on the Gates visual and auditory pre-tests and the Pintner-Cunningham IQ test. In each case, individuals scoring in the lower third of the distribution were assigned a 1, in the middle third a 2, and in the upper third a 3.

Using the Manova program with a 3 x 4 factorial design, three analyses were performed testing the interaction effect of pre-treatment auditory level and group, pre-treatment visual level and group, and pre-treatment IQ level and group. No significant interaction effects were revealed (see Table 11), and the null hypothesis could not be rejected.

Statistical Hypothesis 4. With homogeneity of regression established and the Murphy-Durrell letter names, learning rate, and the Gates visual perception scores used as covariates, there will be no significant differences in performance (a) between AVAP and VAP pooled and GRP and AAP pooled, and (b) between AVAP and AAP on post-test performance using the Murphy-Durrell letter names sub-test, the Gates visual perception sub-test, and the Murphy-Durrell learning rate sub-test as the criteria.

A multivariate analysis of variance with special contrasts was used to test this hypothesis. In the first analysis AVAP and VAP (where treatment included visual alphabet training) were combined, and AAP and GRP (the groups that did not receive visual alphabet training) were combined. The analysis yielded a nonsignificant F value of 1.5, ( $p < .19$ ). However, the univariate test with the letter name sub-test approaches significance, yielding a F value of 3.817 and a probability value of .056 (Table 12).

The multivariate analysis comparing AVAP and AAP on letter names and Murphy-Durrell Learning Rate yields an F value of 3.4, significant at the .05 level.

TABLE 11

MANOVA FACTORIAL DESIGN FOR COMPUTATION OF INTERACTION EFFECTS  
 MULTIVARIATE TESTS OF SIGNIFICANCE USING WILKS LAMBDA CRITERION

FACTORS	CELLS	F VALUE	DEGREES OF FREEDOM FOR HYPOTHESIS	DEGREES OF FREEDOM ERROR	PROBABILITY LESS THAN
AUDITORY PERCEPTION LEVEL & GROUP	12	1.263	30	130	.19
VISUAL PERCEPTION LEVEL & GROUP	12	.946	30	130	.55
IQ LEVEL AND GROUP	12	1.4412	30	130	.08
SEX AND GROUP	8	.663	15	47	.81

TABLE 12

## MULTIVARIATE ANALYSIS WITH VISUAL MEASURES

MANOVA PROGRAM FOR COMPUTATION OF GROUP EFFECTS USING SPECIAL CONTRASTS

GROUPS	OBE	PRE-LETTER NAMES			POST-LETTER NAMES			PRE-MDLR			POST-MDLR			GATES VISUAL PRE			GATES VISUAL POST		
		Means	S.D.		Means	S.D.		Means	S.D.		Means	S.D.		Means	S.D.		Means	S.D.	
GRP	13	2.2	4.3		20.1	13.1		3.0	4.0		9.6	3.7		10.5	4.5		14.1	3.2	
VAP	13	3.7	5.3		26.4	13.2		2.8	2.9		9.4	3.7		8.9	4.0		14.1	4.0	
AAP	14	2.6	3.9		19.1	16.3		3.5	4.5		8.1	4.1		10.1	2.8		13.0	4.1	
AVAP	13	1.6	4.7		29.4	14.8		5.0	3.4		11.1	4.1		10.1	3.8		13.5	5.1	

CONTRASTS	WEIGHTS	CRITERION	COVARIATE	DF	F VALUE	P VALUE
AVAP & VAP vs. GRP and AAP	1 -1 1 -1	MDLR Post Letter Names Post Gates Vis. Post	MDLR Pre Letter Names Pre Gates Vis. Pre	1	1.5	.19
AVAP vs. AAP	0 0 -1 1	MDLR Post Letter Names Post	MDLR Pre Letter Names Pre	1	3.4	.04

The univariate F value for the letter name test was 5.53 and for the Murphy-Durrell Learning Rate Test 5.55 with P values of .038 and .022 respectively (Table 12).

On the basis of this analysis, we cannot reject Hypothesis 4, Part I, asserting that there will be no significant difference in performance on visual measures between groups given specific visual alphabet training, and groups not given specific alphabet training. We can, however, reject Part II of the Hypothesis. There is a significant difference on visual measures between AVAP and AAP, the group that received auditory and visual alphabet training, and the group that received only auditory alphabet training. In the univariate tests the visual measures show significant differences while the auditory measures do not (Table 13).

Statistical Hypothesis 5. With homogeneity of regression established and Murphy-Durrell Phonemes and Learning Rate Tests used as covariates, there will be no significant difference in performance on the Murphy-Durrell phoneme tests between (1) AVAP and AAP pooled, and GRP and VAP pooled, or (2) between AVAP and VAP (Gates Auditory Perception sub-test is omitted from the analysis as homogeneity of regression was not established (Table 14).

Hypothesis 2 was tested with a multivariate analysis program again using the special contrast option. Combining AVAP with VAP and GRP with AAP, specific auditory alphabet training groups with nonspecific auditory alphabet training groups, the analysis yields a nonsignificant F value of 1.341 ( $p$  less than .2666) with no significant univariate F tests. The null hypothesis, therefore, cannot be rejected.



TABLE 13

MANOVA PROGRAM FOR COMPUTATION OF GROUP EFFECTS USING SPECIAL CONTRASTS

UNIVARIATE F TESTS AVAP VS. AAP

<u>VARIABLE</u>	<u>F VALUE</u>	<u>P VALUE</u>
Post PCIQ	10.675	.002
Post LLR	.277	.60
Post-Phon	.103	.759
Post-Mdlr	3.89	.05
Post-Ltr Name	5.69	.02

TABLE 14

## MULTIVARIATE ANALYSIS WITH AUDITORY MEASURES

MANOVA PROGRAM FOR COMPUTATION OF GROUP EFFECTS USING SPECIAL CONTRASTS

GROUPS	OBS	PRE-PHON		POST-PHON		PRE-MDLR		POST-LLR	
		Means	S.D.	Means	S.D.	Means	S.D.	Means	S.D.
GRP	13	8.0	4.0	11.8	3.5	3.0	4.0	10.1	4.2
VAP	13	6.2	3.3	9.9	3.1	2.85	2.88	9.3	3.1
AAP	14	8.1	3.9	11.7	4.0	3.5	4.5	11.1	2.8
AVAP	13	6.4	2.5	12.4	5.4	4.9	3.4	10.1	3.1
CONTRASTS		WEIGHTS		CRITERION	COVARIATE	DF	F VALUE	P VALUE	
(1) AVAP & AAP vs. GRP & VAP		1	1 -1 -1	Post 1lr Post Phon	Pre MDLR Pre Phon	1	1.44	.23	
(2) AVAP vs. VAP		0	-1 0 1	Post 1lr Post Phon	Pre MDLR Pre Phon	1	1.34	.26	
(3) AVAP vs. AAP		0	0 -1 1	Post 1lr Post Phon	Pre MDLR Pre Phon	1	.56	.69	

# QUESTIONS FOR INVESTIGATION:

I. Do children who perform better on a visual test than on a test requiring an auditory-visual shift have difficulty with word learning tasks? The auditory visual shifting test measured performance on a task requiring a grasp of the concept of one-to-one correspondence. The interest of the investigator was focused on the differential in performance between the first part of the test where the child matched two visual stimuli, and the second part where he matched an auditory stimulus with a visual stimulus. The mean performance of the group on the visual task was 5.1, and on the auditory task 4.01. Eighteen children, approximately one-third of the group, got 2 or less on both the visual and the auditory-visual tasks. As these subjects did not succeed with the task in either form, differential scores for these subjects contribute no information. In the remaining group, three subjects received scores more than 3 points higher on the auditory-visual than on the visual, while 13 children scored 3 or more points higher on the visual than on the auditory-visual. It appeared that the test could measure visual shifting behavior for only those children who grasped the concept of one-to-one correspondence.

Although auditory-visual shifting as measured by the auditory visual shifting test was positively correlated in the post-test with IQ ( $r=.24$ ) shifting scores are not correlated with learning rate in either learning rate test.

Murphy-Durrell Learning Rate & Auditory Visual Shift  $r = -.16$

Linguistic Learning Rate & Auditory Visual Shift  $r = -.03$

These correlation figures suggest that an auditory-visual shifting measure may provide information about learning potential over and above the information provided by IQ, if a more effective measure were utilized (see Table 15).

TABLE 15  
CORRELATIONS BETWEEN PRE- AND POST-TESTS

AV SHIFT	EXCESS	INSUFF	GA PRE	GA POST	PHON PRE	PHON POST	MDLR PRE	MDLR POST	GATES V PRE	GATES V POST	ABC PRE	ABC POST	LLR PRE	LLR POST	IQ PRE	IQ POST	AGE
AV	14	-19	01	16	-12	-06	02	-16	31	10	13	13	-03	27	21	-07	
EXCESS		04	-30	-17	-02	-24	-04	11	11	11	11	01	-18	-07	-08	22	
INSUFF			-34	-33	-15	-13	-13	-25	-11	-19	10	-34	-22	-31	-36	-24	
GA PRE				*60	54	52	46	46	31	51	58	50	52	38	49	12	
GA POST					32	32	18	32	27	36	46	51	38	42	**64	06	
PHON PRE						**75	52	59	-00	**75	**67	22	**68	01	21	15	
PHON POST							55	**75	-08	**86	**66	28	**78	-14	14	01	
MDLR PRE								39	08	49	44	14	55	06	18	-04	
MDLR POST									-02	**77	53	37	**65	07	23	16	
GATES V PRE										16	19	37	-11	44	35	12	
GATES V POST											**70	35	**71	07	16	-01	
ABC PRE												39	**73	22	37	-05	
ABC POST													34	47	57	-05	
LLR POST														15	30	-15	
IQ PRE															**73	06	
IQ POST																15	

( \* significant at the .05 level.  
\*\* significant at the .01 level.)



II. There is a significant correlation between teacher rating scales and pupil performance as measured by the pre-test and/or post-tests. Because the investigator was interested in determining the relationship between activity level and test performance two total scores were developed on the basis of the rating sheet: 1) a composite score of excesses, representing the number of points above three recorded for a subject, and 2) a total score of insufficiencies, representing the number of points below 3 recorded for a subject, where a score of three represented "appropriate" behavior. The maximum possible score for both insufficiencies and excesses was 18, or two times the number of items (see Table 16).

TABLE 16

ACTIVITY I. BEHAVIORAL TOTAL SCORES:

	<u>MEAN</u>	<u>STANDARD DEVIATION</u>	<u>NUMBER OF ZERO SCORES</u>
TOTAL EXCESSES	4.92	5.06	11
TOTAL INSUFFICIENCIES	2.60	3.43	18

The Attending Behavior items were not totalled, as a composite score would mask information that might be provided by the individual items (see Table 17).

TABLE 17

Pupils Attending Behavioral Rating Sheet ResultsPRE-TEST TOTALS:

<u>Item</u>	<u>Attention Span</u>	<u>Responsive-ness</u>	<u>Physical Health</u>	<u>Attitude Toward School</u>	<u>Ability to Follow Directions</u>	<u>Independence</u>
Means	2.57	2.72	3.85	3.15	2.63	2.83
Standard Deviations	.96	.97	.55	.84	1.14	1.12

Correlations between rating scale scores and pre-test scores revealed some interesting patterns. Total insufficiencies were negatively correlated with all learning rate measures with the highest negative correlation  $r = -.41$  between insufficiencies and Gates Auditory. Total excesses, on the other hand, showed slight positive correlations with some pre-test measures, including phonemes and learning, and very slight negative correlations with others; including IQ, the Gates sub-tests, and letter naming. Items on attending behavior scales were all positively but not significantly correlated with pre-test measures (see Table 18). There were no significant correlations between post-test and any pupil ratings.

III. Is the relative importance of auditory and visual training determined to any degree by the methodology used in teaching reading?

VAP, where visual alphabet perception was stressed, had a higher mean gain score than all other groups on the Murphy-Durrell Learning Rate Test where an irregularly spelled word list grouped according to meaning was presented with a look-say approach. AAP, the group that stressed auditory alphabet perception had the highest mean score on the LLR test where a list of regularly spelled words were grouped according to spelling pattern and presented in triplets where only the first phoneme changed (bat, cat, rat). Mean differences between VAP and AAP were not statistically significant (see Appendix K).

There was a significant difference on a univariate test between AVAP and AAP on the MDLR,  $F$  value 3.89,  $p < .05$ , but not on the LLR,  $F$  value .277,  $p < .60$ , indicating that the addition of a visual perception component had a different affect on the two learning tests.

TABLE 18

CHART II. CORRELATION TABLE - TEACHER RATINGS WITH PRE-TEST MEASURES

	SEX	IQ	PHONEMES	LETTER NAME	LEARNING RATE	GATES AUDITORY	GATES VISUAL
EXCESSES	-.32	-.01	.13	.10	.13	-.23	-.14
INSUFFICIENCIES	.07	-.36	-.12	-.15	-.20	-.41	-.16
ATTENTION SPAN	.00	.41	.27	-.43	-.03	-.39	.27
RESPONSIVENESS	-.08	.47	.23	.41	.06	.44	.30
PHYSICAL HEALTH	-.27	.20	.02	.11	.15	.18	.26
ATTITUDE TOWARD SCHOOL	-.22	.30	.21	.26	.19	.32	.32
ABILITY TO FOLLOW DIRECTIONS	-.05	.41	.14	.45	.10	.41	.24
INDEPENDENCE	0.00	.41	.18	.41	.11	.38	.17

## CHAPTER 6

### DISCUSSIONS & CONCLUSIONS

The purpose of the present study is to provide information that can be helpful in planning a kindergarten perceptual program for the SEL I black child. Although the experimental hypotheses of the investigator are not supported in every instance, the study provides information that sheds light on several pivotal issues involving perceptual training.

The first issue concerns the appropriate sequencing of a perceptual training program. Educators who advocate placing the SEL I black kindergarten child on a program that emphasizes general readiness non-alphabet skills assume a hierarchical model in which a cluster of lower-order perceptual sub-skills serve as prerequisites for higher-order perceptual sub-skills directly involved in decoding. Because the black SEL I child is known to lack mastery of the lower-order sub-skills, he is placed on a general readiness program in the kindergarten year.

The first hypothesis in the present study assumes the position that the SEL I child will be just as successful on a program that stresses alphabet skills as he will be on a program that stresses general readiness non-alphabet skills. This hypothesis is supported. There is no significant difference between AVAP and GRP on post-test measures of auditory and visual perception. On the Gates Auditory post-test, GRP registers a mean gain of 3.6 raw score points compared with a mean gain of 3.4 for AVAP,



and on the Gates Visual post-test GRP shows a mean gain of 4.2 compared with a mean gain of 5.7 for AVAP. The assumption of a hierarchical model in which lower level non-alphabet skills are prerequisites for higher-order alphabet skills is not validated by the data in the present study. The outcome of the study would be consistent, however, with a theoretical position asserting that the crucial element in a perceptual program is not the kind of symbol that is perceived or manipulated, but the operations involved in their perception or manipulation. It may not be important in terms of a child's development whether he deals with geometric or alphabetic symbols. What may be important is the mental operation, the attending filtering, focusing, matching, serializing or categorizing processes required by the task. If the task demands in AVAP and GRP are equally appropriate for the SEL I black child, the type of visual or auditory symbols manipulated in the tasks they provide would not be critical.

A second, and closely related issue, is whether the child's pre-test profile can provide information which will allow the teacher to decide what kind of perceptual program would best serve his needs. In the present study there was no interaction between treatment group and, pre-test IQ level, visual perception level as measured by Gates Visual sub-test, or auditory perception level as measured by Gates Auditory sub-test. These findings do not preclude the possibility of matching treatment to pre-test profile. They do suggest that assignment to a particular treatment group cannot be made simply on the basis of IQ, or on the basis of selected readiness measures. The practice of placing low IQ children in a general readiness program, and higher IQ children on an alphabet skill program is not supported.

The third issue concerns the relative effectiveness of visual and auditory alphabet training programs. Here there are four concerns:

- a. Are the development of auditory and visual alphabet skills linked to maturation, or can their development be accelerated through training?
- b. Does auditory training improve auditory skills and visual training improve visual skills?
- c. What is the relative importance of visual and auditory training in preparing a child to read?
- d. Is the relative importance of auditory and visual perceptual training determined to any extent by the methodology of a subsequent reading program?

a. Are the development of auditory and visual alphabet skills linked to maturation, or can their development be accelerated through training? The correlation of age with other readiness measures used in the present study provides some information relative to this question. None of the post-test readiness measures are significantly correlated with age. Four of the seven correlation coefficients between age and readiness scores are positive, three are negative. Apparently maturation alone cannot explain perceptual development. The effect of training on development, however, still remains an intricate one.

b. Does auditory training improve auditory skills and visual training improve visual skills? This question cannot be answered definitively on the basis of the present study. The investigator hypothesized that AVAP and AAP would outperform VAP and GRP on auditory alphabet measures, and that AVAP and VAP would outperform AAP and GRP on visual perception

alphabet measures. These hypotheses were not supported. One of the difficulties here is the problem of sub-test validity. The investigator divided the reading readiness sub-tests into two categories, auditory and visual, according to their apparent content. Gates Visual, Murphy-Durrell Learning Rate, and Letter Names were classified as visual, and Gates Auditory and Murphy-Durrell Phonemes were classified as auditory. Examination of the task requirements and intercorrelation patterns of these tests indicates that other classificatory schemes are possible. Four of the post-tests, LLR, MDLR, Gates Visual, and Phonemes, are significantly intercorrelated, but are not correlated with IQ. The common and critical element in each

<u>LLR</u>	<u>MDLR</u>	<u>GATES VIS.</u>	<u>PHONEMES</u>	<u>IQ</u>
LLR	** .65	** .71	** .78	.30
MDLR		.49	** .75	.23
GATES VIS.			** .86	.16
PHONEMES				.14

(\*\* significant at the .01 level)

of these tests may be the ability of the child to make an auditory or visual discrimination and/or association. The other two reading readiness tests, Letter Naming and Gates Auditory, are correlated with each other,  $r = .51$ , and also with IQ. The correlation is .64 between Gates Auditory and IQ and .57 between Letter Naming and IQ. An examination of the task demands of the Letter Name and the Gates Auditory sub-tests suggests that both these tests require the interpretation of a visual symbol. In the Gates Auditory test, for instance, when the examiner says, "marks, march," the critical feature may not be the child's ability to discriminate between the two words he hears, but his ability to identify the symbol for "marks"

and the drawing that is representative of the word "march." In the Letter Name test, the examiner names a series of letters which the child must mark off on an answer sheet. In order to mark off the appropriate letter, the child must be able to identify its critical features. It may be that the Gates Auditory and the Letter Naming sub-test measure an ability to deal with symbolic content which is different from the discrimination and association ability that is tapped on the other sub-tests.

Although the "auditory vs. visual" is not the only classificatory scheme that can be used to group the sub-tests, the mean scores on the sub-tests indicate a trend in the direction of the original hypothesis. The mean gain score for AAP-AVAP on the Phonemes test was 4.8, compared to a mean gain score for GRP - VAP of 3.75. The mean gain score for AVAP - VAP on the Letter Names test was 24.8, compared to a mean gain for GRP - AAP of 17.1.

C. What is the relative importance of visual and auditory training in preparing a child to read? Although there is no significant difference between VAP and AAP in the reading readiness measures in the multivariate sense, AVAP is significantly better than AAP ( $p < .05$ ), but not significantly better than VAP, indicating that the VAP program had a greater immediate effect on the reading readiness measures than the AAP program. An examination of the rank order of the four treatment groups gives additional support to the claim that the VAP program is superior to AAP. It is possible, however, that the teachers' original prediction as to treatment outcome may have served as a self-fulfilling prophecy and influenced the results.



RANK ORDER OF TREATMENT GROUPS ON SUB-TESTS

	1	2	3	4
Letter Name	AVAP	VAP	GRP	AAP
Gates Audit.	VAP	GRP	AVAP	AAP
IQ	AVAP	GRP	VAP	AAP
LLR	AAP	AVAP	GRP	VAP
MDLR	VAP	GRP	AVAP	AAP
Gates Visual	VAP	AVAP	GRP	AAP
Phonemes	AVAP	VAP	GRP	AAP

d. Is the relative importance of auditory and visual perceptual training determined to any extent by the methodology of a subsequent reading program? This question concerns the differential effects of VAP and AAP on word-list learning with two different types of tests -- the MDLR test which uses irregularly spelled words grouped according to meaning, and the LLR test using a list of regularly spelled words grouped according to spelling pattern similarities. A comparison of the performance of the four groups on the two learning rate tests reveals some interesting trends. The research hypothesis predicting that VAP and AVAP would outperform AAP and GRP on the Murphy-Durrell Learning Rate test, and that AAP and AVAP would outperform VAP and GRP on the Linguistic Learning Rate Test was not supported. Nevertheless, when we compare the mean scores and mean difference scores of the four treatment groups on the Linguistic Learning Rate Test and the Murphy-Durrell Learning Rate Test, the outcome is in the direction of the research hypothesis. GRP and AVAP, the two groups that had

	LINGUISTIC LEARNING RATE TEST		MURPHY-DURRELL LEARNING RATE	
	<u>MEAN</u>	<u>S.D.</u>	<u>MEAN GAIN</u>	<u>S.D.</u>
VAP	9.3	3.1	6.5	3.6
AAP	11.1	2.1	4.5	3.2
GRP	10.0	4.2	6.0	3.2
AVAP	10.1	3.2	5.5	4.0

equal stress on auditory and visual input, had almost identical mean scores on the Learning Rate test. VAP, where visual training was stressed, scores highest on the MDLR and lowest on the Linguistic Learning Rate test. AAP, where auditory training was stressed, scores lowest on the MDLR and highest on the LLR. Considering that the LLR and MDLR are highly correlated, ( $r = .65$ ) and follow an almost identical format, these differences are particularly interesting. Although the present study does not provide grounds for making inferences, it does suggest that a replication study with perhaps a larger  $n$ , and a longer and more consistent training period, might be in order. If, in fact, auditory training is relatively more important than visual training for word-learning when a linguistic program is followed, and visual training is more important than auditory when a look - say approach is followed, there are definite implications for reading readiness programs. It may be that reading readiness programs should be modified in accordance with the type of reading program projected for the child.

