POSSIBLE INHIBITING FACTORS RELATED TO THE READING ACHIEVEMENT OF SELECTED CLINICAL SUBJECTS

A thesis submitted in partial satisfaction of the requirements for the degree of Master of Arts in Elementary Education, Reading Improvement

by

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DEDICATION

This study is dedicated to all those children who have suffered the agony of being a disabled reader. If what is contained within these covers contributes enough to help just one disabled reader, then this endeavor was worth the time, the energy, and the sacrifice given to it.
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ABSTRACT

POSSIBLE INHIBITING FACTORS RELATED TO THE READING ACHIEVEMENT OF SELECTED CLINICAL SUBJECTS

by

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The purpose of this study was to determine if variance in reading achievement of selected clinical subjects was related to possible inhibiting causes of reading disability.

The cumulative records of the 73 students who attended the Camarillo Reading Clinic 1976 summer sessions were assembled. Test results from a battery of tests administered during the initial diagnosis of these students were inserted into the Bond/Clymer reading expectancy formula. This process eliminated 26 students and left a total of 47 students to be included as subjects for the study.

Using a case study approach and drawing ex post facto from available data, a study was made of the subjects to assess their physical, psychological, socioeconomic, and educational development, IQ, and reading achievement scores.
A mean point gain was determined for the subjects with a specific anomaly and for the subjects without the same, specific anomaly. The two means were compared. In each instance the hypothesis was accepted when the anomaly group mean was lower and was rejected when the anomaly group mean was higher.

The findings of the study generally supported the literature. Certain anomalies appear to have more of an effect on reading achievement indicating a relationship between the importance of inhibiting factors and reading achievement.
Chapter 1

THE PROBLEM AND DEFINITION OF TERMS

INTRODUCTION

Numerous articles have appeared in newspapers, professional journals, and reading texts as to the existence of reading difficulties of school children. The extent of these difficulties is not precisely known. Strang (1969) states:

Estimates of the frequency of reading disabilities vary greatly depending upon the definition, the population sampled, the tests used, the statistical methods employed, and the investigator's interpretation. In general, estimates range from 10 to 25 percent of the school population. (p. 3)

Various authorities who estimate that at least ten percent of the elementary school population has some degree of developmental dyslexia were cited by Zintz (1972). Bond and Tinker (1973) cite various authorities who estimate that eight to fifteen percent of the school population have varying degrees of reading disability. It was found by Austin, Bush, and Huebner (1961) that approximately sixteen percent of children in grades three to nine were in need of special help in reading. These reports and estimates have caused concern among school administrators and spawned various methods of teaching reading, the latest of which is the reading management system.
However, such systems are mainly concerned with determining weaknesses in reading achievement. Reading management systems purport to be diagnostic/prescriptive in nature, but, in fact, merely test strengths and weaknesses in reading skills and base the prescription on remediating weaknesses (see Appendix A). At no time do such systems attempt to identify the possible causes of reading disability which, ideally, should be an integral aspect of diagnosis. While a management system may be adequate for average students in the classroom, it is not sufficient for disabled readers.

Addressing diagnosticians and remedial reading teachers who wish to be effective, Ekwall (1976) states: "You must have a broad knowledge of causal factors in reading disabilities. A number of factors have a significant correlation with reading disability..." (p. xi). In effect, more attention should be directed toward determining possible causes of reading disability rather than merely remediating the symptoms of disabled readers.

STATEMENT OF THE PROBLEM

The purpose of this study was to determine if variance in reading achievement of selected clinical subjects was related to possible inhibiting causes of reading disability.
LIMITATIONS OF THE STUDY

This study was limited to an analysis of physical, psychological, socioeconomical, and educational history, diagnostic reading evaluations, and final test results of selected students enrolled in a private reading clinic.

Information pertaining to physical, psychological, socioeconomical, and educational history was taken from the Child Study Form (see Appendix B). This form was completed by the parent(s) which further limits this study to that information which the parent(s) was willing to share. However, this information was often augmented by a conference between the director and the subject's present and/or previous teachers and was sometimes augmented by reports from specialists outside the clinic (pediatricians, speech therapists, optometrists, psychologists, etc.).

The subjects were limited to those who were financially able to attend a private reading clinic.

The results were reported in a non-statistical form and are, therefore, tentative.

HYPOTHESES

The purpose of this study was to test the following research hypotheses:

1. Reading achievement in the clinical program will be inhibited by visual acuity anomaly of the subject.
2. Reading achievement in the clinical program will be inhibited by visual perception anomaly of the subject.

3. Reading achievement in the clinical program will be inhibited by auditory acuity anomaly of the subject.

4. Reading achievement in the clinical program will be inhibited by auditory discrimination anomaly of the subject.

5. Reading achievement in the clinical program will be inhibited by chronic physical anomaly of the subject.

6. Reading achievement in the clinical program will be inhibited by the male sex of the subject.

7. Reading achievement in the clinical program will be inhibited by motor development anomaly of the subject.

8. Reading achievement in the clinical program will be inhibited by language development anomaly of the subject.

9. Reading achievement in the clinical program will be inhibited by neurological anomaly of the subject.

10. Reading achievement in the clinical program will be inhibited by motor coordination anomaly of the subject.
11. Reading achievement in the clinical program will be inhibited by speech anomaly of the subject.
12. Reading achievement in the clinical program will be inhibited by the lower intelligence quotient of the subject.
13. Reading achievement in the clinical program will be inhibited by self-concept anomaly of the subject.
14. Reading achievement in the clinical program will be inhibited by the lower educational level of the parents of the subject.
15. Reading achievement in the clinical program will be inhibited by the lower economic level of the parents of the subject.
16. Reading achievement in the clinical program will be inhibited by the lack of support for schools by the parents of the subject.
17. Reading achievement in the clinical program will be inhibited by the lack of exposure to reading of the subject within the home.
18. Reading achievement in the clinical program will be inhibited by the ordinal position of the subject within his family other than first born or only child.
19. Reading achievement in the clinical program will be inhibited by rivalry between the subject and his siblings.
20. Reading achievement in the clinical program will be inhibited by the large family size of the subject.

21. Reading achievement in the clinical program will be inhibited by the marital instability of the parents.

22. Reading achievement in the clinical program will be inhibited by the lack of a Kindergarten experience.

23. Reading achievement in the clinical program will be inhibited by a change of schools in the primary grades by the subject.

24. Reading achievement in the clinical program will be inhibited by absenteeism of the subject.

25. Reading achievement in the clinical program will be inhibited in proportion with the number of anomalies identified with the subject.

JUSTIFICATION OF THE PROBLEM

There is general agreement among reading specialists that diagnosis of the disabled reader must proceed beyond testing of strengths and weaknesses in reading achievement and that it should investigate possible inhibiting factors of reading disabilities. Ekwall (1976) states that "remedial procedures... are of less value than they might have been if some precautions had been taken to alleviate conditions or factors that caused the reading disability in the first place" (p. 1). There is concurrence by Schubert
and Torgerson (1972) who state that teachers should be alert to possible causal factors and do what they can to minimize these factors as soon as they are determined.

In a more emphatic manner, Spache (1976a) states:

Diagnosis is eclectic and thorough. All basic etiological areas must be covered to obtain the total picture of the development of the disability. The process requires much more than an assessment of reading skills because difficulties with these may be symptomatic of a wide range of causative factors (Pumfrey). This principle implies the collating of information from schools, parents, agencies working with the family, the pupil's health history, and developmental history, as well as analytic testing in the areas of vision, hearing, personality, and intelligence. (pp. 9-10)

DEFINITION OF TERMS

The following definitions will be used in this study:

**Diagnostic/Prescriptive Approach.** A system of teaching reading which includes a thorough diagnosis of reading strengths and weaknesses, an investigation of possible inhibiting factors, and an individual plan for remediation based on the diagnosis.

**Diagnosis.** An intensive analysis and description of a reading disability including strengths and weaknesses in reading skills as well as underlying inhibiting factors to provide a basis for remediation.

**Prescription.** A plan for remediation of weaknesses in reading skills and of alleviating possible inhibiting factors while building on strengths.
Disabled Reader. an individual whose reading achievement is below his expectancy level by one year or more if in the primary grades, or by two years or more if older.

Expectancy Level. reading expectancy grade scores calculated by the Bond and Clymer formula (I.Q. times years in school plus 1.0 equals reading expectancy).

Inhibiting Factors. conditions and practices which may contribute to reading disability.

Physical Factors. physical anomalies, deficiencies, or conditions which may contribute to reading disability, such as visual and auditory acuity anomalies, visual and auditory discrimination anomalies, chronic physical anomalies, sex, motor development anomalies, language development anomalies, neurological anomalies, motor coordination anomalies, and speech anomalies.

Visual Discrimination. the process of comparing similarities and differences in graphic symbols.

Auditory Discrimination. the ability to hear major or slight differences in sound.

Chronic Physical Anomalies. physical inadequacies which are contributory factors rather than factors that cause reading disability, such as glandular dysfunction, asthma, allergies, loss of sleep, heart trouble, tuberculosis, sinus trouble, rheumatic fever, or any prolonged illness which could cause discomfort.