The fourth issue concerns the relative overall effectiveness of the four treatment programs for the SEL I kindergarten child. Because of the limited predictive validity of reading readiness measures, and the relative

stability of IQ, the investigator selected IQ as the basis for evaluating the four treatment programs. Here the statistical findings are decisive. After 36 days of treatment, controlling for pre-test performance, AVAP performed significantly better than GRP, VAP and AAP pooled on the Pintner-Cunningham Primary Ability Test. In terms of raw scores, the mean score gain for the AVAP group was 16.6 compared to 9.3 for GRP, 8.9 for VAP and 7.8 for AAP. In addition, while three subjects in GRP, VAP and AAP showed a loss between pre- and post-tests, all subjects in AVAP gained 4 or more points between pre- and post-tests.

The question arises, then, as to what it was about AVAP that created the significant difference. AVAP differed from GRP in that it stressed alphabet rather than general readiness skills. The differences in post-test performance, however, were not in the reading readiness scores that were intended to measure the alphabet skills, but in the IQ test that was intended to measure primary ability. A plausible explanation of these results may be that the children in the AVAP program, receiving dual modality input as well as experience with new and challenging tests, learned a new set of behaviors rather than a new set of skills. The superior performance of the AVAP group on the IQ test was not predicted by the teachers. The opinionnaires indicated that teachers were unanimous in their feeling that GRP was as or more effective than AVAP, and that the children found the GRP program more enjoyable. This discrepancy between teacher opinion and testing outcome could have been based on the fact that space limitations placed constraints on the alphabet groups that were not placed on the general readiness group. The afternoon classes were held in classrooms which were used in the morning for a pre-kindergarten program. These

rooms were well equipped with general readiness perceptual material. The GRP children were the only group that could be allowed free access to this material.

A final and most important question raised by the study concerns the overall effectiveness of treatment for the total population. Considering that the children had spent a month prior to treatment practicing tasks that involved listening to directions and making appropriate written responses, the differences in scores between pre-tests and post-tests cannot be attributed to the practice effect of making marks on paper. An examination of the mean stanine gains (based on national norms) for the total group after 36 days of treatment, attests to the effectiveness of the total curriculum. The total group gained one stanine point on Murphy-Durrell phonemes, Gates Auditory and Pintner-Cunningham IQ, two stanine points on Gates Visual perception sub-test, and three stanine points on Murphy-Durrell Learning rate test. No one group, however, outperformed the other three groups on all reading readiness post-test measures. In addition, each of the four treatment groups gained at least one stanine point on each of the six post-tests. Considering the length of the treatment period, these stanine gain scores are impressive. They cannot be explained solely on the basis of maturation or specific skill training. Perhaps the real learning that took place in the program involved a kind of task orientation. Through interaction with a carefully structured environment, the children may have learned to filter out irrelevant stimuli, and attend to the critical features of a task. Active participation in a task-oriented learning environment may have given them a better grasp of the idea of a task, and taught them how to mobilize their cognitive resources for more



effective performance. Whether or not this kind of learning will have a lasting effect on performance cannot be predicted. It may well depend on the kind of experiences these children encounter as they continue through the system.

#### LIMITATIONS OF THE STUDY

Limitations in the study can be attributed to flaws in the research design itself, difficulty with procedures, and problems associated with the restrictions imposed by the setting.

#### LIMITATIONS ATTRIBUTABLE TO DESIGN

Although the design controlled for contamination resulting from teacher behavior, it did not control for contamination resulting from student behaviors. Students in AAP were heard singing alphabet songs on their way to and from class, and children on the VAP program were observed drawing letters on the chalk-board during morning classes.

#### LIMITATIONS ATTRIBUTABLE TO PROCEDURE

Reliability and validity could not be established for the Auditory Visual Shifting Test and the Linguistic Learning Rate Test.

#### LIMITATIONS ATTRIBUTABLE TO THE SETTING

The major limitations of the study are attributable to the setting. The n of 60, representing the total population available in the setting, is small, the teacher aides with the program were untrained, and only two out of the three teachers supervising the afternoon program were certified. The course of treatment, and the length of treatment time per day, were drastically shortened due to such contingencies as bus breakdown, health visits, building repairs, and teacher absence. The classroom-sharing and storage problems made it difficult for the teacher to change the materials

in the classroom according to treatment specifications. Thus, the AVAP, VAP, and AAP children were not permitted access to open shelves containing general readiness materials.

#### SUGGESTIONS FOR FURTHER RESEARCH

Because of the limitations of the present study, a replication study with a larger n, a more adequate staff and a longer training period may be in order. The following questions could be pursued in a replication study:

- (1) Are there differences in performance on reading readiness measures associated with treatment groups?
- (2) Is a program stressing visual and auditory alphabet skills more effective than a program stressing general readiness perceptual skills?
- (3) Does a group trained in auditory perception perform better on auditory measures of reading readiness, and a group trained in visual perception perform better on visual measures of reading readiness? (In answering this question it may be advantageous to use a different set of reading readiness measures as criterion.)
- (4) Does the visually trained group perform better on the Murphy-Durrell Reading Readiness measure, and the group trained in auditory perception perform better on the Linguistic Learning Rate test?
- (5) Are gains in post-test performance maintained over time?

- (6) Are there differences in reading performance in the first grade attributable to treatment? If so, are these differences maintained in the upper grades?
- (7) Are there differences in non-reading measures including language, mathematics, attending behaviors, and affect associated with treatment?
- (8) Would four weeks of VAP followed by four weeks of AAP or vice versa be as effective as eight weeks of AVAP?
- (9) Do the teacher rating sheets assessing attending behaviors and activity level contribute to the prediction of reading readiness and/or reading achievement?
- (10) What is the relationship between success within treatment as measured by the behavioral objectives and post-test scores?

Additional Research Questions:

- (1) Is there a relationship between auditory-visual shifting behavior and reading readiness performance?
- (2) Would the effects of treatment be the same with a non-SEL I population?

SUMMARY AND CONCLUSIONS

The present study compares the effectiveness of four different perceptual training prescriptions introduced into a structured curriculum with a population of 60 SEL I kindergarten children.

FINDINGS:

- (1) There is no significant difference in performance on reading readiness measures between the group that received general readiness training and the group that received auditory and visual alphabet skill training.
- (2) The auditory-visual alphabet group performed significantly better than the auditory alphabet group on visual measures but not on auditory measures. There is no significant difference in either auditory or visual measures between the auditory-visual treatment group and the visual treatment group.
- (3) The findings of this study provide no basis for matching pre-test profile with type of modality training program.
- (4) The group trained in auditory visual alphabet registered significantly higher gains on the Pintner-Cunningham Primary Mental Ability test than all other groups taken in combination.
- (5) All four treatment groups register gains of one or more stanine points on all reading readiness measures after 36 days of treatment.
- (6) The study demonstrates the feasibility of testing four treatments in a single setting where the teacher variable is controlled by training the teachers to use four different instructional methods.



A by-product of the present study is a total kindergarten curriculum with demonstrated effectiveness with the SEL I child. A sequence of behavioral objectives was developed in the areas of language and perception, and a set of general objectives was developed for the creativity program. Lists of suggested activities accompanied all behavioral objectives, and appropriate teacher manuals and instructional materials were provided. All instructional materials that were not commercially available were constructed for the program. The total curriculum was individualized with major emphasis on individual and small group activity. A record-keeping system was developed in accordance with the behavioral objectives so that progress could be assessed on an on-going basis.

## APPENDIX A: OBJECTIVES

GENERAL READINESS PROGRAMAUDITORY PERCEPTION

	Code
I. Behavioral Goal: Discriminates between like and unlike sounds with eyes shut.	
Suggested Activity 1: Listening Game: Children sit in a circle. Each child takes a turn dropping two objects (e.g., penny, chalk board eraser, paper clip, pencil, etc.). Children are asked to raise their hands when objects are different.	TM(1)
Suggested Activity 2: Identifies like and different sounds using tape.	GRAP Tape #1
II. Behavioral Goal: Identifies a sound stimulus with eyes shut.	
Suggested Activity 1: Listening Circle: Children sit in circle. Teacher allows the children to see and hear the sound of all objects, etc., to be used in the activity. Each child takes a turn producing different sounds.  Level I: Name object that has been dropped. Level II: Name 2 objects that are dropped. Level III: Name activity of child (i.e., clapping hands, stamping foot, opening and shutting a book, bouncing a ball, etc.).	TM(2)
Suggested Activity 2: Tape presentation of sounds	GRAP TAPE #2 DLM Tape set in kit
Suggested Activity 3: Mighty Mouse Game: Identify by voice quality: "I am Mr. Mighty Mouse. Who is coming to my house?" Mighty Mouse must identify caller before allowing him in the house.	TM(3)

GENERAL READINESS PROGRAM

AUDITORY PERCEPTION (Continued)

	Code
<p>III. Behavioral Goal: Ability to conceptualize sound-producing property of a graphically represented item, and discriminate between items that produce sound spontaneously and items that must be made to sound.</p> <p>Suggested Activity: Put a mark on every picture that can make a sound by itself.</p>	GRAP SET (1) Booklet
<p>IV. Behavioral Goal: Categorize items presented pictorially according to sound quality.</p> <p>Suggested Activity: Mark off items that make the same kind of sound.</p>	
<p>V. Behavioral Goal: Ability to recognize and imitate graduations in volume.</p> <p>Suggested Activity 1: Whisper Game: Child 1 stands up and either whispers or shouts, "I have a pencil." Next child speaks out in contrasting volume, "I have a kitten."</p> <p>Suggested Activity 2: "Shout Out" Using familiar nursery rhyme or round, children choose a "whisper it" word and a "shout it" word, and shout or whisper accordingly as they say the rhyme.</p>	TM(4) Collection of small items
<p>VI. Behavioral Goal: Ability to identify rhyming objects.</p> <p>Suggested Activity 1: Using a set of rhyming objects, find the rhyming pair.</p> <p>Suggested Activity 2: Find rhyming pairs on stenciled sheet.</p>	TM(5)  Set of rhyming objects  GRAP Set 3

GENERAL READINESS PROGRAM  
AUDITORY PERCEPTION (Continued)

	<u>Code</u>
<p>VII. Behavioral Goal: Demonstrates short-term and memory for up to eight different items.</p> <p>Suggested Activity: "I went to the grocer's and all I bought was ...." (Each child repeats the list and contributes a new item.)</p>	TM(6)
<p>VIII. Behavioral Goal: Quick recall of auditory sequence, with up to five random number or nonsense sounds.</p> <p>Suggested Activity: Password. Teacher says five numbers or nonsense syllables. Child repeats retaining same sequence.</p>	TM(7)
<p>IX. Behavioral Goal: Repeats a rhythmic pattern with up to five beats.</p> <p>Suggested Activity: Using a percussion instrument (spoon and tin can are very suitable), teacher beats a rhythm and group repeats it.</p>	
<p>X. Behavioral Goal: Associates motor pattern and rhythmic pattern.</p> <p>Suggested Activity: Rhythm and action pattern games.</p>	TM(8)
<p>XI. Behavioral Goal: Reproduces short language rhythm.</p> <p>Suggested Activity: Beats out name or verse.</p>	TM(9)
<p>XII. Behavioral Goal: Identifies a song by its rhythmic pattern.</p> <p>Suggested Activity: Teacher beats out a song and children identify it. Children use tape recorder and select picture identifying song from group of three pictures.</p> <p style="padding-left: 40px;">Yankee Doodle          Lazy Mary          Mary Had a Little Lamb.</p>	



GENERAL READINESS PROGRAM  
AUDITORY PERCEPTION (Continued)

	<u>Code</u>
XIII. Behavioral Goal: Determines the origin of a sound.	
Suggested Activity 1: Hide-A-Noise: Three children in group hide bells. Children must listen to sound of bell as it is being hidden.	
Level II: Hide object that does not make a noise. Whistle at hiding spot.	TM(10)
Level III: Hide object that does not produce a sound; do not whistle.	TM(8)
Suggested Activity 2: Barn Yard Quackery: Up to three children are given plastic eggs. Fourth child selected as Farmer Jones must find the eggs by determining who is quacking	TM(11)
XIV. Behavioral Goal: Recalls sequence of sounds.	
Suggested Activity 1: Child listens to series of tapes. Lines up pictures according to the temporal order of the sounds.	
XV. Behavioral Goal: Follows three directions presented sequentially.	
Suggested Activity 1: Moon March: Each astronaut is told to take 3 different kinds of steps to reach space capsule.	TM(12)
XVI. Behavioral Goal: Ability to produce identifiable animal noises.	
Suggested Activity: Noah's Ark: Each pair of children are given an animal picture. Chant, "Animals are marching two by two. Noah, won't you let them through?" Two children (gatekeepers) form	Cards in Kit

GENERAL READINESS PROGRAM  
AUDITORY PERCEPTION (Continued)

XVI. (Continued)

arch. Two marching children make appropriate sound for animal they represent. If the teacher can identify the animals, she calls, "Come in little kittens." The gatekeepers let the animals come through. The game continues until everyone has come through and into the ark.

Code

TM(13)

GENERAL READINESS VISUAL PERCEPTION

Code

- |   |  |
|---|--|
| <p>I. Behavioral Goal: Sorts according to primary color.</p> <p>Suggested Activity 1: Sorts pegs according to color, using red, yellow, blue, green, orange and purple pegs.</p> <p>Suggested Activity 2: Sorts different shaped objects according to color (crayons, chips, pegs, disks).</p>  | <p></p>  |
| <p>II. Behavioral Goal: Ability to identify and match like pictures.</p> <p>Suggested Activity 1: Cube matching puzzles.</p> <p>Suggested Activity 2: Lotto with pictures.</p> <p>Suggested Activity 3: Dominoes with pictures.</p> <p>Suggested Activity 4: Duplicate deck of picture cards.</p>   | <p>Lottos and Dominoes.<br/>Form puzzles.</p>  |
| <p>III. Behavioral Goal: Ability to match like pictures making fine discriminations of shape, size and configuration.</p> <p>Suggested Activity 1: Stencils with rows of shapes</p> <p>Suggested Activity 2: Match shape to picture of shape and shape to form.</p> <p>Suggested Activity 3: Arrange graduated cylinders according to size.</p> <p>Suggested Activity 4: Discriminate likes and differences in size and shape when forms are presented graphically.</p> | <p>GRVP SET 1<br/>(32 pages)<br/>In Material Kit</p> <p>GRVP SET 2<br/>(14 sheets)</p> |
| <p>IV. Behavioral Goal: Ability to recognize likes and differences in shape and size (non-pictorial).</p>   | <p></p>  |
| <p>V. Behavioral Goal: Ability to discriminate left-right; up and down.</p> <p>A. In relationship to his own body.</p> <p>Suggested Activity 1: Simon Says - with emphasis on left hand - right - up and down. After children</p>   | <p></p>  |

GENERAL READINESS VISUAL PERCEPTION (Continued)

		Code
V. (Continued)	succeed with teacher as a model, teacher uses only voice command.	
	Level 1: Child moves left or right hand-foot on command.	
	Level 2: Child puts left hand on right ear, right hand on left shoulder, etc.	
	B. As he moves into space: makes left-right turns in march formation.	
VI. Behavioral Goal:	Ability to follow simple map involving up to two left and/or right turns.	Map Set in Kit
Suggested Activity:	Pirate March - Children follow map.	TM GRVP 1
VII. Behavioral Goal:	Ability to discriminate left from right and up from down in a series of patterns and designs.	
Suggested Activity 1:	Stenciled sheets requiring matching.	GRAP KIT 3 1 - 8
Suggested Activity 2:	Frostig sheets requiring up-down and left-right orientation and mirror image projections.	GRAP KIT (5 - 14 sheets)
Suggested Activity 3:	Positional Card Sets (Philograph)	In Material Kit
VIII. Behavioral Goal:	Demonstrates comprehension of 3-dimensional spatial relationships by reproducing a pattern.	
Suggested Activity 1:	Reproduces block construction with 6-10 blocks.	GRVP TM 2
Suggested Activity 2:	Copies design with rubber band form board.	TM 3
Suggested Activity 3:	Copies peg board design.	TM 4



## GENERAL READINESS VISUAL PERCEPTION (Continued)

	Code
XIII. Behavioral Goal: Demonstrates ability to recall visual detail.	
Suggested Activity 1: Guess-A-Child Game: Group is asked to close their eyes. Teacher says, "I am thinking of a child wearing a red-striped dress with a ribbon in her hair." Children point to the child.	TM 8
Suggested Activity 2: Teacher shows poster to group. Turns poster around. "I am thinking of something round and red." Children guess the detail in the poster to which the teacher is referring.	TM 9
XIV. Behavioral Goal: Reproduces a visual sequence with up to six cards.	
Suggested Activity: Memory Game: Using matching sets of pictures and designs, cards are placed in a row and turned over. Child must put matching set in same order.	TM 10
XV. Behavioral Goal: Demonstrates ability to coordinate eye-hand movement in paper-pencil task.	
Suggested Activity 1: Trace around shape or inside inset and fills in with crayon using up-down stroke.	
Suggested Activity 2: Eye-hand coordination stencils.	GRVP 8 (20 sheets)

## GENERAL READINESS VISUAL PERCEPTION (Continued)

	Code
IX. Behavioral Goal: Demonstrates comprehension of spatial relationships presented two-dimensionally.	
Suggested Activity 1: Picture puzzles up to 23 pieces.	Puzzles
Suggested Activity 2: Frostig spatial relationship stencils.	GRVP Set 4.
X. Behavioral Goal: Identifies shapes and figures despite slight variations in form.	
Suggested Activity 1: Find-A-Shape Game: Played with 3 children. Each child is given a "shape" to search for. The first child to find four of his shapes and put them in his basket wins the game. (Use cylinders, spheres, cubes.)	TM 5
Suggested Activity 2: Frostig perceptual constancy stencils.	GRVP Set 6 (7 sheets)
XI. Behavioral Goal: Identifies imbedded figure or shape despite the interference of background noise.	
Suggested Activity 1: Count-A-Shape Game: Children are divided into teams. Each team tries to locate circles, rectangles, triangles in a portion of the room.	TM 6
Suggested Activity 2: Frostig Figure Ground Perception Stencils.	GRVP Set 7
XII. Behavioral Goal: Demonstrates ability to recall up to twelve objects presented visually.	
Suggested Activity: Tray Game: Several objects are placed on a tray. Tray is removed. Child must list objects. Variation: Teacher removes one object. Children tell which object has been removed.	TM 7

GENERAL READINESS LANGUAGE

	Code
<p>I. Behavioral Goal: Demonstrates listening ability by attending to a story.</p> <p>Suggested Activity 1: Teacher reads story.</p> <p>Suggested Activity 2: Story is presented on a record.</p>	<p>Story Book.</p> <p>Story Record.</p>
<p>II. Behavioral Goal: Distinguishes between sentence and sentence fragment, and produces a complete sentence.</p> <p>Suggested Activity 1: Gotkin Language Matrix - Series 1.</p> <p>Suggested Activity 2: Taped activity requiring discrimination of complete sentence and sentence fragment.</p>	<p>Gotkin Matrix, Units 1 and 2</p> <p>GRL Tape #1</p>
<p>III. Behavioral Goal: Describes event in front of group expressing a complete idea.</p> <p>Suggested Activity 1: Show and Tell Period.</p> <p>Suggested Activity 2: Description of Class Activity.</p>	
<p>IV. Behavioral Goal: Uses pronouns correctly in a sentence (nominative, objective, and possessive; singular and plural).</p> <p>Suggested Activity: "Door to Door" Language Routine:          "Who is there? It is I.          Who are you? I am a fireman.          What do you do? I put out fires. Whose fire do you put out? I put out your fires."          "Come in."</p>	<p>Collection of hats representing different occupations.          TM #1</p>
<p>V. Behavioral Goal: Uses "not" construction correctly in oral speech.</p> <p>Suggested Activity: "Not" Routine - Each child looks in the containers, selects an item and says, "This is a pebble. This is not a shell," or "Look, this is an animal. This is not a flower."</p>	<p>Plastic containers with 2 types of items in each container.          GRL TM (2)</p>

GENERAL READINESS LANGUAGE (Continued)

	Code
<p>VI. Behavioral Goal: Comprehends significance of tense and uses tense appropriately.</p> <p>Suggested Activity: Child is given three pictures to arrange at a time on flannel strip, red, white, and blue. Teacher or tape: "Arrange these pictures in order. Put the one that shows what happened first on the red, what happens next on white, and what happens last on the blue."          "Sue washed her dog.          Sue will hang up the clothes.          Sue is washing the dishes."          If child is correct the backs of the cards match the strips.</p> <p>Suggested Activity 2: "Quick Quick Quick. We want a trick." Children chant above refrain, one child stands in center of circle. First he announces, "I will do a somersault." Then, "I am doing a somersault." Finally, "Ladies and gentlemen, I did a somersault."</p>	<p>Gotkin Matrix Unit #9.</p> <p>GRL TAPE (2)</p> <p>Cards and Mats in Material Kit</p> <p>GRL TM (3)</p>
<p>VII. Behavioral Goal: Demonstrates comprehension of words of relationship. (Over, under, above, in, out, beside, between, behind.)</p> <p>Suggested Activity 1: Gotkin Matrix activities.</p> <p>2: Mr. Detective Game:          Preparations: Teacher places red pegs beside several items in the room. Blue pegs - underneath several items.          Teacher gives an assignment to each detective. She hands the detective one peg and tells him to find the second peg.          If he has a red peg she sends him in search of the peg that is beside the wastepaper basket. At the end of the hunt each child should have a pair of matching pegs. (Extra pegs</p>	<p>Gotkin Matrix 8</p> <p>Colored pegs</p> <p>GRL TM (4)</p>



GENERAL READINESS LANGUAGE (Continued)

	Code
<p>VII. Behavioral Goal (continued)</p> <p style="padding-left: 40px;">should be left in each place in case one child takes the wrong peg.)</p> <p style="padding-left: 40px;">Level 2: Add "between."</p> <p>Suggested Activity 2: Words of Relationship Stencils.</p>	<p>GRL Kit 1 Booklet</p>
<p>VIII. Behavioral Goal: Produces four basic sentence types at will.</p> <p>Suggested Activity: "Say Something Game"</p> <p style="padding-left: 40px;">Each child selects an object and a card. The card will stand for a basic sentence type. The child produces a sentence about the object he has picked up, using the appropriate sentence type.</p>	<p>GRL TM (5)</p> <p>Four sentence- type pictures. Assorted objects.</p>
<p>IX. Behavioral Goal: Changes sentence from active to passive construction.</p> <p>Suggested Activity: Each child selects an object. What Are You Doing?</p> <p style="padding-left: 40px;">Level 1: Child describes what he is doing with the object, e.g. "I am petting the dog." Group echoes, "The dog is being petted."</p> <p style="padding-left: 40px;">Level 2: Circle Talk: Child 1: "I am spinning a top." Child 2: "The top is being spun. I am ringing a bell," etc.</p>	<p>TM (5)</p> <p>Box of objects</p>
<p>X. Behavioral Goal: Develops and names categories.</p> <p>Suggested Activity: Mystery Sort Game.</p> <p style="padding-left: 40px;">Children are asked to sort the objects and describe the basis of sorting.</p>	<p>Gotkin Matrix Units 6 &amp; 8</p> <p>Mystery boxes, (plastic margarine containers.)</p>
<p>XI. Behavioral Goal: Demonstrates ability to produce paradigms.</p> <p>Suggested Activity: Silly-Sentence Game.</p> <p style="padding-left: 40px;">Teacher says a sentence. Each child substitutes one word. Next child repeats sentence with substitution, and substitution of another word is used., eg.,</p>	<p>GRL TM (8)</p>

GENERAL READINESS LANGUAGE (Continued)

XI. (Continued)

I ate a big banana.  
 I ate a big gorilla.  
 I kissed a big gorilla.  
 I kissed an ugly gorilla.