Neurological Anomalies. deviations in the functioning of
the central nervous system which are caused by pre- and postnatal injuries, difficult pregnancy and birth, malnutrition, and thyroid abnormalities and can be responsible for hyperactivity and deficits in perception, conceptualization, language, or memory.

**Psychological Factors.** intellectual and emotional difficulties or conditions which may contribute to reading disability.

**Socioeconomic Factors.** home and social environmental conditions which may contribute to reading disability.

**Marital Stability.** a family that has not experienced separation, divorce, death of a parent, or excessive arguing.

**Educational Factors.** school conditions and practices which may contribute to reading disability.

**Absenteeism.** at least ten days absence from class during a school year.

**Reading Clinic.** a private reading center which employs a team of reading therapists and provides diagnostic testing services and individualized instruction using a diagnostic/prescriptive approach.

**Reading Therapist.** a reading specialist who provides diagnosis and remediation for the more complex and severe reading disability cases and whose training consists of at least a Bachelor's Degree plus 30 graduate hours in reading and related areas and 50 to 100 hours of specialized training at CRC.
CRC. Camarillo Reading Clinic, located at 397 Mobil Avenue, Suite 2A, Camarillo, California, which was the location of this study.

Inhibited. the average gain of those subjects with anomaly will be less than those subjects without the anomaly.

SUMMARY

According to various authorities, from eight to twenty-five percent of the children within the school population have some degree of reading disability. These reports have led to various methods of teaching reading, the latest of which is the reading management system. Reading management systems test strengths and weaknesses in reading skills but do not address themselves to possible causes of reading disability. In general, reading experts agree that reading diagnosis should attempt to identify possible causes of reading disability, such as physical, psychological, socioeconomical, and educational factors.

This study described the concomitant inhibiting factors related to the reading achievement of selected clinical subjects.
Chapter 2

REVIEW OF THE LITERATURE

INTRODUCTION

This study was initiated to determine if variance in reading achievement of selected clinical subjects was related to possible causes of reading disability. The previous chapter presented the intent, rationale, and limitations of the study. Certain terms were defined in order to facilitate the reader's understanding of the most important terms and the terms most commonly utilized. Chapter 2 presents a review of literature on the possible causes of reading disability and the history and model of reading clinics.

CAUSES OF READING DISABILITY

Causal factors in reading disability can be defined as "the conditions and practices responsible in whole or in part for reading disabilities" (Schubert, 1969, p. 50). These causal factors may be either physical, psychological, socioeconomical, or educational or a combination of some or all of them.

Various authorities have suggested that determining causal factors be a part of reading diagnosis (Ekwall, 1976; Schubert and Torgerson, 1972; Spache, 1976a). However, for
this information to be useful, it should be decided in ad-
vance as to what factors to look for. Sometimes, serren-
dipidous findings may lead to dilemmas. For example,
Robinson (1946) tested for dominance and found areas of mix-
ed dominance, but "dominance was not included among the
causes of reading disability because the group of special-
ists cooperating in this study were unable to interpret the
test results" (p. 230).

The quest of possible causal factors can be an elu-
sive endeavor as there is no single cause of reading dis-
ability (Robinson, 1946; Bond and Tinker, 1973; Ekwall,
1976). "The contributing factors interact as part of a pat-
tern" (Bond and Tinker, 1973, p. 157). Additionally, the
wealth of possible causes can, in itself, be a hindrance.
Seven major categories were named by Robinson (1946) and
Spache (1976b), while Cornelius (1972) named five major
categories for investigation. Each major category includes
many subcategories too numerous to mention. To further
complicate matters, the experts do not agree on the basis
for categorization. Some created separate categories for
intelligence and neurology and placed auditory and visual
perception in the physical domain while others placed them
under psychology. To facilitate matters, the first four
categories of Ekwall's (1976) model were utilized in this
study. They are Physical Factors, Psychological Factors,
Socioeconomic Factors, and Educational Factors. (His fifth
and last category is called: Combinations of the four major categories listed above.)

In a study described as monumental and most comprehensive and referred to by many of the authors reviewed, Robinson (1946) enlisted the aid of a social worker, a psychiatrist, a pediatrician, a neurologist, three ophthalmologists, a speech specialist, an otolaryngologist, an endocrinologist, and a reading specialist. Robinson acted as psychologist and reading technician.

Thirty severely retarded readers were examined by these specialists. Possible causes of reading disability were identified, and 22 of the 30 subjects were placed in an intensive remedial program in order to secure evidence of the potency of each of these possible causes.