XII. Behavioral Goal: Demonstrates ability to expand a sentence.

Suggested Activity: Same Some More:

Teacher begins, "I bought a doll." Next child says, "I bought a big doll." Third child says, "Mother and I bought a big doll." Next child, "Mother and I bought a big doll yesterday," etc. (Whenever a child cannot expand or remember previous expansions, the round begins again.)

Code

GRL TM (9)

AUDITORY ALPHABET PERCEPTION PROGRAM: "AAP"

Code

- |   |  |
|---|--|
| <p>I. Behavioral Goal: Discriminate between likes and differences in words:</p> <p>(a) When teacher presents words orally.</p> <p>(b) When words are presented on tape.</p>   | <p>T.M. Activity 1</p> <p>AAP Tape 1</p>   |
| <p>II. Behavioral Goal: Identifies words that begin with the same initial sound (except x, y and z).</p> <p>(a) When words are presented orally.</p> <p>    Activity A: Teacher presents pairs of words. Children clap when pairs begin with the same beginning sound.</p> <p>    Activity B: Teacher reads alliteration line. Children raise their hands every time they hear the key initial sound repeated.</p> <p>    Activity C: Tape presentation of paired words. Child uses listening board for response.</p> <p>(b) When words are presented pictorially:</p> <p>    Activity A: Pick-a-Poster. Children place picture cards in envelopes on poster so that beginning sounds match. Begin with 2 posters and increase to 20 as children learn to recognize more beginning sounds.</p> <p>    Activity B: Sort-a-Sound: Children sort deck of cards putting all pictures together that begin with the same beginning sound.</p> <p>    Activity C: Sounding Wheel: Child matches card to picture on wheel according to beginning sound.</p> <p>    Activity D: Sound-Lotto.</p> <p>    Activity E: Given a series of pictures with the same beginning sounds</p> <p>    Activity F: Completes Sound Puzzle.</p> | <p>T.M. Activity 2</p><br><p>T.M. Activity 3</p><br><p>AAP Tape 2</p><br><br><br><p>Game 5</p><br><p>Game 6 -<br/>Consonant pictures</p><br><p>Game 7</p> <p>Game 8</p> <p>AAP Sets 1-3</p> <p>Booklet</p> <p>Carnival of Beginning Sounds</p> |
| <p>✓ III. Behavioral Goal: Identifies words that end with the same final sound.</p> <p>(a) When presented orally.</p> <p>    Suggested Activity 1: Teacher names two objects. Children clap if the objects end with the same final sound.</p> <p>    Suggested Activity 2: Final Sound Tape.</p>  | <br><br><br><br><br><br><br><br><p>T.M. Activity 4</p> <p>AAP Tape 3</p>   |

AUDITORY ALPHABET PERCEPTION PROGRAM (Continued)

	Code
III. Behavioral Goal (continued)	
(b) When presented pictorially.	
Suggested Activity 1: Sound-a-Wheel with final sounds.	Game 7B
Suggested Activity 2: Alpha Sort-a-Sound.	Game 6B
Suggested Activity 3: Final Sound Booklet.	AAP Booklet Set 5
IV. Behavioral Goal: Identifies five short vowel sounds produced in isolation.	
Suggested Activity 1: Teacher reads short vowel poem. Child identifies short vowel animal by the sound he makes.	
Octopus - ŌŌ. Inchworm - ĪĪ.	
Alligator - ÄÄ. Elephant - ĒĒ.	
Uppity Bird - ŪŪ.	TM Activity 5
Suggested Activity 2: Tape presentation of animal sounds.	AAP Tape 14
V. Behavioral Goal: Produces short vowel sound so that it can be identified.	
Activity 1: Noah's Ark Game	TM Activity 6
Activity 2: Mighty Mouse Game.	TM Activity 7
VI. Behavioral Goal: Matches like middle word sounds.	
(a) When sounds are presented orally.	
Activity 1: Teacher reads pairs of words. Children identify like and different middle sounds.	
Activity 2: Tape presentation	TM Activity 8
	AAP Tape 15
(b) When presented pictorially.	
Activity 1: Sort-a-Sound.	Game 6C
Activity 2: Sound Lotto	Game 8
Activity 3: Vowel picture sort.	Vowel pictures in material kit
VII. Behavioral Goal: Identifies pairs of rhyming words.	
Activity 1: Sort-a-Rhyme.	Game 12
Activity 2: Magic Spinning Wheel.	Game 13
Activity 3: Find the Rhyming Picture	AAP Booklet
Activity 4: Matches rhyming objects to rhyming pictures.	Rhyming object kit
VIII. Behavioral Goal: Produces rhyme spontaneously	
Activity 1: Produces a word to complete a rhyme	TM Activity 9
Activity 2: Selects object and produces a rhyming word.	TM Activity 10



AUDITORY ALPHABET PERCEPTION PROGRAM (Continued)

		Code
IX. Behavioral Goal:	Blends and separates sounds within a word.	
	Activity 1: Using sound poster, teacher points to a word. "This is an at." Class responds, "It's a bat."	TM Activity 11
	Activity 2: Tape presentation of "broken words" for blending.	AAP Tape 6
X. Behavioral Goal:	Repeats sequence of letters by rote	Consonant Charts
	Activity 1: Teacher goes around circle asking each child to repeat five letters presented in random order.	
	Activity 2: Learns ABC's.	
XI. Behavioral Goal:	Recognized discrete words.	
	Activity 1: Teacher reads sentence. Child places a chip on the table to represent each single word he hears.	TM Activity 12

AUDITORY-VISUAL ALPHABET PERCEPTION PROGRAM

		Code
I.	Behavioral Goal: Matches single lower case letters according to their shape.	
A.	Using 3-dimensional letters. Suggested Activity: Sort plastic letters	Plastic Letter Set
B.	When presented graphically:	
	Activity 1: Sort-a-Deck game. Sort letters	Mystery Pig Game 1A Game 2A
	Activity 2: Letter Dominoes	Game 3A Game 4A
	Activity 3: Alpha-Bingo. Bingo with letters.	AVAP Set 1 Game 15
	Activity 4: Lazy Pup	
	Activity 5: Stencil Sheet	
	Activity 6: Pick-a-Puzzle.	
II.	Behavioral Goal: Orients single lower case letters spatially.	
	Activity 1: Places letters in correct position on letter form board.	Letter Case
	Activity 2: Completes alphabet puzzle.	Alphabet Victory Puzzle
	Activity 3: Matches Plastic Letters to Outline.	Plastic letters; Outline Board
	Activity 4: Find-and-Fit Puzzles	Find-Fit Puzzles
III.	Behavioral Goal: (a) Demonstrates retention of visual image of letter by matching letter after time lapse.	
	Activity: Children complete letter outline in left right order by retrieving one letter at a time.	Plastic letters; Outline Board
III.	Behavioral Goal; (b) Matches Short Words	
	Activity 1: Magnetic Board Matching-sentence game.	Instructo Board Sentence Builder
	Activity 2: Dominoes with words	2C
	Activity 3: Deck of cards with words.	1C
IV.	Behavioral Goal: Identifies words that begin with the same initial sound.	
A.	When words are presented orally:	
	Activity 1: Teacher presents pair of words. Children clap when pairs begin with the same beginning sound.	TM (1)
	Activity 2: Teacher reads alliteration line. Children repeat only those words that begin with the key initial sound.	TM (2)

AUDITORY-VISUAL ALPHABET PERCEPTION PROGRAM (Continued)

		Code
IV. (Continued)		
Activity 3:	Taped presentation of sound pairs with listening board.	AVAP
B. When presented pictorially:		
Activity 1:	Pick-a-Poster. Children place picture cards in envelopes on poster so that beginning sounds match. Begin with 2 posters and increase to 20 as children learn to recognize more beginning sounds.	Game 5
Activity 2:	Sort-a-Sound. Children sort deck of cards putting all pictures together that begin with the same beginning sound. (Same activity with peg-board beginning sound set.)	Game 6 Peg Board Consonant Sounds.
Activity 3:	Sounding Wheel. Child matches card to picture on wheel according to initial sound.	Game 7
Activity 4:	Sound-Lotto.	Game 8
Activity 5:	Complete beginning sound puzzle.	Carnival of sounds
V. Behavioral Goal:	Associates letter form to letter name.	
Suggested Activity 1:	Flash-card presentation of letters. Children hold the letters they name, trying to collect as many letters as possible.	Set of letter flash cards
Suggested Activity 2:	Alpha-A-Bingo. Bingo with letters. Caller announces letter name.	Game 3-A
Suggested Activity 3:	Listens to letter names on tape and lines up letters in appropriate order on letter board.	AVAP Tape 2
VI. Behavioral Goal:	Matches consonant letter form to letter sound.	
Suggested Activity 1:	Sort-a-Sound Game with single letters included in deck.	TM 3 Game 6B
Suggested Activity 2:	Victory puzzle placing letters on pictures	TM 4 Victory Alpha-bet Puzzle.
Suggested Activity 3:	Fishing Fun Game. Cabinet Game	Game 14C 27
Suggested Activity 4:	Pencil and paper activity matching letter form to letter sound.	AVAP Booklet Kit 1 and 3

AUDITORY-VISUAL ALPHABET PERCEPTION PROGRAM (Continued)

	Code
VI. (Continued)	
Suggested Activity 5: Complete picture and sound puzzle.	Philograph Puzzle Set
Suggested Activity 6: Teach Key.	Teach Key Set.
VII. Behavioral Goal: Produces letter form.	
Level 1: With partial outline.	AVAP 23
Level 2: With letter model	AVAP 4
Level 3: With tracing.	Alphabet Insets.
VIII. Behavioral Goal: Matches capital and small letter form.	
Suggested Activity 1: Places letters in letter form board.	Letter Form Board
Suggested Activity 2: Alpha-Bingo with large and small letters.	Game 1b
Suggested Activity 3: Light-up Letter Board	16
Suggested Activity 4: Magic Spinning Wheel	Game 13
Suggested Activity 5: Pencil and Paper Activity	AVAP Booklet Set 8
IX. Behavioral Goal: Identifies words with like final sounds.	
A. When presented orally:	
Suggested Activity: Teacher names two objects. Children clap if the objects have the same final sound. Final Sound Tape.	TM 5 AVAP Tape 3*
B. When presented pictorially:	
Activity 1: Sound Wheel with Final Consonants	Game 7B
Activity 2: Sort-a-Sound.	Game 6B
Activity 3: Final Sound Booklet	AVAP Booklet Set 2
X. Behavioral Goal: Identifies five short vowel sounds produced in isolation and associates sound with letter form.	
Activity 1: Short vowel activity poem: Learns names, sounds and letter symbol of "short vowel animals."	TM 6
Activity 2: Identifies short vowel sounds in taped presentation.	AVAP 4
XI. Behavioral Goal: Produces short-vowel sound so that it can be identified.	
Activity 1: Noah's Ark Game.	TM 7



AUDITORY-VISUAL ALPHABET PERCEPTION PROGRAM (Continued)

	Code
XII. Behavioral Goal: Matches like middle word sounds:	
A. When sounds are presented orally.	
Activity 1: Teacher reads pair of words.	
Children identify like and different middle sounds.	
Activity 2: Mighty Mouse Game	TM 8
Activity 3: Tape presentation.	AAP Tape 15
B. When sounds are presented pictorially.	
Activity 1: Vowel sort set.	
Activity 2: Vowel pictures.	
XIII. Behavioral Goal: Inserts appropriate short vowel in three-letter words.	
Suggested Activity 1: Draws proper vowel according to outline guide.	AVAP Booklet 5
Suggested Activity 2: Inserts appropriate letter between consonant on Spell-a-Word Board.	
Suggested Activity 3: Teach Key	Game 26 Teach Key
XIV. Behavioral Goal: Blends and separates sounds within a word.	
Activity 1: Using sound poster, teacher points to a word. "This is a at." Class responds, "It's a bat."	TM 9
Activity 2: Tape presentation of "broken words" for blending.	AAP Tape 6
Activity 3: Blends sound to complete a word puzzle.	Sort & Sound Set
XV. Behavioral Goal: Matches word with word picture.	
Suggested Activity 1: Guess-a-Face Puzzle.	Game 19.
Suggested Activity 2: Linguistic Puzzle.	Game 20
Suggested Activity 3: Build-a-Block Puzzle.	Game 21
Suggested Activity 4: Word and Picture Stencil.	AVAP Set 6
Suggested Activity 5: "I Can Find It" Lotto.	"I Can Find It" Lotto Game

LANGUAGE PROGRAM FOR VISUAL ALPHABET, AUDITORY ALPHABET, AND  
AUDITORY VISUAL ALPHABET PROGRAMS

	Code
I. Behavioral Goal: Demonstrates listening ability by attending to story.	
Suggested Activity - AAP - Emphasis on aliteration poems and stories stressing alphabet sounds.	AAP TM (1)
Suggested Activity - VAP - Story Time with major emphasis on visual presentation of letters while listening to alphabet stories.	VAP TM (2); Alphabet Books
Suggested Activity - AVAP Modification -- While listening to alphabet stories, children hold alphabet cards, matching their letters to letters in the alphabet book.	Alphabet Cards
II. Behavioral Goal: Discriminates between sentence and sentence fragment and produces complete sentences.	
Suggested Activity:	
1. Gotkin Matrix routines: with VAP and AVAP use magnetic letters instead of shapes.	Gotkin Matrix; Magnetic letters
2. Tape presentation of sentence phrases and sentence fragments.	Tape #1.
III. Behavioral Goal: Describes event in front of group, expressing complete idea and demonstrating expanding vocabulary.	
Suggested Activity - AAP - Use consonant posters as the basis for stories.	
Suggested Activity - VAP - Each child describes a letter that the group must identify.	
Suggested Activity - AVAP - Show-and-tell period with teacher, <u>writing down</u> each child's contribution.	Chart paper
IV. Behavioral Goal: Uses pronouns correctly in a sentence.	
Suggested Activity for AAP and AVAP:	
1) Door-to-Door Language Routine:	
Knock - knock. Who is there?	
It is I - Who are you?	
I am an A.	
What are you for?	
I am for Apple.	
Whose Apple?	
Your Apple.	
Come in.	
See TM for routine.	Alphabet Cards with Pictures
	Representative Hats TM (3)

LANGUAGE PROGRAM FOR VISUAL ALPHABET, AUDITORY ALPHABET, AND  
AUDITORY VISUAL ALPHABET PROGRAM (Continued)

	Code
<p>V. Behavioral Goal: Uses "not" construction correctly in oral speech.</p> <p>Suggested Activity - AAP - Language Routine: This is a butterfly. It belongs with ball. It does not belong with apple.</p> <p>Suggested Activity for VAP and AVAP - This is an A. This is not a B.</p>	<p>Consonant posters. Picture cards Plastic containers with 2 letters in container.</p>
<p>VI. Behavioral Goal: Comprehends significance of tense and uses tense appropriately.</p> <p>Suggested Activity 1: Child is given three pictures to arrange at a time on flannel strip, red, white and blue. Teacher or tape: Arrange these pictures in order. Put the one that shows what happened first on the red, what happened next on white, and what happens last on the blue. "Sue washed her dog. Sue will hang up the clothes. Sue is washing the dishes." If child is correct, the backs of the cards match the strips.</p> <p>Suggested Activity 2: "Quick - quick - quick. We want a trick." Children chant above refrain. One child stands in center of circle. First he announces, "I will do a somersault." Then, "I am doing a somersault." Finally, "ladies and gentlemen, I did a somersault." Modification for VAP &amp; AVAP "I will be like an S-"</p>	<p>Tape #2</p> <p>TM 4</p>
<p>VII. Behavioral Goal: Demonstrates comprehension of words of relationship (over, under, in, out, between, beside, behind).</p> <p>Suggested Activity - VAP &amp; AVAP - Mr. Detective Game with letters. Teacher puts A's beside certain items in the room, B's underneath, C's on top. Each child is given one letter and given directions as to where to find a second letter. If relationship-words are understood, each child finishes with a pair of matching letters.</p>	<p>TM 5</p>

LANGUAGE PROGRAM FOR VISUAL ALPHABET, AUDITORY ALPHABET, AND  
AUDITORY VISUAL ALPHABET PROGRAM (Continued)

	Code
VII. (Continued)	
Suggested Activity - AAP - Mr. Detective Game with shapes.	TM (8)
VIII. Behavioral Goal: Produces four basic sentence types at will.	
Suggested Activity: Game: "Say-Something Game."	4 Sentence Cards
VAP & AVAP: Each child selects a letter and a card representing a sentence type. Child must produce a sentence about the letter, a question, a statement, a command, or an exclamation in accordance with his sentence-type card.	AVAP - VAP
AAP : Child selects picture rather than letter. Sentence must be about beginning sound.	
IX. Behavioral Goal: Changes sentence from active to passive construction.	
Suggested Activity for VAP, AVAP - What are you doing Circle Game.	
Child: I am holding an A.	
Group echoes: The A is being held.	
2nd Child: I am spinning a "B."	
Group echoes: The B is being spun.	
Suggested Activity for AAP - Same game using objects instead of letters.	
X. Behavioral Goal: Develops and names categories.	
Suggested Activities: AAP & AVAP - Children are given deck of picture cards and are asked to sort cards according to a sound characteristic (could be beginning, middle or final sound; one syllable vs. two syllables). Each child must describe the basis of sorting.	Deck of Picture Cards
Suggested Activity for VAP & AVAP Program: Children given a deck of letter & word cards. Children are asked to sort the cards according to a shape characteristic.	
XI. Behavioral Goal: Demonstrates ability to produce paradigms.	
Suggested Activity: Silly-Sentence Game.	
Teacher says a sentence. Each	



LANGUAGE PROGRAM FOR VISUAL ALPHABET, AUDITORY ALPHABET, AND  
AUDITORY VISUAL ALPHABET PROGRAM (Continued)

XI. (Continued)

child substitutes one word. Next child repeats sentence with substitution, and substitutes another word, e.g.,

I ate a big banana.

I ate a big gorilla.

I kissed a big gorilla.

I kissed an ugly gorilla.

Code

TM

XII. Behavioral Goal: Demonstrates ability to expand a sentence using alphabet train.

I bought an apple.

I bought an apple and a book, etc.

Alphabet Train

AAP TM (8)

ADAPTATIONS OF GENERAL READINESS CREATIVITY PROGRAM  
FOR ALPHABET PROGRAM

---

Code

## ART:

Behavioral Goal: Child achieves diversity, originality, form, balance and communicability in a variety of media.

Suggested Activities for VAP and AVAP:

Use letters in arts and craft project as much as possible. Make letters out of clay, wool, strips of paper, stencils, blocks, pipe cleaners. Develop craft projects with alphabet noodles, alphabet sewing cards, felt letters, alphabet beads, screen painting.

Suggested Activities for AAP and AVAP:

Read aliteration poem or discuss initial sound posters as an introduction to a creative art project.

Ask the children to draw something that the poem or poster made them think about.

Suggested Activities for AVAP only:

Write out the child's explanation of his "creation" on all his art work.

## MUSIC - DANCE - RHYTHM:

Behavioral Goal: Listens to record of song or orchestration with interest.

Behavioral Activities for VAP:

Use any age-appropriate record.

Behavioral Activities for AVAP and AAP:

Stress A B C records.

Behavioral Goal: Clap to song or verse in rhythm.

Suggested Activity for VAP use - any age appropriate song or verse.

Suggested Activity for AAP and AVAP: Clap to alphabet songs (alternating hand-knee clapping). Clap out aliteration line.

TM (1)

Behavioral Goal: Follows direction from record or tape.

Suggested Activities for VAP and AVAP:

Act out Walt Disney alphabet record.

Suggested Activities for AAP and AVAP:

Aliteration songs.

TM (2)

Behavioral Goal: Sings song with group.

Suggested Activity for VAP: Age-appropriate song.

Suggested Activity for AVAP and AAP: Alphabet songs and short-vowel songs.