Detection of probable causes of reading disability involved three steps: (1) The subjects were tested and examined by all the specialists. After the initial examination, the specialists attended a conference and the anomalies demonstrated by each subject were listed and tallied. (2) The specialists conferred and attempted to evaluate these anomalies and to identify possible causes of reading disability operating in each case. (3) Anomalies were considered causal when reading improvement resulted from its correction.

Robinson concluded that: (1) Those most seriously retarded evidenced the greatest number of anomalies,
whereas those least retarded presented fewest, (2) Certain of the anomalies had no direct relationship to the reading deficiency, (3) A number of the anomalies that appeared to be possible causes did not prove to be so, and (4) Certain types of anomalies operated as causes more frequently than others.

She found that social, visual, and emotional difficulties appeared most frequently as causes of poor progress or failure in learning to read. Inappropriate instructional methods, neurological difficulties, and speech or functional auditory difficulties appeared less frequently as causes of deficient reading. Endocrine disturbances, general physical difficulties, and insufficient auditory acuity appeared to be least important, in so far as they contributed infrequently to reading failure among the particular children included in the study.

Physical Factors

This section will review the role of various physical anomalies as contributing causes of reading disability. Discussion will include visual and auditory deficiencies, chronic physical problems, developmental delay, and neurological difficulties.

Visual Acuity. Visual acuity refers to sharpness of vision. It is a function of the physical aspects of the visual system. Some visual disorders which contribute to a deficiency
in visual acuity are astigmatism, myopia, hyperopia, binocular vision, and fusion.

Various authorities stated that from 20% to 82% of students are in need of lens correction (Bond and Tinker, 1973; Spache, 1976b; Schubert and Torgerson, 1972). In her study of 488 subjects identified as dyslexics, Klasen (1972) found that 32% were inflicted with impaired vision.

The exact relationship between lack of visual acuity and reading disability is not known. "... the research evidence regarding the interaction of vision and reading is conflicting and often confusing" (Spache, 1976b, p. 45).

There is concurrence from Schubert and Torgerson (1976):

On casual inspection one would expect to find a marked positive relationship between visual defects and reading skills because reading of printed symbols involves the eyes. But the literature is not conclusive. Some investigators find that visual defects contribute to reading failure while others do not. (p. 37)

The conflict and confusion can be attributed to various factors, one of which is the individual's attitude toward his visual anomaly. According to Betts (1952):

A visual problem may interfere with reading or contribute to a withdrawal from reading situations. The effect of a visual anomaly upon reading depends upon both the nature of the visual problem and the individual's capacity to compensate. (p. 630)

Harris (1970) concurred:

People differ in their ability to adapt themselves to handicaps. A relatively slight visual defect may give one person acute discomfort while another person with a more severe defect may not be bothered by it. (p. 251)
After reviewing the literature, Spache (1976b) stated that "the very same dysfunction to the same degree may seriously retard one child and have no apparent effect upon another" (p. 47). It was reported by Eames (1962) that "one child might be greatly handicapped by a visual defect while another might perceive adequately on the basis of very poor retinal images" (p. 429). Robinson (1946) found that visual anomalies may be coincidental or causal.

Another factor contributing to the conflict and confusion is the vision test used. According to Spache (1976b) vision tests do not yield precisely the same indications.

The most widely used and most criticized school vision test is the Snellen Chart (Spache, 1976b; Bond and Tinker, 1973; Malmquist, 1965; Bixel, 1966). Two specific criticisms are that the Snellen Chart does not detect deficiency of near-point, or reading distance, which is about 14 inches, and is at a disadvantage in measuring monocular vision.

The proper use of vision tests was discussed. According to Keeney (1969):

... any screening instrument does not take the place of professional eye care but should be thought of as an assisting device used to identify individuals needing care on the basis of a few salient points. (p. 201)

Harris (1970) added that the discrepancies between research and fact is that the subjects and vision tests employed are frequently not directly comparable. In Smith's (1969) view:
Even the most sophisticated and carefully performed tests are neither final nor absolutely conclusive. In doubtful cases, it is my practice to repeat tests on different instruments and at different times. It is not unusual to obtain variable findings when performed in such a manner. However, when results are repeatedly and relatively compatible, it is safe to draw conclusions as to probable complicity. (p. 148)

Primarily, poor research appears to be responsible for the conflict and confusion (Flax, 1970). Schubert and Torgerson (1972) cite an authority who discusses a number of factors which investigators have not held constant: age of subjects, readiness to learn to read, and methods and quality of teaching.

Considering the inconsistencies in research regarding visual anomalies as a possible cause of reading disability, authorities agreed that children who are found to have defective vision should be sent to an eye specialist (Harris, 1970). It was pointed out by Schubert and Torgerson (1970) that poor vision is never an asset even if not a causal factor, and Robinson (1946) suggested that good readers with visual anomalies might read better or with less discomfort if these anomalies were corrected. Dechant (1970) concurred when he stated that good vision will mean more comfortable reading. He continued with a discussion of a specific anomaly which can cause the reader to expend enough energy so as to lead to early fatigue.