TM (3)

ADAPTATIONS OF GENERAL READINESS CREATIVITY PROGRAM  
FOR ALPHABET PROGRAM (Continued)

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Code

---

MUSIC - DANCE - RHYTHM: (Continued)

Behavioral Goal: Moves to music.

Suggested Activity for VAP and AVAP:

1. Musical Chairs with Alphabet Sit-Upons.
2. Stepping Stones with Alphabet Sit-Upons.
3. March into letter formations.

TM (4)

TM (5)

Suggested Activity for AAP: March in line to ABC songs.

TM = Teachers Manual

DRAMA:

Behavioral Goal: Pantomime familiar activities or form.

Behavioral Activity for AAP and AVAP: Use beginning sound poster for pantomime inspiration.

Behavioral Activity for VAP: Reproduce a letter with body or fingers. Draw it in the air. Group must identify letter.

Behavioral Goal: Mimics animal sound.

Behavioral Activity for VAP:

"Who's in the barnyard.  
Who's in the barnyard.  
Who's in the barnyard today.  
Who's in the barnyard.  
Who's in the barnyard.  
Who's in the barnyard say."

Child in the center of the circle mimics sound of an animal. If he is identified he joins circle and selects next animal.

Behavioral Activity for AAP and AVAP: Same game except use short vowel animals.

TM (6)

Behavioral Goal: Produces original poem or story ending.

Behavioral Activity for AAP and AVAP: Furnishes final rhyming word or creates alliteration.

TM (7)

Behavioral Activity for VAP: Creates story ending for animated letter story.

TM (8)

APPENDIX B  
TABLE OF SOCIO-ECONOMIC INFORMATION  
FAMILY AND HEALTH HISTORY

Residence	#	Birthplace	#	Occupation of Father	#	Occupation of Mother	#
Hollywood	14	Broward	47	Construction	11	Domestics	15
Hallandale	9	Florida	8	Service	7	Beautician	1
West Hollywood	24	(not Broward) Out of State	5	Farming or Gardening	4	Nurse's Aide	1
Dania	7			Auto Repairs	2	Telephone Operator	1
Davie	6			Army	1		

Last Grade in School	Mother	Father	Siblings	#	Parental Status	#	Health Problems	#	Treatment
2 years in college	-	1	1	7	Child lives with both parents.		(This information is taken from M.D. report)		
Complete high school	3	8	2	17	Child lives with mother only.				
11th grade	2	2	3	4			8 Anemia	60	Iron pills given daily
10th grade	1	1	4	5	Child lives with guardian.				
9th grade	-	1	5	2			2 Systolic murmur	4	Referred to specialist
8th grade	2	-	6	3			Coarse chest rales	3	Referred to specialist
Less than 7th grade	3	-	7	0	No response.		25 Orthopedic problems	3	Referred to specialist
No response	49	47	8	1			Ear problems	2	Referred to specialist
							Eye problems	2	Referred to specialist
							Ketone bodies in urine	2	Referred to specialist
							Hydrocele	1	Referred to specialist
							Umbilical hernia	1	Referred to specialist
							Protruding abdomen	1	Referred to specialist
							Epilepsy	1	Referred to specialist



APPENDIX CPRE-TEST CHECKS

- I. Read instructions and become completely familiar with test prior to administration.
- II. Check-List
  - a. All tests should have child's FULL NAME.
  - b. Pencils should be sharpened and extra pencils available.  
All children should be given markers.
  - c. Chairs and tables should be spaced.
  - d. Stop watch checked for all tests that require timing.
- III. All children should be sent to the bathroom prior to testing.
- IV. Follow instructions exactly. Aide may check to see if child is on the right page, but extreme care should be taken not to give the child any kind of help or hint.

## APPENDIX C -- COPIES OF TESTS AND DIRECTIONS

## DIRECTIONS FOR AUDITORY VISUAL SHIFTING TEST -- AUDITORY COMPONENT.

## I. AUDITORY COMPONENT:

Put your marker under the row of boats. I am going to tap the table. Mark as many boats as you hear taps. Listen. Did you mark just one boat? Good. I tapped the table just one time.

(Teacher checks to see if child has done sample correctly.)

Place your marker under the number of forks. Mark as many forks as you hear taps. (2)

Next place your marker under the number of airplanes. Mark as many airplanes as you hear taps. (2)

Place your marker under the row of balloons. Mark as many balloons as you hear taps. (4)

Place your marker under the row of pencils. Mark as many pencils as you hear taps. (2)

Place your marker under the row of dogs. Mark as many dogs as you hear taps. (3)

Place your marker under the row of books. Mark as many books as you hear taps. (4)

Place your marker under the row of lollipops. Mark as many lollipops as you hear taps. (3)

Place your marker under the row of milk bottles. Mark as many milk bottles as you hear taps. (4)

Place your marker under the row of glasses. Mark as many glasses as you hear taps. (5)

## DIRECTIONS FOR AUDITORY VISUAL SHIFTING TEST -- VISUAL COMPONENT

## I. VISUAL TEST:

Place your marker under the first row of boats.

Mark as many boats as you see dots.

Did you mark one boat? Good. You should mark just one boat because you see just one dot.

(Teacher checks to make sure each child has done sample correctly.)

Place your marker under the number of forks. Mark as many forks as you see dots.

Place marker on the next row of airplanes.

Mark as many airplanes as you see dots.

Next move down to the row of balloons. Mark as many balloons as you see dots.

Remember to mark only as many dots as you see.

Move your marker to the row of pencils. Mark as many pencils as you see dots.

Move your marker to the row of dogs. Mark as many dogs as you see dots.

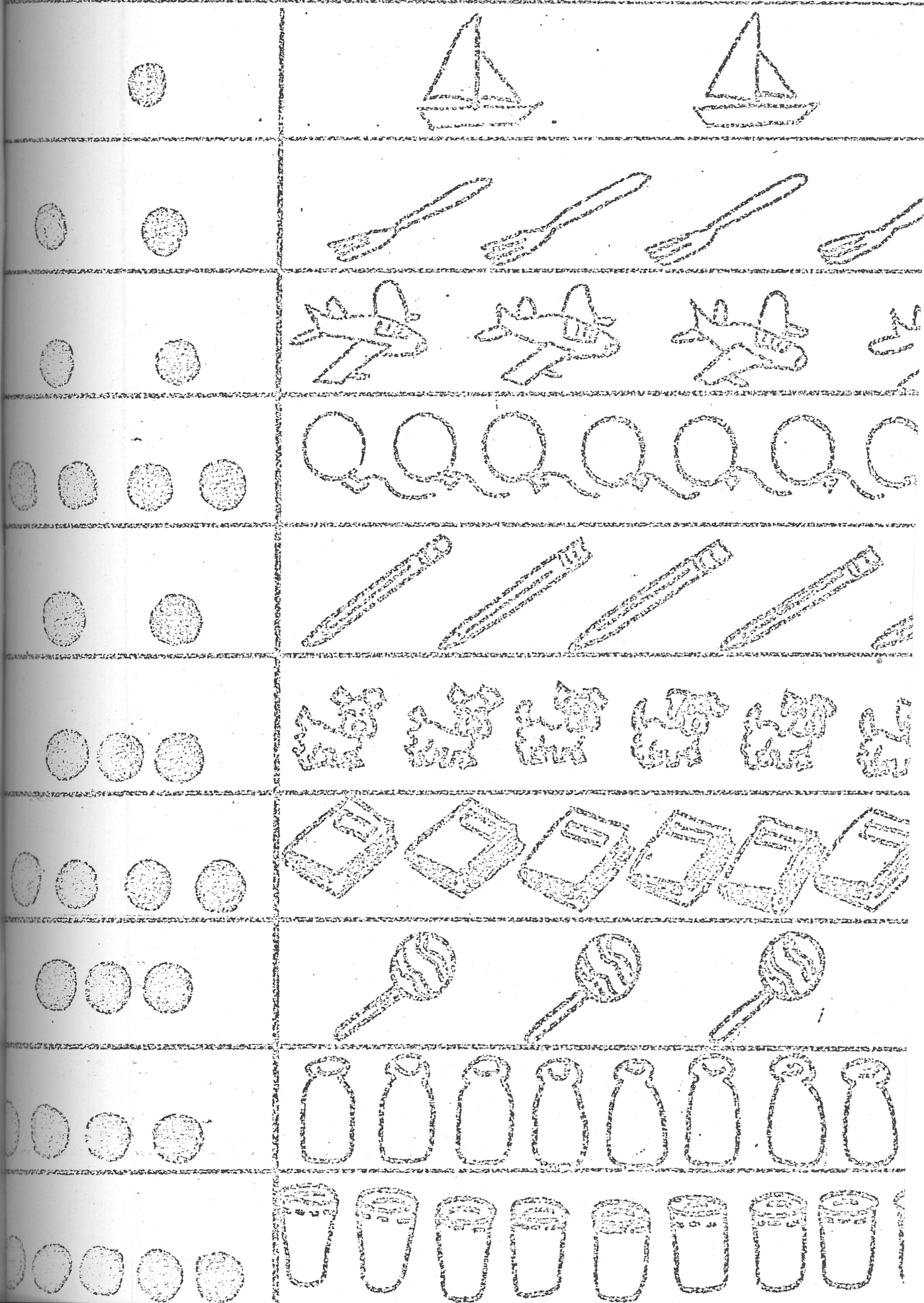
Move your marker to the row of books. Mark as many books as you see dots,

Move your marker to the row of lollipops. Mark as many lollipops as you see dots.

Move your marker to the row of milk bottles. Mark as many milk bottles as you see dots.

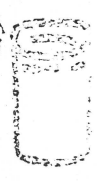
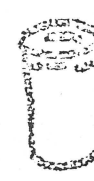
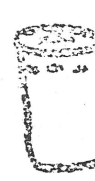
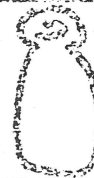
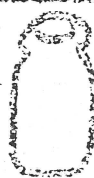
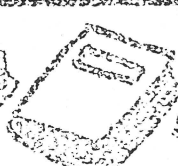
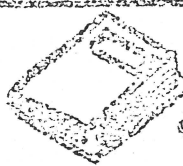
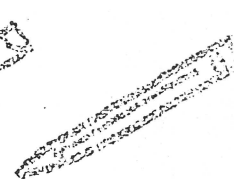
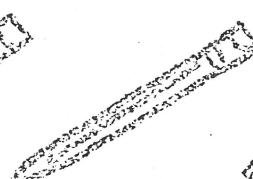
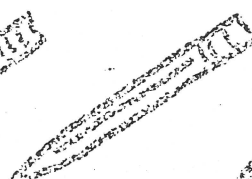
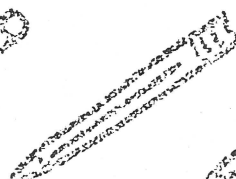
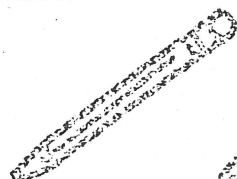
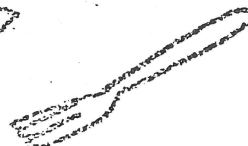
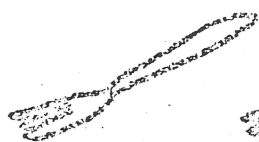
Move your marker to the row of glasses. Mark as many glasses as you see dots.

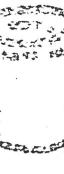
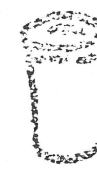
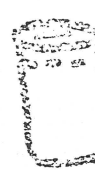
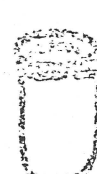
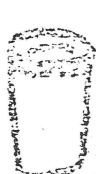
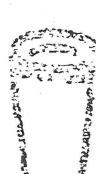
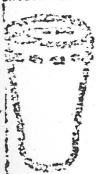
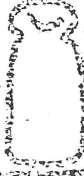
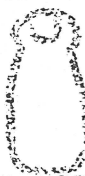
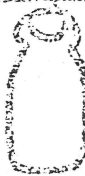
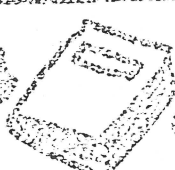
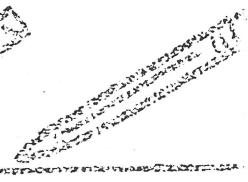
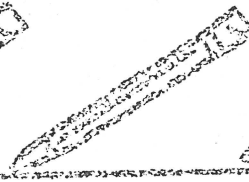
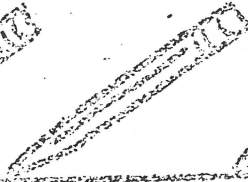
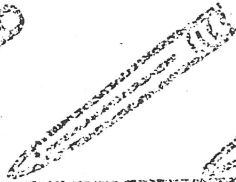
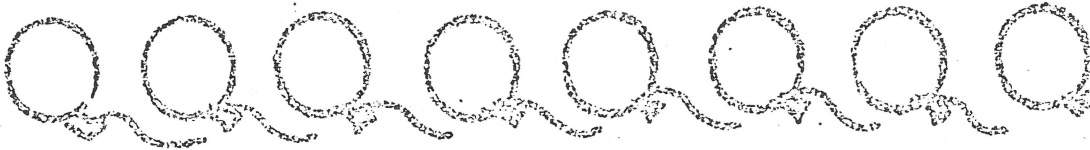
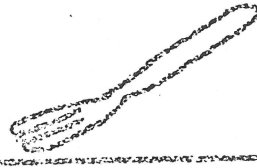
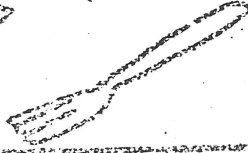
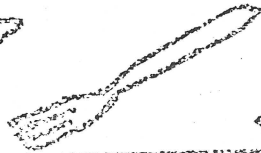
## AUDITORY VISUAL SHIFTING TEST -- VISUAL COMPONENT





## AUDITORY VISUAL SHIFTING TEST -- VISUAL COMPONENT





## LEARNING RATE TEST I

Write on board:

tongue	hair	eyes
walk	fly	swim
hat	cat	rat

- I. Say to pupils: These words are names of things that sound alike -  
 Hat                  Cat                  Rat

Say them after me - hat - cat - rat.

Say them again - hat - cat - rat.

Point to hat - h- (point to h) at (point to at)

This is a h-at - What is it?

That's right - a hat - a h - touch the h at- (touch the at)  
 that I wear on my head. Let us read this word together.

hat - hat

Now we are ready for the second sound alike word. This word is a c  
 (touch c) - at (touch at). It is an animal that says meow - It is a  
 \_\_\_\_\_. Let us read all together - cat - Very good. Now we can read  
 two words - hat - cat. All together Hat - Cat.

Are you ready for the next sound alike word? This word says the name  
 of an animal too. A very small animal. It is a r (touch the r) -at -  
 (touch the at). It is a (pause for group response) rat. Let us say  
 it all together. It is a rat.

Now let us read all the words in the top box.

hat-cat-rat.

Now - nice and loud - hat-cat-rat.

Very good. You are very good readers.

What is this? (point to rat)

And this? (point to cat)

And this? (point to hat)

Now I will show you the same words on cards.

This word is a (pause) cat.

This word is a (pause) rat.

This word is a (pause) hat.

Hold up cat - and rat.

Which one of these is the name of an animal that says meow?

That's right, this is a \_\_\_\_\_ cat.

Hold up cat and hat.

Which word is the name of something you wear on your head?

That's right. This word says "hat."

This is a \_\_\_\_\_ rat. This is a \_\_\_\_\_ hat. This is a \_\_\_\_\_ cat.

Now get your markers ready.

Pick up Learning Sample Box Test.

In the first row Box #1 put a mark on the word that says hat.

In the second row put a mark on the word that says rat.

In the third row put a mark on the word that says cat.

## LEARNING TEST II

Write on board:

six	fix	mix
hand	sand	band
round	clean	heavy

Now we are ready to learn the second row of words. Look up at the blackboard.

Six - fix - mix. Six - fix - mix.

This word says s --- (touch s), ix (touch ix). What does it say?

That's right - six. Can you count to six?

Let us read this word very slowly together - s-ix.

This word says f-ix. What does it say? That's fix when something breaks you have to (point) Fix it.

Now let us read both of our ix words. This word says s-ix - six.

This word says fix - fix. Can you read without me? (Point to fix and six)

Now let us read the last word in the row. "mix" - say it all together.

Mix. When I bake a cake. I m-ix it. What do I do? That's right.

I mix it. Now we know three new words. Let's read them together.

Fix - mix - six. Six - mix - fix.

I have these same words on cards. Now you read the cards. Let's try.

This word says - m-ix. That's right - mix.

This word says \_\_\_\_\_. That's right - six.

This word says \_\_\_\_\_. That's right - fix.

Let's try again --- six ----- mix ----- fix.

You are very good workers.

Now get your markers ready. We will begin with the #2 middle box.

On the top row - Mark m-ix - mix.

On the 2nd row - Mark s-ix - six.

On the 3rd row - Mark f-ix - fix.

Very good. Now we are ready for our last box of words. Look up on the blackboard.

You see three words in the box. Read them after me.

hand -- sand - band.

This word says h-and. Hand.

What does this word say? That's right.

This word says "hand." Hold up your right \_\_\_\_\_ (point to the word).

Good. This word says s-and. Sand. Do you like to play in the s-and. sand?

Now let us read both words. Hand - Sand.

Point to the word that says "hand." Point to the word that says "sand." Now let us look at the last word. The last word says "band." A band plays music. Have you ever heard a band play music? Point to the word that says b-and. Band. Point to the word that says h-and. Hand. Point to the word that says s-and. Sand.

Now let us look at the same words on cards. (Hold up hand and band.) Which word says hand? Good - Hand is in my hand. What does this word say? It says b-and. What does this word say? s-and. What does this word say? h-and. Very good.

Now place your marker on the last square box. #3. Mark the word that says sand.

Mark the word that says band. Move your marker to the 3rd line.

Mark the word that says hand.



## DIRECTIONS FOR THE LEARNING RATE TEST

FIRST DAY

1. Move your marker under the first row.

Mark the word hat - hat.

2. Move your marker down.

Mark the word rat - rat.

3. Move your marker down.

Mark the word cat - cat.

4. Move your marker down.

Mark the word hat - hat.

5. Move your marker down.

Mark the word cat - cat.

6. Move your marker down.

Mark the word rat - rat.

DIRECTIONS FOR THE LEARNING RATE TESTDAY II

1. Put your marker under the first row.  
Mark the word hand - hand.
2. Move your marker down.  
Mark the word fix - fix.
3. Move your marker down.  
Mark the word six - six.
4. Move your marker down.  
Mark the word hand - hand.
5. Move your marker down.  
Mark the word fix - fix.
6. Move your marker down.  
Mark the word band - band.
7. Move your marker down.  
Mark the word sand - sand.
8. Move your marker down.  
Mark the word band - band.
9. Move your marker down.  
Mark the word six - six.
10. Move your marker down.  
Mark the word mix - mix.
11. Move your marker down.  
Mark the word sand - sand.
12. Move your marker down.  
Mark the word mix - mix.

## APPENDIX D

TEACHER 1.

2.

DATE \_\_\_\_\_

Codes: 1=Too little or too low. 2=Somewhat too little or too low. 3.=Appropriate. 4=Somewhat too much or too high.  
5=Too much or too high.

[illegible]

## APPENDIX D

E = excellent.    VG = very good.    G = good.    F = fair.    P = poor.

Fill in the blanks using the following scale:

E-excellent (5), VG-very good (4), G-good (3), F-fair (2) or P-poor (1).

Teacher: \_\_\_\_\_ Date: \_\_\_\_\_

[illegible]

# APPENDIX E

In accordance with the procedure recommended by Ward and Bottenberg, multiple linear regression equations will be developed as follows:

## Test for Homogeneity of Regression:

### MODEL I - Full Model:

$$Y = a_1 X^{(1)} + a_2 X^{(2)} + a_3 X^{(3)} + a_4 X^{(4)} + r.$$

where  $Y$  = criterion vector of dimension  $n$ .

$X^{(1)}$  = 1 if the subject is in GRP - 0 if in AVAP.

$X^{(2)}$  = 1 if the subject is in AVAP - 0 if in GRP.

$Z$  = Pre-test scores associated with each subject in vector  $Y$ .

$$X^{(3)} = X^{(1)} \times Z.$$

$$X^{(4)} = X^{(2)} \times Z.$$

$r$  = residual vector

$a_1, a_2, a_3, a_4$  are least square weights associated with  $X^{(1)}, X^{(2)}, X^{(3)}, X^{(4)}$ .

### MODEL II - Restricted Model:

$$Y = a_1 X^{(1)} + a_2 X^{(2)} + a_3 X^{(3)} + a_4 X^{(4)} + e.$$

where  $e$  = the residual vector for the restricted model.

As  $X^{(3)} + X^{(4)} = Z$  = the pre-test vector, the restricted model may be written as:

$$Y = a_1 X^{(1)} + a_2 X^{(2)} + a_3 Z + e.$$

By comparing the amount of error associated with the full model:

$$Q^1 = (r_1)^2 + (r_2)^2 + \dots + (r_n)^2.$$

with the amount of error associated with the restricted model an  $F$  ratio can be computed using the following equation:



$$F = \frac{(Q_2 - Q_1) / (df)1}{Q_1 / (df)2}$$

where (df)1 = the difference between the number of independent parameters in the full model and the restricted model.

(df)2 = the difference between the dimension of a predictor variable and the number of independent parameters in the full model.

If the F value associated with this model is not significant we cannot reject the assumption that  $a_3 = a_4$ , and homogeneity of regression is established.

#### TEST FOR MAIN EFFECTS

With homogeneity of regression established, we can then ask the question, are GRP and AVAP equally effective for subjects with pre-test scores within the observed range? The equation for the full model in this instance is identical with the equation used in the restricted model testing homogeneity of regression.

$$\text{Full Model: } Y = a_1 X^{(1)} + a_2 X^{(2)} + a_3 Z + r.$$

In the restricted model where we want to eliminate the addition to the predictive power of the equation made by knowledge of treatment group placement, the unit vector is substituted for  $X^1$  and  $X^2$ .

$$\text{Restricted Model: } Y = a_1^U + a_3 Z + e.$$

Comparison of the error sum of squares for the full model and the restricted model yields an F value and an associated probability value.