**Visual Perception.** "A child may have perfect vision but imperfect visual perception" (Schubert and Torgerson, 1970,
p. 317). This phenomenon can be seen in Klasen's (1972) study. She found that whereas only 32% of 488 dyslexics exhibited impaired vision, nearly 40% of the subjects exhibited visual perception problems. Robeck and Wilson (1974) stated that "visual perception in reading is the process of comparing similarities and differences in graphic symbols" (p. 262).

In a review of 80 studies concerned with visual perception, Hammill (1972) found that the terms "visual perception" and "visual discrimination" were used interchangeably.

The development of visual perception begins long before the child is ready to read but has a direct relationship to reading. Newborn infants can discriminate between triangles and other geometric forms (Cratty, 1970). The relationship between this infantile discrimination and reading can be seen when Schubert and Torgerson (1970) stated that a child's ability to discern similarities and differences between words that are alike in configuration depends on his previous success in more concrete perceptual settings.

The latter two authors continued with developmental stages. They stated that development then proceeds to eye-hand coordination which helps refine the perception of a space relationship. These authors suggested that when an infant is reaching for something, the infant is experiencing a concrete example of distance. Strang (1969) concurred
that visual perception is built on sensorimotor experiences. "From innumerable small experiences the basic associations are formed that make systematic discrimination easy and natural" (Robeck and Wilson, 1974, p. 230).

With some children this developmental sequence is interrupted and difficulties arise (Schubert and Torgerson, 1970). Some factors contributing toward these interruptions, according to Kephart (1960), are environmental deprivation, injuries, defects in the organism, or emotional difficulties. A child thus affected may demonstrate difficulty in perceiving the detailed image of a word.

According to Zintz (1975) the beginning reader relies on gross differentiations, such as length of words, ascenders (the letters -h and -k, etc.), and descendents (the letters -g and -j, etc.). It was also argued by Robeck and Wilson (1974) that when children begin to read, they expend more time and energy discriminating between differences among letters and words.

"Prominent among the perceptual tendencies of immature children is the tendency to make reversal errors. To such children b, d, p, and q are the same" (Harris, 1970, p. 27). Reversals may be reversing whole words, rearranging letters within words, confusing word configuration, rearranging whole phrases, and interchanging letters (Zintz, 1972). A tendency to commit reversals is usually considered a problem of laterality. In the opinion of
Harris and Sipay (1971), "When reversals are prominent in a child's reading and spelling, there is likely to be a basic directional confusion" (p. 403).

Reading is a left to right activity which is a new concept for children. Laterality is not a common experience of their everyday perceptions. Things and animals look the same whether the eye movement is from left to right or right to left (Dechant, 1970). A child's stuffed toy is the same stuffed toy even if it is upside-down, right-side up, in the toy box, or caught on a limb in the tree behind the house.

Many authors offered many suggestions for remediating the problem of reversals. Almost all the suggestions were techniques in teaching laterality.

A note of caution was offered by Robeck and Wilson (1974) regarding this practice. They stated that while reversals are usually blamed on laterality, actually, discrimination of words and letters should be taught. They told the story of John who visualized -b and -d but was unable to remember which was which. His problem was labeling.

Reversals and their consequences have been studied for quite some time. In a unique study Rock (1966) reviewed Stratton (1897) who studied inversion by wearing a lens that turned his visual field upside down and reversed left to right. Stratton concluded that inversion could be completely overcome with time. Teegarden (1932) and Davidson
(1935) concluded that while children with reversal problems make less than normal progress in first grade, these reversals tend to decrease as the children get older. In 1954 Kennedy concluded that while children exhibited a high percentage of reversals in kindergarten, they all but disappeared by the third grade.

In his review of 80 visual perception studies, Hammill (1972) concluded that "training visual perceptual skills, using currently available programs, has no positive effect on reading and possibly none on visual perception" (p. 559). In another review Pitcher-Baker (1976) reviewed 20 studies which concluded that no relationship existed between perceptual training and reading achievement.

"Because of the great amount of color used in pictures and in all teaching media today, the child who is color-blind has a distinct disadvantage" (Zintz, 1975, p. 179). Zintz cited authorities who stated that about 4% of the school population is color-blind and studies which show significant differences in reading achievement when comparing color and non-color-blind students in the first grade. Spache (1976a) stated that color discrimination is significant for reading diagnosis because of the demand for these discriminations in primary reading and seatwork.

The review of the literature for this study revealed no studies concerning color-blindness above the first grade. This is probably due to the fact that reading systems which
employ color coding are usually restricted to the pre-reading, reading readiness, and first-grade reading stages.

Auditory Acuity. Auditory acuity refers to the functional efficiency of the hearing apparatus (Robeck and Wilson, 1974). It is the ability to hear sounds of varying pitch (frequencies or vibrations) heard at different degrees of loudness (measured in decibels).

Frequency refers to pitch or tone, such as the sounds heard when different keys of a piano keyboard are engaged. High notes would represent the high frequency, low notes the lower frequency. Decibels refer to loudness; the higher the decibel count, the louder the sound.

The human ear is sensitive to frequencies ranging from 20 to 20,000 cycles per second (cps) (Dechant, 1970). The normal range is between 125 and 8,000 cps, with most in the 130-4,000 cps range (Ekwall, 1976).

Bond and Tinker (1973) cited a study that indicated 25% of 288 children showed loss at high frequencies. Furthermore, they cited studies which reported from 3% to 20% of children with hearing deficiencies with a median of 10%. They stated that approximately 5% of the school population have serious hearing impairment.

According to these same two authors, "Children with high tone deafness at frequencies above 500 to 1,000 cycles are handicapped in learning to read" (p. 121). The child suffering loss of hearing in certain high frequency ranges
is handicapped in that "a large proportion of the consonant sounds are found among the high tones" (Kasdon, 1971, p. 27). Bond and Tinker (1973) argued that these consonants are those "which lend intelligibility to words" (p. 121). With support from various authorities, Spache (1976b) stated:

Losses in acuity that involve the high tones affect the learner's ability to deal with consonant sounds and blends, although he retains the ability to hear vowel sounds. It is apparent that such children are severely handicapped in responding to the usual phonic sequence that begins with an emphasis upon consonants, blends, digraphs... In low-tone losses, the child has difficulty with vowel sounds and with r, g, b, h, and their blends. Since the words of the primary reading vocabulary (and most words) are not distinguished so much by their vowels as by their consonant sounds, low-tone losses are not a great obstacle to learning to read. (p. 90)

Ekwall (1976) also stated that losses in the high frequency range are more likely to result in reading retardation than in other ranges. When discussing the case of a severely retarded reader, Harris and Sipay (1975) found that it was probable that the child's inability to hear high frequency sounds was the cause of his inability to pronounce them well and resulted in confusing him in reading because words that sounded alike to him had different letters in them and different meanings.

"There is some evidence that children with high frequency loss tend to fail in the primary grades" (Kasdon, 1971, p. 27). It was pointed out by Robeck and Wilson (1974) that women's voices are in the high frequency ranges,
and primary teachers are usually women.

Normal conversation is measured at approximately 60 decibels (Bond and Tinker, 1973). Dechant (1970) found that normal acuity is variously defined. Some say a loss of 6 decibels puts one in the hard of hearing group while others say a loss of 15 decibels does. According to Ekwall (1976) a loss up to 5 decibels is normal, a loss of 6-10 decibels would result in slight hearing difficulty, and a loss of 11-15 decibels would result in considerable difficulty. As reported by Bond and Tinker (1973) normal hearing includes loss of from 6-15 decibels. It was argued by Harris and Sipay (1975) that a loss of over 25 decibels is almost certain to handicap a child in hearing in classroom situations.

Ekwall (1976) cited studies which indicated that more cases of impaired auditory acuity were found among groups of retarded readers than among groups of average or good readers. Dechant (1970) reported that retardation is more evident among children with defective hearing than among those children with normal hearing.

While hard of hearing students tend to be educationally retarded, in general, the hearing ability of school children tends not to be correlated with reading ability (Harris and Sipay, 1975). Lack of auditory acuity was found to be relatively unimportant as a cause of severe reading retardation (Robinson, 1946). She found it to be a cause
of poor reading in only 9% of her cases.

It appears that "as with defective vision, the handicapping effect of a partial hearing loss is much greater for some people than for others" (Harris and Sipay, 1975, p. 288).

**Auditory Discrimination.** While being able to hear is obviously important, normal acuity does not presume good auditory discrimination (Dallman, et. al., 1974). A child may have normal acuity but still have difficulty in perceiving differences between speech sounds (Harris and Sipay, 1971).

It was maintained by Bamman, et. al. (1973) that while auditory acuity is in the normal range and the child may hear gross distinctions, he may not be able to discriminate between the subtle differences of the phonemes of the language.