## APPENDIX F - SAMPLE PAGE FROM TEACHER'S MANUAL

TM CREATIVITY 1

## TM 1

In planning arts and crafts projects teachers concern must be with the process rather than the product.

1. Projects that take a lot of teacher planning time are of little value.
2. Arts and crafts projects should always be kept simple enough so that teacher help is never required. One of the very few hard and fast rules in a pre-school is that teachers should not touch a child's work.
3. Pasting and cutting activities provide opportunities for developing eye-hand coordination, and small muscle control and should be included in the art program. Most five year olds are able to spread paste smoothly and coordinate both hands in cutting so that they can cut around corners and curves.
4. A good comment to make when viewing a child's artistic effort is, That's interesting. Would you like to talk about it? Avoid asking what it is or assuming that you know. The pretty house you congratulate a child for could turn out to be a Martian water tank, or the back of a turtle.

## TM 2

In assessing a child's ability to reproduce a human figure, observe the following points:

- Is the figure complete?
- Are the body parts correctly positioned?
- Is the figure proportional?
- Is the figure straight?
- How much detail has the child put into the rendering?

## TM 3

Criteria for assessing achievement in painting:

1. Covers total page.
2. Produces form.
3. Uses more than one color.
4. Produces variety of color affects.
5. Produces variety of brush strokes.
6. Produces effect of movement and mood.
7. Talks about painting.

APPENDIX F - SAMPLE PAGE FROM TEACHER'S MANUAL  
(Continued)

General Readiness - Language (continued)

TM 3 Quick-quick-quick

Children sit in a circle. One child is selected as the clown and stands in the center of the circle. The audience chants, "Quick - quick - quick. We want a trick!"

The clown then announces:

"I will do a somersault.

I am doing a somersault. (Child does somersault.)

I did a somersault."

In this routine the children may tend to copy each other and all do the same trick. The teacher can suggest alternatives such as touch your toes, hop on one foot, walk like a duck, do a push-up, do a deep-knee bend, etc.

TM 4 Mr. Detective Game.

Before the hunt begins demonstrate the relationship words to the group. Put a book on the table, a red block under it, a green block on top of it, and a yellow block beside it. Ask the children what color block is "beside" the book, etc.

When the children seem to comprehend the relationship words, the peg hunt can begin. Each child is given a) a peg, b) a clue to its location. The teacher should keep a record of where she has hidden the pegs, being careful to have one color peg under objects, a different color beside, and a third color on top of the object. Children are instructed to cross the room, search "on top of" the book, and see if they can find a peg. If the children follow the directions correctly they should end up with matching pegs.

(When children have learned on top of, under, and beside, introduce inside, between, in front of, and behind.)

TM 5 Say-Something Game.

Props: 4 cards - Policeman card signifying command.

Father card signifying statement.

Boy card signifying question.

Girl card signifying exclamation.

Box of objects: Car, dog, cat, horse, ball, pencil, whistle, etc.

Introduce cards two at a time. Do not begin the game until the children can 1) identify the cards, and 2) discriminate between the sentence types you are using the activity. Teacher will say, "What color is this block? Group must respond, "That is a question," and point to the boy card.

APPENDIX F - SAMPLE PAGE FROM TEACHER'S MANUAL  
(Continued)

Activity: The child selects an object from the box and picks up one of the cards. If he picks up the box (the question card), he asks the question about the object he has selected. "Is this dog real?" If he picks up the father he makes a statement about the object: "This dog is little." The activity continues until the children are familiar with all four sentence types.

## APPENDIX G - LIST OF MANIPULATIVE GAMES DEVELOPED FOR THE PROGRAMS

TABLE OF CONTENTS

## AUDITORY GAMES:

1. Sort-A-Sound
2. Alphabet Cabinet
3. Pick-A-Poster
4. Sound Lotto
5. Sound Wheel
6. Sort-A-Rhyme
7. Rhyme-Time
8. Spell-A-Word Board

## VISUAL GAMES:

1. Light-Up Letter Board
2. Sort-A-Deck
3. Letter Dominoes
4. Alpha Bing
5. Lazy Pup
6. Sort-A-Sound
7. Alphabet Insets
8. Memory Game with Letters
9. String-A-Letter
10. Pick-A-Puzzle
11. Spell Bound

## INTEGRATIVE GAMES:

1. Fishing Fun
2. Build-A-Word Block Puzzle
3. Build-A-Puzzle
4. Guess a Face
5. Supermarket



## APPENDIX H - TABLE OF CONTENTS FOR PAPER AND PENCIL ACTIVITIES

## GENERAL READINESS: VISUAL PERCEPTION

GRVP SET 1:	Likes and Differences in Pictures	32 sheets
GRVP SET 2:	Likes and Differences in Shapes	14 sheets
GRVP SET 3:	Left-Right Discriminations	8 sheets
GRVP SET 4:	Spatial Relationships	13 sheets
GRVP SET 5:	Position in Space	14 sheets
GRVP SET 6:	Perceptual Constancy	7 sheets
GRVP SET 7:	Figure Ground Perception	7 sheets
GRVP SET 8:	Hand-Eye Coordination	17 sheets
GRVP SET 9:	Hand-Eye Coordination	3 sheets

## GENERAL READINESS: AUDITORY PERCEPTION

GRAP SET 1:	Hear the Sounds	1 sheet
GRAP SET 2:	Marching Sounds	1 sheet
GRAP SET 3:	Rhyme	8 sheets

## GENERAL READINESS: LANGUAGE

GRL SET 1:	Word Relationships	4 sheets
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## VISUAL ALPHABET PROGRAM

VAP SET 1:	Matching Single Letters	23 sheets
VAP SET 2:	Position in Space	2 sheets
VAP SET 3:	Spatial Relationships	8 sheets
VAP SET 4:	Figure Ground Perception	3 sheets
VAP SET 5:	Alphabet Immersion	26 sheets
VAP SET 6:	Writing Letters (dot to dot)	13 sheets
VAP SET 7:	Writing Letters (incomplete)	13 sheets
VAP SET 8:	Matching Double Letters	11 sheets
VAP SET 9:	Matching Words	27 sheets

## AUDITORY ALPHABET PERCEPTION

AAP SET 1:	Match Beginning Sounds	17 sheets
AAP SET 2:	Sound and Color	1 sheet
AAP SET 3:	Sound Matching with Consonants	9 sheets
AAP SET 4:	Middle Sounds	4 sheets
AAP SET 5:	Final Sounds	10 sheets
AAP SET 6:	Rhyme	16 sheets

## AUDIO-VISUAL ALPHABET PROGRAM

SET 1:	Matching Single Letters	8 sheets
SET 1a:	Letter to Sound	12 sheets
SET 2:	Final Sounds	10 sheets
SET 3:	Match Letter to Picture	6 sheets
SET 4:	Writing Letters	4 sheets
SET 5:	Writing Letters (Vowels)	5 sheets
SET 6:	Word-Picture and Word	1 sheet
SET 7:	Writing Letters	14 sheets

## APPENDIX I - TABLE OF CONTENTS - TAPES

INDEX OF TAPES - EXHIBIT E

Each tape is presented in a packet with a listening board and a set of cards. The backs of the cards are color-coded so that the listening activity is self-corrective and does not require teacher supervision. The tapes are being developed for the program in line with the behavioral goals set forth.

General Readiness - Auditory Perception

- GRAP #1 - Discrimination of Like and Different In Sound
- GRAP #2 - Identification of Sounds
- GRAP #3 - Auditory Sequencing

General Readiness - Language

- GRL #1 - Discrimination of Full Sentence and Sentence Fragment
- GRL #2 - Comprehension of Verb Tense

Auditory Alphabet Perception Program

- AAPP #1 - Likes and Differences In Words
- AAPP #2 - Likes and Differences In Beginning Sounds
- AAPP #3 - Likes and Differences in Final Sounds
- AAPP #4 - Recognition of Short Vowel Sounds
- AAPP #5 - Recognition of Like and Different Middle Sounds Within Words
- AAPP #6 - Word Blending

Auditory Visual Alphabet Program

- AVAP #1 - Same as AAPP Tape #2
- AVAP #2 - Association of Letter Form With Letter Name
- AVAP #3 - Same as AAPP #3
- AVAP #4 - Association of Short Vowel Letter With Short Vowel Sound
- AVAP #5 - Same as AAPP #5
- AVAP #6 - Same as AAPP #6

## LISTENING ACTIVITY

GRAP #1Discrimination Of Like and Different Sounds

Listen, ding - ding.

What Sound was that? That's right. It was a bell.

Listen again. Was that the same sound you heard before?

Of course it was.

Now, every time you hear the same sound you will put a chip on the listening board. Let's try it. We will begin with the dog row. I will produce two sounds. If the sounds are alike, put a chip on the first blue square.

Whistle is blown twice. Did you put a chip on the blue square? I hope so, the two sounds were the same. Listen again.

This time, if you hear the same two sounds, put a chip on the red square. Do not put a chip on the red square if the sounds are different. Listen again.

Whistle - bell. Did you put a chip on the red square. I hope not. Whistle and bell - these are different sounds.

Now, let us decide about the rest of the squares. Remember, put a chip down only if the two sounds you hear are alike.

24 sounds like and different.

## APPENDIX J RECORD SHEETS

## GENERAL READINESS LANGUAGE

	<u>Objective or Behavioral Goal</u>	<u>Activity</u>	<u>Date of Completion</u>	<u>Degree of Success</u>
I.	Demonstrates listening ability by attending to story.	Activity 1		
		Activity 2		
II.	a. Distinguishes between sentence and sentence fragment.	Activity 2		
	b. Produces complete sentence.	Activity 1		
III.	Describes event in front of group expressing complete idea.	Activity 1		
		Activity 2		
IV.	Uses pronouns correctly in sentences.	Activity 1		
V.	Uses Not construction orally.	Activity 1		
VI.	Uses tense appropriately.	Activity 1		
		Activity 2		
VII.	Demonstrates comprehension of words of relationship.	Activity 1		
		Activity 2		
		Activity 3		
VIII.	Produces four basic sentence types at will.	Activity 1		
IX.	Changes sentence from active to passive.	Activity 1		
		Level 1		
		Activity 1		
		Level 2		
X.	Develops and names categories.	Activity 1		
XI.	Demonstrates ability to produce paradigms.	Activity 1		
XII.	Demonstrates ability to expand a sentence.	Activity 1		

## APPENDIX K PRE- AND POST-TEST SCORES ACCORDING TO GROUP

TREATMENT	GATES VISUAL	PRE	POST	DIFFERENCE
13 subjects	MEAN	5.6	9.8	4.2
GENERAL	S.D.	5.5	7.8	
READI-	S. ERR.	1.54	2.17	
NESS	STANINE	3	4	1
VAP	MEAN	3.5	10.8	9.3
II	S.D.	3.2	6.6	
13	S.ERR.	.88	1.83	
subjects	STANINE	2	4	2
AUDITORY	MEAN	3	6.5	3.5
ALPHABET	S.D.	2.5	4.1	
14	S. ERR.	.68	1.11	
subjects	STANINE	2	3	1
AUDITORY	MEAN	3.1	8.8	5.7
VISUAL	S.D.	2.6	6.5	
13	S. ERR.	.721	.81	-
subjects	STANINE	2	3	1

PRE-SCORE PARAMETERS HAVE BEEN RECALCULATED TO ACCOUNT  
FOR ATTRITION.



PRE- AND POST-TEST SCORES ACCORDING TO GROUP

TREATMENT	GATES VISUAL	PRE	POST	DIFFERENCE
13 subjects	MEAN	10.4	14	3.6
GENERAL	S.D.	4.4	3.2	
READI-	S. ERR.	1.24	.9	
NESS	STANINE	2	33	1
VAP	MEAN	8.8	14	5.2
II	S.D.	3.9	3.9	
13	S.ERR.	1.1	1.1	
subjects	STANINE	2	3	1
AUDITORY	MEAN	10.1	12.9	2.8
ALPHABET	S.D.	2.8	4.1	
14	S. ERR.	.75	1.1	
subjects	STANINE	2	3	1
AUDITORY	MEAN	10	13.4	3.4
VISUAL	S.D.	3.8	5.1	
13	S. ERR.	1.05	1.41	
subjects	STANINE	2	3	1

PRE-SCORE PARAMETERS HAVE BEEN RECALCULATED TO ACCOUNT FOR ATTRITION.

PRE- AND POST-TEST SCORES ACCORDING TO GROUP

TREATMENT	PINTNER- CUNNINGHAM	PRE	POST	DIFFERENCE
13 subjects				
GENERAL	MEAN	26.3	35.6	9.3
READI-	S.D.	13.5	13.1	
NESS	S. ERR.	3.74	3.63	
	STANINE	2	4	2
VAP				
II	MEAN	20.8	29.7	8.9
13	S.D.	7.6	14.1	
subjects	S. ERR.	2.12	3.92	
	STANINE	2	3	1
AUDITORY				
ALPHABET	MEAN	23.2	31	7.8
14	S.D.	12.6	13.1	
subjects	S. ERR.	3.37	3.52	
	STANINE	2	3	1
AUDITORY				
VISUAL	MEAN	24.7	41.3	16.6
13	S.D.	12.8	15	
subjects	S. ERR.	3.56	4.17	
	STANINE	2	4	2

PRE-SCORE PARAMETERS HAVE BEEN RECALCULATED TO ACCOUNT FOR ATTRITION.

PRE- AND POST-TEST SCORES ACCORDING TO GROUP

TREATMENT	LLR	POST
13 subjects		
GENERAL	MEAN	10
READI-	S.D.	4.2
NESS	S. ERR.	1.16
	STANINE	
VAP		
II	MEAN	9.3
13	S.D.	3.1
subjects	S.ERR.	.87
	STANINE	
AUDITORY		
ALPHABET	MEAN	11.1
14	S.D.	2.7
subjects	S. ERR.	.74
	STANINE	
AUDITORY		
VISUAL	MEAN	10.1
13	S.D.	3.2
subjects	S. ERR.	.9
	STANINE	

PRE-SCORE PARAMETERS HAVE BEEN RECALCULATED TO ACCOUNT FOR ATTRITION.

PRE- AND POST-TEST SCORES ACCORDING TO GROUP

TREATMENT	MDLR	PRE	POST	DIFFERENCE
13 subjects	MEAN	3	9	6
GENERAL	S.D.	4	3.2	
READI-	S. ERR.	1.1	.88	
NESS	STANINE	2	5	3
VAP	MEAN	2.8	9.3	6.5
II	S.D.	2.8	3.6	
13	S.ERR.	.79	3.66	
subjects	STANINE	2	5	3
AUDITORY	MEAN	3.5	8	4.5
ALPHABET	S.D.	4.5	4.1	
14	S. ERR.	1.2	1.1	
subjects	STANINE	2	5	3
AUDITORY	MEAN	5.2	10.7	5.5
VISUAL	S.D.	3.2	4	
13	S. ERR.	.91	1.13	
subjects	STANINE	3	6	3

PRE-SCORE PARAMETERS HAVE BEEN RECALCULATED TO ACCOUNT FOR ATTRITION.

PRE- AND POST-TEST SCORES ACCORDING TO GROUP

TREATMENT	LETTER NAMES	PRE	POST	DIFFERENCE
13 subjects GENERAL READI- NESS	MEAN	2.2	20	17.8
	S.D.	4.3	13.1	
	S. ERR.	1.19	3.64	
	STANINE	1	3	2
VAP II 13 subjects	MEAN	3.6	26.3	22.7
	S.D.	5.2	13.2	
	S.ERR.	1.46	3.66	
	STANINE	2	4	2
AUDITORY ALPHABET 14 subjects	MEAN	2.6	19	16.4
	S.D.	3.9	16.3	
	S. ERR.	1.05	4.35	
	STANINE	2	4	2
AUDITORY VISUAL 13 subjects	MEAN	1.6	28.5	26.9
	S.D.	4.8	14.9	
	S. ERR.	1.33	4.15	
	STANINE	1	5	4

PRE-SCORE PARAMETERS HAVE BEEN RECALCULATED TO ACCOUNT  
FOR ATTRITION.

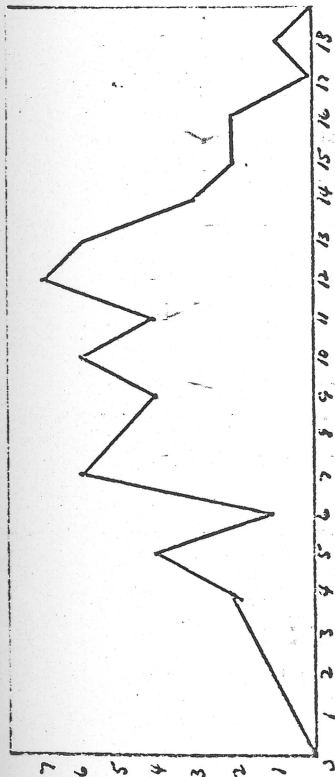


PRE- AND POST-TEST SCORES ACCORDING TO GROUP

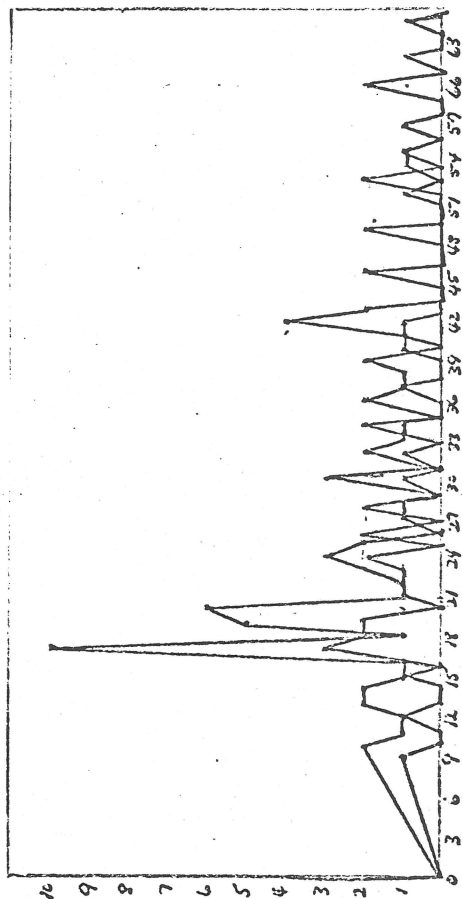
TREATMENT	PHONEMES	PRE	POST	DIFFERENCE
13 subjects GENERAL READI- NESS	MEAN	8	11.7	3.7
	S.D.	4	3.5	
	S. ERR.	1.12	.98	
	STANINE	2	3	1
VAP II 13 subjects	MEAN	6.1	9.9	3.8
	S.D.	3.3	3.1	
	S. ERR.	.91	.86	
	STANINE	1	2	1
AUDITORY ALPHABET 14 subjects	MEAN	8.1	11.7	3.6
	S.D.	3.9	4	
	S. ERR.	1.04	1.08	
	STANINE	2	3	1
AUDITORY VISUAL 13 subjects	MEAN	6.3	12.3	6
	S.D.	2.5	5.6	
	S. ERR.	.71	1.56	
	STANINE	1	3	2

PRE-SCORE PARAMETERS HAVE BEEN RECALCULATED TO ACCOUNT FOR ATTRITION.

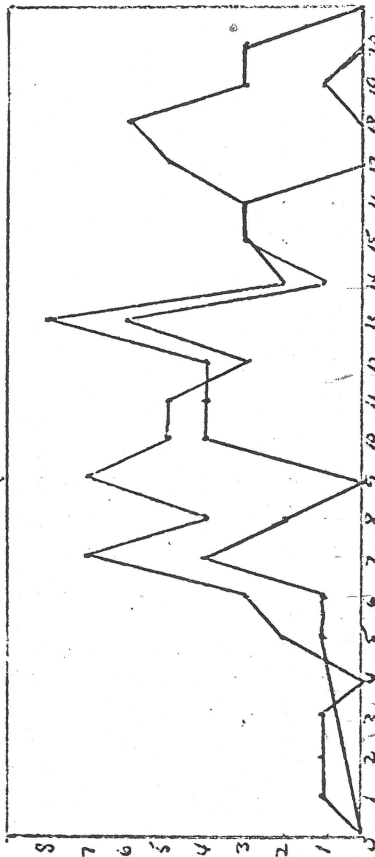
APPENDIX L



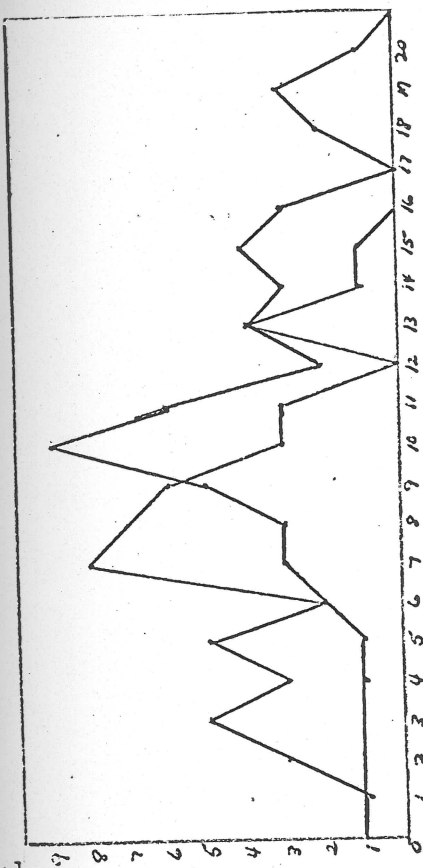
L.L.R.



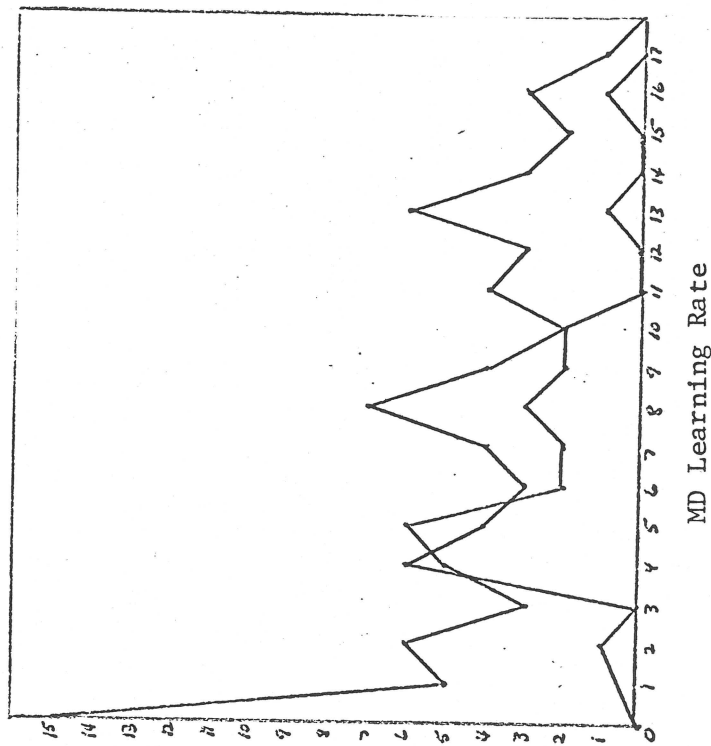
I.Q.



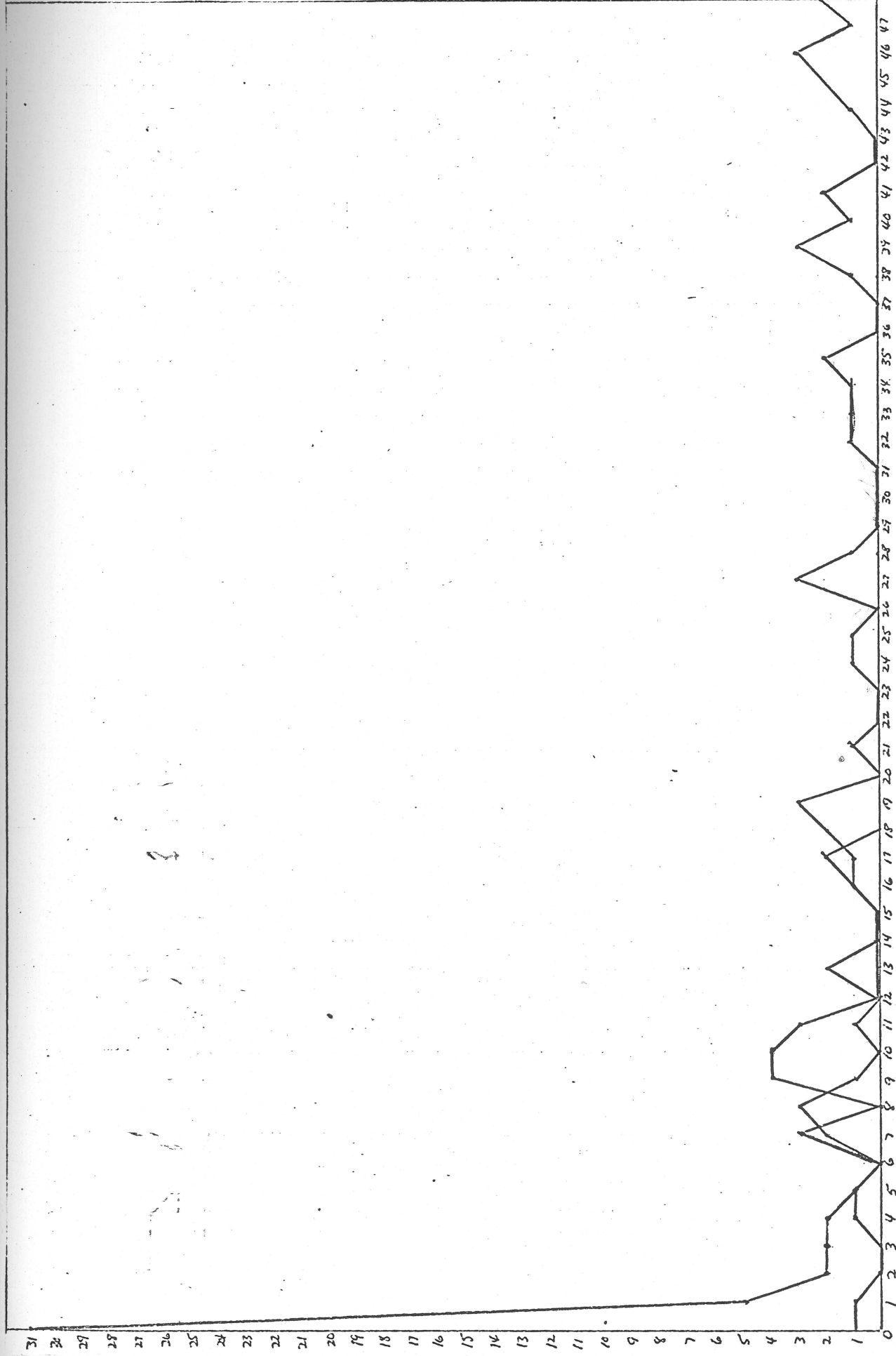
ABC Gates Auditory



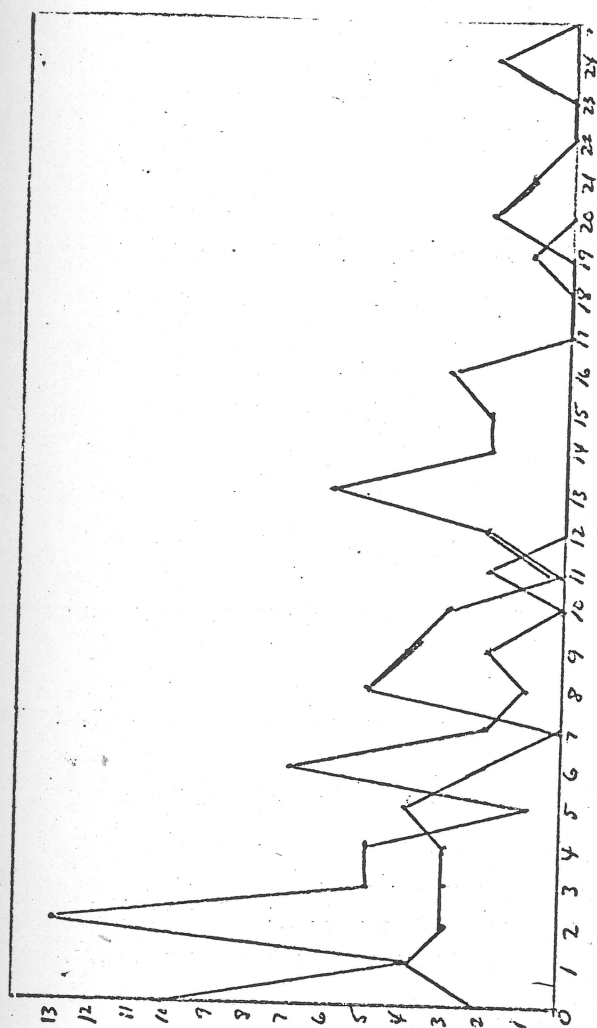
Phonemes Part I



MD Learning Rate

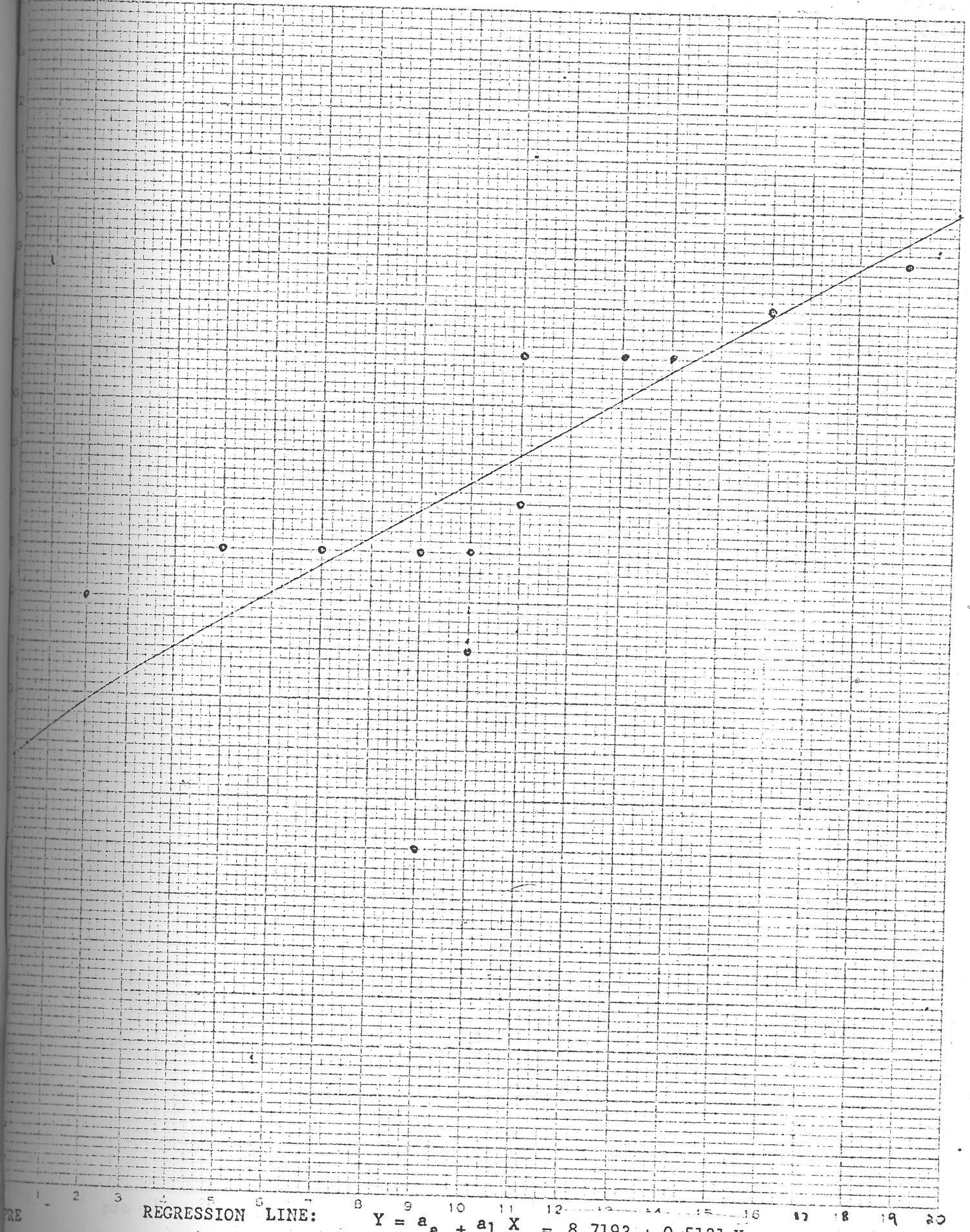


LETTER NAME



GATES VISUAL

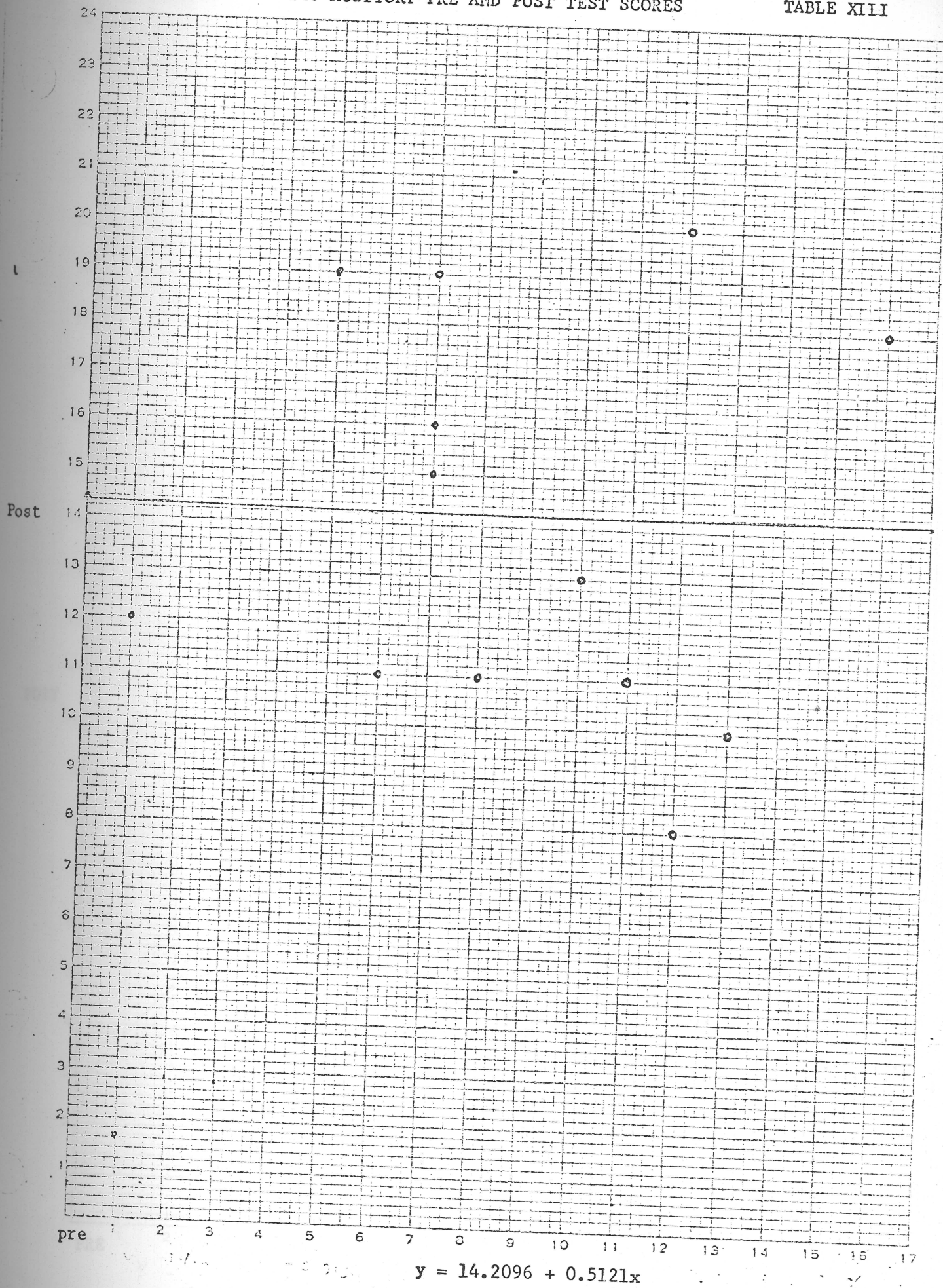
# SCATTERGRAM REPRESENTING GATES AUDITORY PRE AND POST SCORES



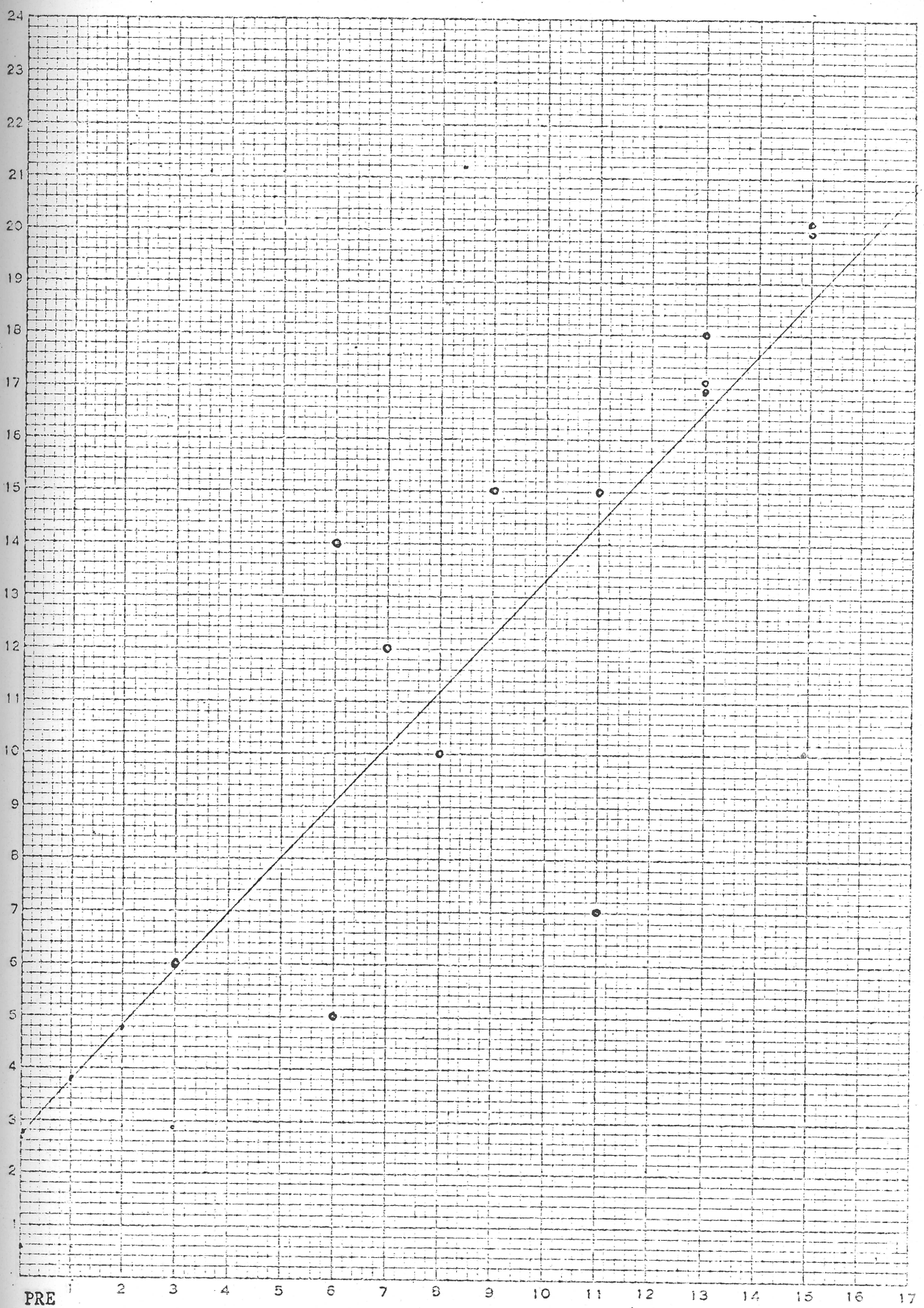
REGRESSION LINE:

$$Y = a_a + a_1 X = 8.7193 + 0.5121 X$$





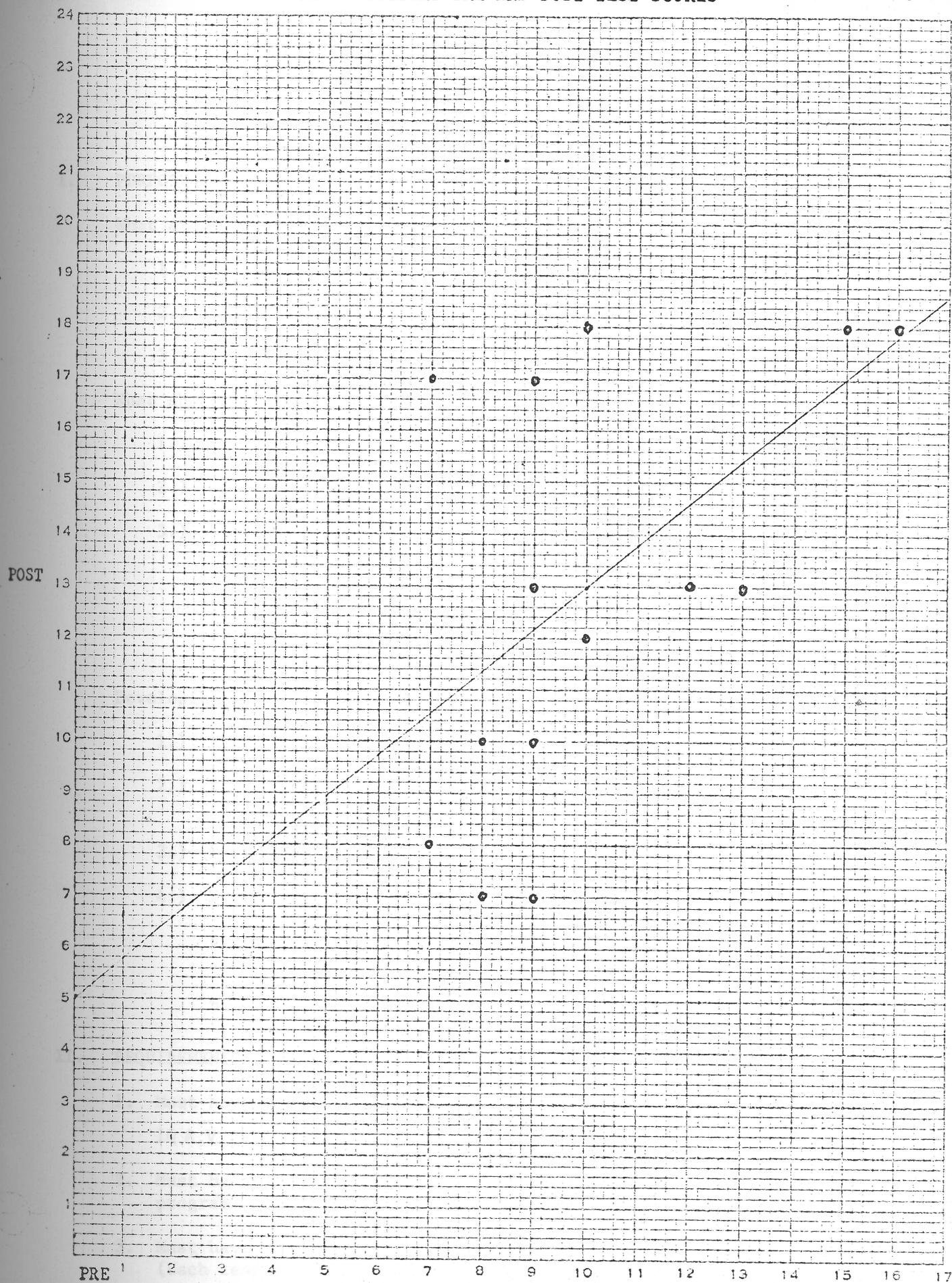
POST



$$y = 1.0689 + 2.7718x$$

## SCATTERGRAM OF GATES AUDITORY PRE AND POST TEST SCORES

TABLE XII





APPENDIX NWORKSHOP INTRODUCTION

## I. PURPOSE:

What are we trying to accomplish?