Auditory discrimination is the ability to hear major or slight differences in sounds (Ekwall, 1976). A more definitive definition is advanced by Robeck and Wilson (1974):

> Auditory discrimination is the process of comparing similarities and differences in auditory stimuli. . . . Auditory discrimination involves the identification of a pattern of sounds as a configuration against a generalized background of auditory stimulation. (p. 201)

Children who suffer from poor auditory discrimination is estimated by some authorities to be between 1-1/2% to 3-1/2% while others estimate that 30% of the girls and
50% of the boys suffered from it (Dallman, et al., 1974). Dechant (1970) reported, "... approximately 20% of the normal speaking population has poor auditory discrimination" (p. 179).

Some authorities feel that auditory discrimination is a developmental skill based upon the maturational progress of the auditory process. According to Dechant (1970) maturation of the skill is gradual and is very seldom fully developed by eight years of age. Studies concerning auditory discrimination were interpreted by Spache (1976b) to imply that this skill is not completely developed until 8 or 9 and that discriminatory inaccuracies are not so much a defect as they are a reflection of the child's rate of development. A longitudinal study of 105 children in which the investigator found that poor auditory discrimination rather than normal discrimination is the rule for first grade students was discussed by Ekwall (1976). The investigator found the opposite true at the end of second grade.

Others feel that the skill can be improved with training. Karlin (1975) stated that "it has been demonstrated that auditory discrimination abilities will improve with training" (p. 105). Spache (1976b) concluded that training in this skill may improve it.

Development of auditory discrimination strongly affects a child's ability to learn to read (Bamman, et al., 1973). Robeck and Wilson (1974) maintained that "auditory
discrimination of phonemes usually emerges as one of the most important factors in reading success" (p. 215). Other authorities also stressed the importance of the effect of auditory discrimination upon reading achievement (Harris and Sipay, 1975; Dechant, 1970; Dallman, et. al., 1974; Kasdon, 1971; Ekwall, 1976). Ekwall adds that the ability to mask (the ability to discern a certain sound when interfering sounds or noises are present) is important. It is felt that unless the reader can discriminate the many sounds that form words, he will not be able to associate the spoken sound and the graphic symbol (Dechant, 1970).

Numerous studies that were conducted between 1953 and 1971 demonstrated that auditory discrimination is significantly related to reading achievement (Karlin, 1975). Further support for this view can be found in Dallman, et. al. (1974).

There are others who refute the above. Spache (1976b) maintained that while difficulty with auditory discrimination appears to be more important in the primary grades, it plays a very minor role in early reading success. In a summary of research on auditory discrimination from the 1930's to the 1960's, Dykstra (1966) found low to moderate correlations with first grade reading achievement. In his own study of 632 subjects he found correlations between auditory discrimination and reading achievement to be uniformly low with few reaching .40.
It seems that the importance of this skill varies with the method of reading instruction utilized by the teacher. "The problem will not be a severe one if the instructional program does not require children to depend solely on auditory discrimination" (Karlin, 1975, p. 105). For a phonics program Spache (1976b) felt that auditory discrimination is important. Harris and Sipay (1975) argued that it is important to develop auditory discrimination ability before phonics instruction. Authorities who stated that if a student can't discriminate the differences between sounds, his foundation for phonics instruction is inadequate were cited by Dechant (1970).

Instruction for improving auditory discrimination with the intention of improving reading achievement has aroused various reactions. Dechant (1970) cited authorities who found an improvement in reading achievement after auditory discrimination training. However, Harris and Sipay (1975) thought it doubtful that training increases reading achievement. After reviewing numerous studies, Spache (1976b) concluded that training in auditory discrimination may improve auditory discrimination but not necessarily reading achievement.

Chronic Physical Anomalies. When considering physical problems in relation to reading disability, Dechant (1970) advised caution:
Generally, physical inadequacies are contribu­tory factors rather than factors causing reading problems. . . . Any physical inadequacy makes it difficult to become enthusiastic about learning and may result in lowered vitality, in depletion of energy, in slower physical development, and hence in mental retardation. Physical inadequacies cause the child to center attention on them and away from learning. . . . The malnourished child does not have the energy to be an effective learner. (p. 54)

There are many physical problems which may lower reading achievement. Glandular dysfunction, asthma, allergies, and prolonged illness were listed by Dechant (1970). Loss of sleep is a factor which contributes to a state of fatigue (Bond and Tinker, 1973). Harris and Sipay (1975) added heart trouble, tuberculosis, sinus trouble, and rheumatic fever, the latter being the major offender in the reading cases they have treated.

Studies cited by Schubert and Torgerson (1976) showed that problems of general health were prevalent among disabled readers. In one study 875 reading failure students were compared with 486 non-failing students. The read-failure group exhibited over 21% more frequency of disease than the non-failing group.