- 1.) Positive feeling about school.
- 2.) Positive feeling about themselves as learners
- 3.) Pre-requisite skills for 1st grade.

What should we teach?

- 1.) Total atmosphere.
- 2.) Successful experiences and reinforcement.
- 3.) Pre-requisite skills:

How

- for each child.

What

Developing appropriate curriculum:

- 1.) Knowing what we are teaching.
- 2.) Knowing the characteristics of the children we are teaching it to.
- 3.) Knowing the progress of these children.
- 4.) Knowing the results.
  - a. Gives us an idea of what program is appropriate for what children.
  - b. Suggests modifications.

## II. REQUIREMENTS:

1. Must have adequate pre-tests on 60 children.  
IQ A.V. shift, P.C., Gates, Murphy-Durrell-Teacher Test.
2. Must be able to distribute the children randomly for the program.
3. Must have equal instructional time - 2 hours per group per day.  
(Each teacher could spend four hours in a setting for 12 weeks.)

## II. REQUIREMENTS (CONTINUED):

4. Must avoid contamination and keep population consistent.
5. Must keep records - accept taping - observe photos.
6. Must give battery of post-tests.

## TREATMENT GROUPS:

TREATMENT - Same curriculum with different emphasis.

1. General Readiness.
2. AAP
3. VAP
4. AVAP

LANGUAGE - PERCEPTION - CREATIVITY - 40 minutes to each area:

Attitude Test end of week.

## CURRICULUM:

1. Set of behavioral objectives in each area.
2. Teacher's Manual.
3. Tapes.
4. Games.
5. Paper and pencil activities.
6. Individual child records.

## TIME SCHEDULE:



APPENDIX OVISUAL ALPHABET PERCEPTIONINVENTORY OF MATERIALSTeacher-Made Materials

Pick-a-Puzzle  
 Lazy Pup  
 Alpha-Bing with Letters (Self-corrected by color)  
 Alpha-Bing with Large and Small Letters  
 Sort-A-Letter - Capitals      Game 1A  
 Sort-A-Letter - Lower-case  
 Sort-A-Deck Letter Combinations      Game 1B  
 Sort-A-Deck with Words      Game 1C  
 Sort-A-Deck Match Capitals to Lower Case      Game 1D  
 Memory Game with Letters  
 Letter Dominoes - Game 2A  
 Letter Combination Dominoes:      Game 2B  
 Dominoes with Words:      Game 2C

---

Commercial Materials:

Letter Form Board  
 Color-Coded Paper  
 Manuscript letter Board  
 Victory Puzzle  
 Picture Word Cards  
 Philograph Matching positional alphabet cards  
 Alphabet puzzle for matching small and capital letters  
 Instructo-Magnetic Chalk Board  
 Sentence Fun Game  
 Mystery Pigs

VISUAL-AUDITORY ALPHABET

INVENTORY OF MATERIALS

TEACHER-MADE:

Guess-A-Face Puzzle  
Alpha-Bing with Letters  
3 part linguistic puzzle  
Fishing fun game  
Alphabet Block puzzle  
Alphabet Cabinet with Board  
Rhyming mats to go with rhyming objects  
Vowel Board  
Plastic letter to outline set  
Pick-a-puzzle sets

---

COMMERCIAL:

Philograph vowel sort sets  
Consonant charts  
Vowel pictures for peg board  
Consonant pictures for peg board  
Magnetic Board  
Color-cued paper for beginning writing  
Teach key set for beginning sounds and middle sounds  
Philograph picture and sound matching set  
Sort and Sound Set  
Carnival of Beginning sounds  
Farmers hat  
Mystery pigs for letter sorting  
Playschool match-up sets  
Simplex puzzle  
Find-and-fit puzzles  
ABC lotto  
Word match game  
Instructo Magnetic Chalk Board

AUDITORY ALPHABET PROGRAM

## INVENTORY OF MATERIALS

TEACHER-MADE MATERIALS

Sort-a-rhyme Game 12  
Find-the-rhyming picture Game 14  
Sort-a-vowel sound  
Sort-a-deck Middle Sound  
Sound Wheel  
Pick-A-Poster Game 5  
Sort-A-Sound Middle Sounds  
Sound Lotto  
AAPP animals  
Alphabet Cabinet

COMMERCIAL MATERIALS

Carnival of Beginning Sounds  
Consonant charts  
Consonant Pictures for Peg Board  
Vowel Pictures for Peg Board  
Objects that Rhyme  
Farmers Hat  
Rhyming puzzles

GENERAL READINESS PROGRAM

## INVENTORY OF MATERIALS

Auditory Perception

Noah's Ark Game  
Objects that rhyme  
DLM tape set  
Farmers hat

Visual Perception

Play block matching set  
Dominoes  
Memory Games  
Learning Lotto  
Zoo Lotto  
Object Lotto  
Map Set for Directions  
Positional Card Set  
Peg Set  
Fit-a-Space  
Form Board  
Clorox Pig  
Graduated Doll Set

LANGUAGE

- 1 Picture Cards for "not" Construction (AVAP).
  - 1 Consonant Poster (AAP)
  - 1 Sentence Cards
  - 1 Animals for Noah's Ark or Mighty Mouse (AAP)
  - 1 Category Sort (VAP), (AVAP)
  - 2 Door-to-Door (GR)
  - 1 Alphabet Cards (AVAP)
  - 1 Alphabet Cards with Pictures (BG-4) (AAP & AVAP)
  - 1 Language Categories (GRL)
  - 1 Sorting - Sound Characteristics (AAP & AVAP)
- 

Commercial

2 Plastic Letters.

2 ABC Books.

Objects for Category Sort.



CREATIVE VAP, AVAP & AAP

## INVENTORY OF MATERIALS

AVAP Alpha-Mats for Musical Chairs

VAP String-A-Letter

AAP Letter Inserts

Acting out ABC

Letter Cards

ABC Records

General Readiness Records

Puppet

Bean Bags

TAPE SET

## INVENTORY OF MATERIALS

## TAPE

Category mat

Alphabet Cards

Tape Recorder

Tapes: (13)

2 Card Box (1 tray - 1 box set)

Plastic Counters

Verb-Tense Cards

14 Listening Boards

APPENDIX P

10th week.

Date: Jan 12 - 16.

## I. GENERAL READINESS - PURPLE TAG

## Total Group Introduction

GRAP Kit #4 - Monday, Wednesday, Friday; individualized.

GRVP Set #6.

Auditory: Beat out rhythmic patterns - repeat from group.

TM #8.

## Small Group Activities:

Reinforce all skills with continuous flow of materials for this group.

Introduction of Count-A-Shapes Game.

## Individual Activities:

## Continue:

Rubber band form board.

Peg board designs.

Puzzles - up to 23 pieces.

## II. VAP - RED TAG VISUAL ALPHABET

## Total Group Introduction

VAP Kit #8.

## Small Group Activities:

Letter Dominoes.

Lotto with Words)  
Word Dominoes) at separate tables.

## Individual Activities

Combine all.

SAMPLE OF TEACHER PLAN FOR CREATIVE PROGRAM

THEME: Travel

DAY'S THEME: Airplanes

DATE: December 9, Tuesday

## CREATIVE ACTIVITY:

I. GENERAL READINESS - PURPLE TAG

Art Project: Make paper airplanes.

Poem - Story - Drama: Talk about what airplanes do, Mail, Freight, Passengers, Hurricanes, and Air Force Planes.

Read airport story.

Music-Dance-Game: Play records. Children march in circle, pretending to be airplanes.

II. VAP - RED TAG - VISUAL ALPHABET

Art Project: Make paper airplanes; put letters on wings.

Poem - Story - Drama: Same as Purple Tag.

III. AAP - WHITE TAG - AUDITORY ALPHABET

Art Project: Make paper airplanes.

Poem - Story - Drama: Read airport stories. Show pictures from story. "Here is a picture of the p----. Who drive the plane? Airplanes are kept in a h-----." etc.

IV. AVAP - GREEN TAG - AUDITORY VISUAL ALPHABET

Art Project: Same as Red Tag.

Poem - Story - Drama: Same as White Tag.

Date: Jan. 12 - 16

Double Consonants

Final Sound

III. AAP - WHITE TAG - AUDITORY ALPHABET

Total Group Introduction:

Mighty Mouse - TM 7

Small Group Activities:

Fish Pond. Reinforce all skills with continuous flow of materials for this group.

TM 8 - Middle Sounds (Did not do this because ability to discriminate these sounds did not seem to develop.)

Individual Activities

IV. AVAP - GREEN TAG - AUDITORY-VISUAL ALPHABET

Total Group Introduction:

Flash Card Presentation of Letters

AVAP #5 Kit

Noah's Ark Game TM7

Small Group Activities:

Fish Pond

Sound Lotto

Alpha-Bingo

Individual Activities:

Combine all.



Date: Week of Dec. 1-5

I. GENERAL READINESS - PURPLE TAG

## Total Group Introduction:

Aptitude Test Monday

Matrix - relationship card

Songs - games - fingerplays

## Small Group Activities:

Colors, "not" game, and Quick-Quick-Quick

## Individual Activities:

Categories, working with equipment in room

II. VAP - RED TAG VISUAL ALPHABET

## Total Group Introduction:

Test on Monday V.W.Y. Dec. 1

Compare letters

Making letter with fingers and bodies

Finding letters in their names

## Small Group Activities:

Use letters on matrix

Relationship words. Y is on the table - etc.

Quick - Quick - Quick. Mr. Detective Game with new letters.

## Individual Activities:

Date: December 8 - 12

## Consonants Review

III. AAP - WHITE TAG - AUDITORY ALPHABET

## Total Group Introduction:

Peter Piper's Alphabet Book

Knock - knock with sounds

Alliteration poems. Book. Pear Shaped Hill.

## Small Group Activities:

Show and Tell Stories

Rhyming words. Poems. Nursery Rhymes.

## Individual Activities:

Matching sound-alike objects and pictures.

IV. AVAP - GREEN TAG - AUDITORY VISUAL ALPHABET

Dec. 8

## Total Group Introduction:

Reviews with mag. letters Pear Shaped Hill

Poems - Nursery Rhymes and songs

## Small Group Activities

Matrix with letters

Quick Trick tense

Short poems

## Individual Activities

## APPENDIX Q RAW DATA

## VAP PROGRAM

Number	Gates Audio		Phonemes		Mdlr.		Gates Visual		Letters Names		ILR		IQ	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1	12	8	6	13	8	8	2	9	0	33	7	7	19	18
3	10	13	8	6	7	6	9	13	1	5	7	7	17	12
14	8	11	7	11	5	10	3	3	0	19	7	7	20	23
25	11	11	8	13	0	11	2	16	0	46	9	9	17	32
28	16	18	13	13	4	13	3	20	17	47	15	15	37	62
31	12	20	9	5	1	9	2	0	8	24	6	6	24	42
36	13	10	2	10	6	9	2	5	0	21	11	11	21	18
42	7	16	7	10	0	4	5	15	9	35	11	11	34	36
56	7	19	0	4	0	5	0	10	0	13	5	5	10	17
48	7	15	5	9	2	14	11	13	8	41	10	10	19	39
49	5	19	3	13	0	9	3	13	3	27	7	7	24	41
57	6	11	5	11	3	17	4	21	0	13	14	14	17	17
55	1	12	7	11	1	7	0	3	2	19	12	12	12	30

AAP

Number	Gates Audio		Phonemes		Mdlr.		Gates Visual		Letters Names		LLR		IQ	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
2	10	11	7	15	2	8	0	4	1	9	9	17	15	
7	9	13	13	7	0	8	0	8	0	10	12	11	24	
10	10	13	2	12	4	8	1	1	0	4	5	22	24	
15	11	14	8	7	3	13	6	14	2	28	9	53	42	
19	16	18	2	14	5	11	6	8	4	18	11	20	52	
24	11	16	9	10	0	4	0	8	0	11	4	26	42	
26	14	17	13	18	13	13	6	14	3	25	16	28	46	
30	7	13	11	9	1	16	1	10	0	35	18	26	42	
34	13	17	13	11	0	15	11	24	1	46	14	32	30	
43	9	7	8	15	0	8	4	12	0	10	8	18	36	
38	19	19	10	9	9	8	19	24	16	38	10	55	60	
47	2	12	3	16	2	7	8	10	1	16	5	17	30	
13	5	13	5	10	0	5	2	1	1	11	10	17	21	

Number	Gates Audio		Phonemes		Mdlr.		Gates Visual		Letters Names		LLR		IQ	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
6	6	14	9	10	5	8	2	9	0	27	8		23	43
9	13	17	9	19	6	14	0	2	5	39	13		20	43
17	6	5	9	0	5	5	2	0	0	10	5		14	25
22	11	7	4	8	0	4	0	16	0	7	4		17	22
29	8	10	7	10	10	12	4	8	0	27	12		34	57
33	13	18	8	20	5	13	7	20	0	48	14		42	54
35	15	20	7	15	3	13	6	16	0	39	8		30	46
37	9	15	1	12	4	13	3	13	0	39	13		19	32
41	15	20	8	16	9	12	2	15	17	44	12		57	65
45	7	12	3	8	10	12	2	5	0	9	8		17	34
52	11	15	7	19	8	4	6	3	0	32	12		20	60
54	3	6	4	9	2	14	0	2	0	9	13		13	17
59	13	16	7	14	1	16	7	6	0	41	10		16	39



GENERAL READINESS

Number	Gates Audio		Phonemes		Mdlr.		Gates Visual		Letters Names		LLR		IQ	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Post	Post	Pre	Post
2	10	11	7	15	2	8	0	4	1	9	9	17	15	
7	9	13	13	7	0	8	0	8	0	10	12	11	24	
10	10	13	2	12	4	8	1	1	0	4	5	22	24	
15	11	14	8	7	3	13	6	14	2	28	9	53	42	
19	16	18	2	14	5	11	6	8	4	18	11	20	52	
24	11	16	9	10	0	4	0	8	0	11	4	26	42	
26	14	17	13	18	13	13	6	14	3	25	16	28	46	
30	7	13	11	9	1	16	1	10	0	35	18	26	42	
34	13	17	13	11	0	15	11	24	1	46	14	32	30	
43	9	7	8	15	0	8	4	12	0	10	8	18	36	
38	19	19	10	9	9	8	19	24	16	38	10	55	60	
47	2	12	3	16	2	7	8	10	1	16	5	17	30	
13	5	13	5	10	0	5	2	1	1	11	10	17	21	

### LITERATURE CITED

- Ashlock, Patrick R., 1967, "Visual Perception of Children in the Primary Grades and Its Relation to Reading Performance", Child Development.
- Ausubel, David R., 1967, "The Effects of Cultural Deprivation on Learning Patterns", Education and Social Crisis, ed. Everett T. Keach, Jr., et al. New York: John Wiley and Sons, 1967, pp. 156-61.
- Avila, Donald; Gordon, Ira T.; and Curran, Robert, 1968, "Behavioral Changes in Culturally Disadvantaged Children as the Result of Tutoring", Psychological Reports, XXII, 388-90.
- Bagford, Jack, 1968, "Reading Readiness Scores and Success in Reading", The Reading Teacher, XXI, 324-28.
- Balmuth, Miriam, 1968, "Visual and Auditory Modalities: How Important Are They?", Paper presented at the International Reading Association Conference, Boston, April, 1968. (United States Department of Health, Education, and Welfare, Office of Education. Research in Education, IV/4, 1969.)
- Baratz, Joan C., 1969, "Linguistic and Cultural Factors in Teaching Reading to Ghetto Children", Elementary English, XLVI, 199-203.
- Baratz, Joan C., and Shuy, Roger W., eds. 1969. Teaching Black Children to Read. Washington, D.C.: Center for Applied Linguistics.
- Barrett, Thomas C., 1962, "The Relationship between Selected Reading Readiness Measures of Visual Discrimination and First-Grade Reading Achievement", University of Minnesota dissertation.
- Baughman, E. Earl, and Dahlstrom, W. G., 1968. Negro and White Children, New York and London: Academic Press.
- Bereiter, Carl, and Engelmann, Siegfried, 1966, Teaching Disadvantaged Children in the PreSchool, New Jersey: Prentice-Hall and Company.
- \_\_\_\_\_, 1967. Language Learning Activities for the Disadvantaged Child. New York: Anti-Defamation League of B'nai B'rith.
- Bereiter, Carl; Engelmann, Siegfried; Osborn, Jean; and Reidford, Philip A., 1966, "An Academically Oriented PreSchool for Culturally Deprived Children", Pre-School Education Today, ed. Fred M. Hechinger. New York: Doubleday and Co., 1966, pp. 105-36.
- Bernstein, Basil, 1967, "Linguistic Codes, Hesitation Phenomena, and Intelligence", and "Social Class, Linguistic Codes, and Grammatical Elements", Education and Social Crisis, ed. Everett T. Keach, Jr., et al., New York: John Wiley & Sons, 1967, pp. 179-209.

# LITERATURE CITED (CONTINUED)

- Berry, Judith W., 1967, "Matching of Auditory and Visual Stimuli by Average and Retarded Readers", Child Development, XXCIII, 827-33.
- Betts, E. A., "Reading: Visual Motor Skills", Education, 88291-95.
- Birch, Herbert and Belmont, Lillian, 1964. "Auditory-Visual Integration in Normal and Retarded Readers", American Journal of Orthopsychiatry, XXXIV, 852-61.
- Black, Millard H., 1966. "Characteristics of the Culturally Disadvantaged Child", The Disadvantaged Child: Issues and Innovations, ed. Joe L. Frost and Glenn Hawkes. Boston: Houghton Mifflin Co., 1966, pp. 45-50.
- Blank, Marian and Solomon, Francis, 1968, "A Tutorial Program To Develop Abstract Thinking in Socially Disadvantaged Pre-School Children", Child Development, XXXCIII, 379-390.
- Bloomfield, L., and Barnhart, C. L., 1961. Let's Read: A Linguistic Approach. Detroit: Wayne State University Press.
- Bottenberg, R. A., and Ward, Joe H., Jr., 1963. "Applied Multiple Linear Regression", Technical Documentary Report, PRL-TRD 63-61 March 1963.
- Brickner, C. Ann, 1967. An Experimental Program Designed to Increase Auditory Discrimination with Head Start Children, Huntington, N.Y.: Educational Development Laboratories.
- Brottman, Marvin A., ed. 1968. Language Remediation for the Disadvantaged Preschool Child. Monographs for the Society for Research in Child Development, Serial No. 124, XXXIII/8, "Introduction", pp. 1-5.
- Bruner, Jerome S., 1966. "The Cognitive Consequences of Early Sensory Deprivation", The Disadvantaged Child: Issues and Innovations, ed. Joe L. Frost and Glenn Hawkes. Boston: Houghton Mifflin Co., 1966, pp. 137-44.
- Bruner, Jerome S.; Oliver, Rose R.; Greenfield, Patricia; et al., 1966. Studies in Cognitive Growth, New York: John Wiley & Sons.
- Bryan, Quentin R., 1964. "Relative Importance of Intelligence and Visual Perception in Predicting Reading Achievement", California Journal of Educational Research, XV, 44-48.
- Cazden, Courtney B., 1968. "Subcultural Differences in Child Language: An Inter-disciplinary Review", Disadvantaged Child, Vol. 2: Head Start and Early Intervention, ed. Jerome Hellmuth, New York: Brunner/Mazel, 1968, pp. 217-56.
- Chall, Jeanne, 1968. "Auditory Blending Ability: A Factor in Success in Beginning Reading", The Reading Teacher, XVII.

## LITERATURE CITED (CONTINUED)

- \_\_\_\_\_, 1967. Learning to Read: The Great Debate. New York: McGraw-Hill and Company.
- Clyde, Dean, et. al., 1966. Multivariate Statistical Programs, University of Miami, Florida.
- Clymer, Theodore, 1968. "What is Reading? Some Current Concepts", Innovation and Change in Reading Instruction. The Sixty-seventh Yearbook of the National Society for the Study of Education, Part II, ed. Helen M. Robinson. Chicago: University of Chicago Press.
- Connell, Donna, 1968. "Auditory and Visual Discrimination in Kindergarten", Elementary English, XLV, 51-54.
- Cox, Marian Monroe, 1949. "Review of Gates Reading Readiness Test", The Third Mental Measurement Yearbook, ed. by Oscar Burros. Rutgers University Press, 1949, p. 516-517.
- Cronbach, Lee J., 1969. "Heredity, Environment, and Educational Policy", Harvard Educational Review, XXXIX/2, 338-47.
- Cronbach, Lee J. and Suppes, J. Patrick. Research for Tomorrow. MacMillan and Co. Toronto, 1969.
- Delacato, Carl H., 1963. The Diagnosis and Treatment of Speech and Reading Problems, Charles Thomas Publishers, Springfield, Illinois.
- Deutsch, Martin, 1964. Selected Papers. New York: Basic Books.
- \_\_\_\_\_, 1966. "Early Social Environment: Its Influence on School Adaptation", Pre-School Education Today, ed. Fred M. Hechinger. New York: Doubleday and Company, 1966, pp. 13-24.
- Diack, Hunter, 1960. Reading and the Psychology of Perception. Nottingham: Ray Palmer, Ltd.
- Dickie, Joyce P. 1968. "Effectiveness of Structured and Unstructured (Traditional) Methods of Language Training", Language Remediation for the Disadvantaged Pre-School Child, ed. M. A. Brottman, Monographs for the Society for Research in Child Development, Serial No. 124, XXXVIII/8 (1968), 62-78.
- Di Lorenzo, Louis T., et al. 1968. "Empirical Bases for a Pre-Kindergarten Curriculum for Disadvantaged Children", Paper presented at the Annual Convocation of the Educational Research Association of New York State, November, 1968.
- Di Lorenzo, Louis T., and Slater, R., 1968. "Evaluative Study of Pre-Kindergarten Programs for Educationally Disadvantaged Children", Follow-up and Replication, Exceptional Children: XXXV, 111-19.



## LITERATURE CITED (CONTINUED)

- Doman, Glenn, 1964. How To Teach Your Baby to Read. New York: Random House.
- Durkin, Dolores, 1968. "When Should Children Begin To Read?", Innovation and Change in Reading Instruction. The Sixty-seventh Yearbook of the National Society for the Study of Education, Part II, ed. Helen M. Robinson. Chicago: University of Chicago Press, pp. 30-71.
- Durrell, Donald D., 1958. "First Grade Reading Success Study: A Summary", Journal of Education, Vol. 140, pp. 2-6, 1958.
- Durrell, Donald D., and Murphy, Helen A., 1953. "The Auditory Discrimination Factor in Reading Readiness and Reading Disability", Education, LXXIII, 556-60.
- Dykstra, Robert, 1962. "The Relationship Between Selected Reading Readiness Measures of Auditory Discrimination and Reading Achievement at the End of First Grade", Journal of Reading, IX/5, 311.
- \_\_\_\_\_, 1968. "Classroom Implications of the First Grade Reading Study", Ed. 002 626.
- Edwards, Allen L, 1967. Statistical Methods, Holt, Rinehart & Winston, Inc., New York, 1967.
- Elkind, David, 1969. "Piagetian and Psychometric Conceptions of Intelligence", Harvard Educational Review, XXXIX/2, 319-37.
- Entwisle, Doris P., and Greenberger, Ellen, 1968. Differences in the Language of Negro and White Grade School Children 1-2. Baltimore: Johns Hopkins University Press.
- Feldmann, Shirley, 1966. "A Pre-School Enrichment Program for Disadvantaged Children", Pre-School Education Today, ed. Fred Hechinger. New York: Doubleday & Company, 1966, pp. 97-104.
- Fessler, Janet, 1970. Personal Interview, University School, Hollywood, Florida, October, 1969; February, 1970.
- Filmer, Henty T., and Kahn, Helen S., 1967. "Race, Socio-Economic Level, Housing and Reading Readiness", The Reading Teacher, XXI/a, 153-57.
- Fries, Charles C., 1962. Linguistics and Reading. New York: Holt, Rinehart & Winston, Inc.
- Frost, Joe L., and Hawkes, Glenn R., eds., 1965. The Disadvantaged Child: Issues and Innovations. Boston: Houghton Mifflin.
- Frostig, Marianne, 1966. "The Needs of Teachers for Specialized Information on Reading", The Teacher of Brain-Injured Children, ed. W. M. Cruickshank, Syracuse University Press, pp. 87-110.
- Frostig, Marianne, and Horne, David, 1964. The Frostig Program for the Development of Visual Perception. Chicago: Follett Publishing Company.



## LITERATURE CITED (CONTINUED)

- Gates, Arthur I., and McGinitie, Walter H., 1968. Gates-MacGinitie Reading Tests, Teacher's Manual: Readiness Skills, K and Grade 1. New York: Columbia University Teachers' College Press.
- Geis, R., 1968. La Canada Unified School District Report. California Board of Education, Ed. 030 495.
- Getman, Gerald N., and Hendirckson, Homer H., 1966. "The Needs of Teachers for Specialized Information on the Development of Visuomotor Skills in Relation to Academic Performance", The Teacher of Brain-Injured Children, ed. W. M. Cruickshank, Syracuse University Press, pp. 153-68.
- Gibson, Eleanor; Gibson, James; Pick, Anne; and Osser, Harry, 1962. "A Developmental Study of the Discrimination of Letter-like Forms", Journal of Comparative and Physiological Psychology, LV, 897-906.
- Gibson, J. J.; Pick, Anne; Osser, Harry; and Hammond, Marcia, 1962. "The Role of Grapheme-Phoneme Correspondence in the Perception of Words", American Journal of Psychiatry, LXXV, 1-4.
- Goins, Jean T, 1958. Visual Perceptual Abilities and Early Reading Progress. Supplementary Education Monographs, LXXXVII, Chicago: University of Chicago Press.
- Gordon, E. W., and Wilkerson, Doxey A., 1966. Compensatory Education for the Disadvantaged, New York: College Entrance Examination Board.
- Gotkin, Lassar G., 1968. "Programmed Instruction as a Strategy for Developing Curricula for Disadvantaged Children", Language Remediation for the Disadvantaged Preschool Child, ed. M. Brottman. Monographs of the Society for Research in Child Development, Serial No. 124, XXXVIII/8 (1968), 19-34.
- Gottschalk, Judith; Bryden, M. D.; and Rabinovitch, M. Sam, 1964. "Spatial Organization of Children's Responses to a Pictorial Display", Child Development, XXXV, 811-15.
- Grattan, Paul E., and Martin, Milton B., 1965. "Neuro-Muscular Coordination Versus Reading Ability", American Journal of Optometry (August, 1965), 450-58.
- Hackney, Ben H., Jr., 1968. "Reading Achievement and Word Recognition Skills", The Reading Teacher, XXI, 515-18.
- Hagen, Elizabeth; Thorndike, Robert, 1959. Ten Thousand Careers, New York: Wiley, 1959.
- Harris, Albert J., 1968. "Diagnosis and Remedial Instruction in Reading", Innovation and Change in Reading Instruction, The Sixty-seventh Yearbook of the National Society for the Study of Education, Part II, ed. Helen M. Robinson. Chicago: University of Chicago Press, pp. 159-94.

## LITERATURE CITED (CONTINUED)

- Harris, L. A., 1969. "Interest and the Initial Acquisition of Words", The Reading Teacher, XXII, 312-14.
- Harris, Albert J., and Morrison, C., 1968. "Effects of Kindergarten on the Disadvantaged", The Reading Teacher, XXII, 4-9.
- Harris, Albert J. and Serwer, Blanche L., 1967. "Comparing Reading Approaches in First Grade Reading with Disadvantaged Children", Issues and Innovations in the Teaching of Reading, ed. Joe L. Frost. Chicago: Scott, Foresman & Co.
- Harris, Albert J.; Serwer, B. L.; Gold, L., 1967. "Comparing Reading Approaches in First Grade Teaching with Disadvantaged Children: Extended into Second Grade", The Reading Teacher, XX/8, 698-703.
- Hartford Follow-Through Program, 1969. Hartford Board of Education, Department of Elementary Education. "Follow-Through" Kindergarten: Sequence of Activities, by Joseph D. Randazzo. Hartford, Connecticut (Mimeographed).
- Havighurst, Robert J., 1966. "Who Are The Socially Disadvantaged?", The Disadvantaged Child: Issues and Innovations, ed. Joe Frost and Glenn Hawkes. Boston: Houghton Mifflin, pp. 15-22.
- Hechinger, Fred M., ed. Pre-School Education Today, New York: Doubleday & Company, 1966.
- Henderson, Edmund H., and Long, Barbara H., 1968. "Correlations of Reading Readiness Among Children of Varying Background", The Reading Teacher, XXXV, 517-21.
- Hershoren, A., 1969. "Comparison of the Predictive Validity of the Revised Stanford-Binet Intelligence Scale and the ITPA", Exceptional Children, XXXV, 517-21.
- Hess, Robert D., 1968. "Maternal Behavior and the Development of Reading Readiness in Urban Negro Children", Claremont Reading Conference Yearbook, pp. 83-99.
- Hirst, Wilma E., et al., 1969. Identification in the Kindergarten of Factors That Make for Future Success in Reading and Identification and Diagnosis in the Kindergarten of Potential Reading Disability Cases: Final Report. Cheyenne: Wyoming State Department of Education.
- Holmes, Jack A., and Singer, Harry, 1968. "The Substrata Factor Theory": Substrata Factor Differences Underlying Reading Ability in Known Groups. Los Angeles: University of California Press and U.S. Office of Education.
- Hughes, Earl F.; LaRue, Richard; Yost, Michael Jr., 1969. MANOVA Multivariate Analysis of Variance on Small Computers, Clyde Computing Services, Miami, Florida, 1969.

## LITERATURE CITED (CONTINUED)

- Hurd, Donald E., 1967. A Study of the Relationship Between Reading Achievement and Sense Modality Shifting. Ed. 065 219.
- Hurley, Oliver L., 1968. "Perceptual Integration and Reading Problems", Exceptional Children, XXXV, 207-15.
- Inhelder, Barbel, and Piaget, Jean, 1964. The Early Growth of Logic in the Child, trans. E. A. Lanzer and D. Papert. New York: Norton & Company.
- Jacobs, James N., 1968. "An Evaluation of the Frostig Visual-Perceptual Training Program", Educational Leadership Research Supplement. Cincinnati: Division of Program Development of the Public Schools, pp. 332-40.
- Jensen, Arthur, 1969. "How Much Can We Boost IQ and Scholastic Achievement?" Harvard Educational Review, XXXIX, 1-123.
- John, Vera P., and Goldstein, Leo S., 1967. "The Social Context of Language Acquisition", Disadvantaged Child, ed. J. Hellmuth. Vol. 1. New York: Brunner/Mazel, pp. 455-69.
- Kagan, Jerome S., 1969. "Inadequate Evidence and Illogical Conclusions", Harvard Educational Review, XXXIX/2, 274-77.
- Katz, Irwin, 1967. "The Socialization of Academic Motivation in Minority Group Children", Nebraska Symposium on Motivation, ed. David Levine. Ann Arbor: University of Michigan Press.
- Katz, Phyllis, and Deutsch, Martin, 1963. "Relation of Auditory-Visual Shifting to Reading Achievement", Perceptual and Motor Skills, XVII, 327-32.
- Kephart, Newell C., 1966. The Slow Learner in the Classroom. New York: Charles E. Merrill Books.
- Kershner, John R., 1969. "Children's Spatial Representations", Unpublished paper presented at the American Education Research Association, Los Angeles, California. February, 1969. (Typescript).
- Klaus, Rupert A., and Gray, Susan, 1968. "The Early Training Project for Disadvantaged Children: A Report after Five Years", Monographs of the Society for Research in Child Development, Serial No. 120.
- Kohlberg, Lawrence, 1968. "Early Education: A Cognitive Developmental View", Child Development, XXXIX, 1013-62.
- Labov, W., and Robins, C., 1969. "A Note on the Relation of Reading Failure to Peer Group Status in Urban Ghettos", Record, LXX, 395-405.



## LITERATURE CITED (CONTINUED)

- Lamy, Mary W., 1962. "Relationship of Self-Perceptions of Early Primary Children to Achievement in Reading", ed. D., The University of Florida, 1962. Chairman: Arthur W. Combs, XXIV, No. 2, 628, Journal of Reading, IX/5-33.
- Lang, Mary W., 1962. "Relationship of Self-Perceptions of Early Primary Children to Achievement in Reading", University of Florida unpublished dissertation.
- Langman, Muriel P., 1960. "The Reading Process: A Descriptive, Inter-disciplinary Approach", Genetic Psychology Monographs, LXII, 3-40.
- Lefevre, C. A., 1968. "Simplistic Standard Word-Perception Theory of Reading", Elementary English, XLV, 349-53.
- Llorens, Lela A., et al., 1964. "Cognitive and Perceptual Motor Functions", American Journal of Occupational Therapy, XVIII, 202-8.
- Lyons and Carnahan Program, 1966. Lyons and Carnahan, Inc. Phonics We Use: Book A, Pre-Primer and Primer Levels. Chicago.
- MacGinitie, Walter H., 1967. "Auditory Perception in Reading", Education, LXXXVII, 532-38.
- Marans, Allen E., and Lourie, Reginald, 1967. "Hypotheses Regarding the Effects of Child-Rearing Patterns on the Disadvantaged Child", Disadvantaged Child, ed. Jerome Hellmuth. Vol. 1. New York: Brunner/Mazel, pp. 17-41.
- Marchbanks, Gabrielle, and Levin, Harry, 1965. "Cues by Which Children Recognize Words", Journal of Educational Psychology, LVI/2, 57-61.
- McCloskey, Elinor, 1967. Urban Disadvantaged Pupils: A Synthesis of Ninety-Nine Research Reports. Portland, Oregon: The Northwest Regional Educational Laboratory.
- Menyuk, Paula, 1969. Sentences Children Use. Research Monograph No. 52. Cambridge, Massachusetts: M.I.T. Press.
- Milligan, Jerry L., 1965. A Study of the Effects of a Group Development Program upon the Psycholinguistic Abilities and Later Beginning Reading Success of Kindergarten Children. Seattle: Washington State University Press.
- Minuchin, Patricia, and Biber, Barbara, 1968. "A Child Development Approach to Language in the Preschool Disadvantaged Child", Language Remediation..., ed. M. A. Brottman, Monographs of the Society for Research in Child Development, Serial No. 124, XXXIII/8, pp. 6-18.

## LITERATURE CITED (CONTINUED)

- Montessori, M., 1965. Dr. Montessori's Own Handbook. New York: Schocken Books.
- Mortenson, W. Paul, 1968. "Selected Pre-reading Tasks, Socioeconomic Status, and Sex", The Reading Teacher, XXII/1, 45-61.
- Muehl, Siegmars, 1960. "The Effects of Visual Discrimination Pre-training on Learning to Read A Vocabulary Test in Kindergarten Children", Journal of Educational Psychology, LI/4, 217-21.
- Murphy, H. A., and Durrell, D. D., 1965. Reading Readiness Analysis: Manual of Directions. New York: Harcourt Brace and World, Publishers.
- Nemeth, Joseph S., 1968. "Initial Readiness", The Reading Teacher, XXII, 79-83.
- New York Curriculum, 1968. New York City Board of Education, "Sequential Levels of Reading Skills, Pre-Kindergarten-Grade 12". Brooklyn, N. Y.
- O'Donnell, C. Michael P., 1968. A Comparison of the Reading Readiness of Kindergarten Pupils Exposed to Conceptual-Language and Basal Reader Prereading Programs: A Pilot Study (Final Report). Augusta, Maine: State Department of Education.
- O'Donnell, Roy C.; Griffin, William C.; and Norris, R. C., 1967. "Syntax of Kindergarten and Elementary School Children: A Transformation Analysis". The National Council of Teachers of English Research Report No. 8.
- Olson, Arthur V., 1969. "The Structure of Reading Readiness Ability". Paper presented at the International Reading Association Conference, Kansas City, Missouri, May, 1969.
- Ozer, Mark W., 1968. "The Neurological Evaluation of Children in Head Start", Disadvantaged Child. Vol. 2: Head Start and Early Intervention, ed. J. Hellmuth. New York: Brunner/Mazel, pp. 125-36.
- Panther, Edward E., 1967. "Prediction of First Grade Reading Achievement", The Elementary School Journal, LXVIII, 44-48.
- Piaget, Jean, 1959. The Language and Thought of the Child, trans. M. and R. Gabain. 3d edn. London: Routledge and Kegan Paul.
- \_\_\_\_\_, 1967. Six Psychological Studies, ed. David Elkind. New York: Random House.
- \_\_\_\_\_, and Inhelder, B., 1956. The Child's Conception of Space. London: Humanities Press.



## LITERATURE CITED (CONTINUED)

- Plack, Jeralyn J., 1968. "Relationship between Achievement in Reading and Achievement in Selected Motor Skills in Elementary School Children", The Research Quarterly, XXXIX/4, 1063-68.
- Powledge, Fred, 1967. To Change a Child: A Report on the Institute for Developmental Studies. New York: Quadrangle Books.
- Raab, S.; Deutsch, M.; and Freedman, A. M., 1960. "Perceptual Shifting and Set in Normal School Children of Different Reading Achievement Levels", Perceptual and Motor Skills, X, 187-92.
- Reed, David W., 1965. "A Theory of Language, Speech, and Writing", Elementary English, XLII, 845-51.
- Resnick, Lauren B., 1967. Preschool Curriculum. Pittsburgh: University of Pittsburgh Learning Research and Developmental Center.
- Reynolds, R. J., and Palmatier, R. A., 1969. "The Effects of Input on the Reading Process", Journal of Reading Behavior, I/23, 15-23.
- Riessman, Frank, 1962. The Culturally Deprived Child. New York: Harper and Row, 1962.
- Blueprint for the Disadvantaged. New York Anti-Defamation League of B'nai B'rith. No date
- Rudnick, Graham, 1967. "Auditory and Visual Rhythm Perception and Reading Ability", Child Development, Junr, 1967.
- Salome, Richard A., 1968. "Perceptual Training in Reading Readiness and Implications for Art Education", Studies in Art Education, X (1968), 58-67.
- Scott, Ralph, 1968. "Perceptual Readiness as A Predictor of Success in Reading Seriation Test", The Reading Teacher, Vol. 22, 1968, pp. 36-39.
- Scott, L. T. "Reading Readiness - Month-by-Month", The Grade Teacher, LXXXV.
- Shea, C. A., 1968. "Visual Discrimination of Words and Reading Readiness", The Reading Teacher, Vol. 21. January, 1968, pp. 361-67.
- Shumard, C. H., 1968. "Reading and Visual Perception", Ohio Schools, XLVI (1968), 23-24.
- Shuy, Roger W. "Some Considerations for Developing Beginning Reading Materials for Ghetto Children", Journal of Reading Behavior, Vol. 1, No. 2, 1969, pp. 33-43.
- Siegel, Irving E, and McBane, Bonnie. "Cognitive Competence and Level of Symbolization Among 5-year old Children", Disadvantaged Children. Vol. III.

## LITERATURE CITED (CONTINUED)

- Silberberg, Norman E., 1968. "Predictive Efficiency of the Gates Reading Readiness Tests", The Elementary School Journal, January, 1968, Vol. 68, pp. 213-18.
- \_\_\_\_\_, 1968. "The Effects of Kindergarten Instruction in Alphabet and Numbers on First Grade Reading".. Kenny Rehabilitation Institute, Minnesota.
- Spache, George D.; Andres, Micaela C.; Curtis, H. A.; Rowland, Minnie Lee; and Field, Minnie Hall. "A Longitudinal First Grade Reading Readiness Program", Issues and Innovations in the Teaching of Reading, ed. Joe Frost. Chicago: Scott, Foresman and Co., 1967.
- Stauffer, R., 1968. "Beginning Reading: More than Decoding", Instructor, LXXVIII (1968), 113-14.
- Stern, Carolyn, 1968. "Systematic Instruction of Economically Disadvantaged Children in Pre-reading Skills", Claremont Reading Conference Yearbook, XXXII (1968), 100-107.
- Sterritt, Graham M., et al., 1968. Sequential Pattern Perception and Reading, Paper presented at International Reading Association Conference, Boston, Massachusetts. April 24-27, 1968.
- Strodbeck, Fred L., 1964. The Reading Readiness Nursery: Short-Term Social Intervention Technique.
- Stodalsky, Susan S., and Lesser, Gerald, et al., 1967. "Learning Patterns in the Disadvantaged", Harvard Educational Review, XXVII, 546-593.
- Sullivan, Linguistic Reading Series, 1968. Palo Alto, California, Behavioral Research Laboratories. 1968.
- Taylor, Raymond G, and Nolde, S. Van L., 1969. "Correlative Study Between Reading, Laterality, Mobility, and Binocularity", Exceptional Children, Vol. 35, 1969. pp. 627-31.
- Taylor, S. E., Frackenpohl, H., and Mallis, J. Teacher's Guide: Listening Programs. New York Educational Developmental Laboratories, McHill, 1968.
- Third Mental Measurements Yearbook, Editor, Oscar Krisen Buros, Rutger University Press, 1949.
- Veldman, Donald J., Fortran Programming for the Behavioral Sciences. Holt, Rinehart & Winston, New York. 1967.
- Vygotsky, L., 1962. Thought and Language, New York: John Wiley & Sons, 1962.

## LITERATURE CITED (CONTINUED)

- Walters, Jas.; Connor, Ruth; and Zunich, Michael, 1964. "Interaction of Mothers and Children from Lower-Class Families", Child Development, XXXV (1964), 433-40.
- Webster, Staten W., 1969. "Research in Teaching Reading to Disadvantaged Learners: A Critical Review and Evaluation of Research", Research in Education. Washington, D.C.: Office of Education (HEW), IV/4 (1969).
- Weikart, David P., et al., 1967. "Penny Pre-School Report", Progress Project. Ypsilanti, Michigan: Ypsilanti Public Schools, 1967.
- Weiner, Max, and Feldmann, Shirley, 1963. "Validation Studies of a Reading Prognosis Test for Children of Lower and Middle Socio-economic Status", Educational and Psychological Measurement, XXIII (1963), pp. 807-814.
- Weingart, Roger, 1968. The Reading Teacher, XXII, 325-28.
- Wheelock, W. H., and Silvaroli, N. J., 1967. "Visual Discrimination Training for Beginning Readers", The Reading Teacher, XXI (1967), 114-20.
- Wiener, Morton, and Cromer, Ward, 1967. "Reading and Reading Difficulty: A Conceptual Analysis", Harvard Educational Review, Vol. 37, #4, 1967 pp. 620-643.
- Williams, J. P., and Levin, Harry, 1967. "Word Perception" Psychological Bases", Education, LXXXCII (1967), 515-18.
- Witteck, Mildred Letton. Innovations In Reading Instruction for Beginners. • Innovations and Changes in Reading Instruction, Part II, ed. by Helen M. Robinson, University of Chicago Press, 1968.
- Wynn, S. J., 1967. "A Beginning Reading Program for the Deprived Child", The Reading Teacher, XXI (1967), 40-47.