According to Bond and Tinker (1973) glandular disturbances may be associated with reading disability. They cited authorities who found endocrine disturbances more frequent among disabled readers than among normal readers. Harris and Sipay (1975) also reported that the frequency of endocrine deviations has been greater among the disabled
readers they have seen than in the normal child population.

The endocrine glands have important regulatory functions, and medical authorities still do not completely understand them (Harris and Sipay, 1975). It is known that muscle and gland responses are interrelated. The secretion of the glands stimulate the production of proteins and other chemicals needed to support the muscle system (Robeck and Wilson, 1974).

The two most common symptoms of glandular disturbances mentioned in the literature reviewed were hypothyroidism and hyperthyroidism. Hypothyroidism is manifested by obesity and mental sluggishness and is caused by underactivity of the thyroid, while hyperthyroidism is manifested by weight loss, overactivity, and irritability and is caused by overactivity of the thyroid. Children suffering from hypothyroidism who demonstrated delayed progress in reading showed good improvement in reading over a period of time when thyroid medication was provided without change in teaching methods (Bond and Tinker, 1973). Harris and Sipay (1975) reported that such children show marked improvement in mental alertness, effort, and learning after appropriate endocrine treatment.

In 1946 Robinson found that endocrine disturbances, limited to mild cases of hypothyroidism, were found in about 33% of the 30 children examined, in 23% of those studied, but was considered a cause of reading disability in only 9%
of the 22 cases studied in detail. More than 25% of Klasen's (1972) subjects were hyperactive.

Sex Differences. Authorities agree that there is a disparity in reading readiness and on reading achievement scores between boys and girls with the boys achieving less. It has been so obvious that Dechant (1970) stated: "That there are sex differences in readiness and reading achievement in favor of the girls in this country can hardly be questioned" (p. 99). Mumpower (1970) found a ratio of 7 to 3, boys to girls, with severe reading disability.

JRB (1976) commented:

Despite years of concern for and research on the differences between girls and boys in reading achievement in many countries, the full extent and strength of both biological and cultural differences has yet to be determined. ... accurate measurement of reading differences is needed if their origins are to be perceived, and these origins must be known before instruction can be adapted to help all children achieve their potential as readers. (p. 741)

Previous research has not illuminated the topic from enough angles to develop perspective and deal with the problem in some depth, he added.

Recent studies have attempted to illuminate various points of views on this topic. Dwyer (1976) cited studies which demonstrated that boys achieve higher than girls on vocabulary tests and when "item content is scientific, mechanical, business, practical affairs or mathematical" (p. 754). Girls score higher when the content is "human relations or the arts and humanities" (p. 754). In a
review of more than 50 studies on sex differences in reading attainment of English-speaking children conducted from 1933 to 1973, Thompson (1975) found that "whether a difference favouring girls occurs seems to depend on the reading test used, including whether it is an individually administered or group administered test" (p. 18).

In order to determine if boys suffered from physiological-biological-maturational factors, Johnson (1976) investigated students in four English-speaking countries at three different grade levels. In England and Nigeria the boys scored significantly better than the girls. In Canada and America it was the opposite, with significance found in favor of the girls 5 out of 6 times in Canada and 4 out of 4 times in America. Johnson urged caution when drawing conclusions from this study because of the size of the sample and other reasons, but suggested that the results could indicate support for a societal-cultural causation of sex differences in reading rather than for physiological-biological-maturational factors. He has support for this suggestion from Zimet (1976).

**Developmental Delay.** Developmental lag is a concept introduced by Lauretta Bender in 1957. Today, the terms "maturational lag" and "developmental delay" are used synonymously with developmental lag. The concept refers to slowness of development, or maturation, of specific aspects of neurological development. Its etiology can be physical,
neurological, or social (Smith, 1976).

The delay is not uniform, but irregular, with some functions developing normally and others much delayed. For example, there may be normal development of general intelligence while the abilities that are critical for learning to read are delayed (Harris and Sipay, 1975). Holmes (1975) stated that "the learning disabled usually have areas of functioning in which learning occurs more easily. Inability to learn reading . . . often represents a maturation lag" (p. 211). Thompson (1975) found that boys in general suffer from this "lag" until age ten but then begin to attain higher scores on reading achievement tests.

Among delayed developmental processes are motor skills and language development. Normalcy in these skills is sitting up at 6-8 months, crawling at 9 months, walking at 12-18 months, uttering single words at 12-19 months, and speaking short phrases and sentences at 24 months (Anderson, et. al., 1963; Perez, 1975; Smith, 1976).

Delayed speech, or delayed language development, is often associated with reading disability. There is a positive correlation between the two. A child who has a limited vocabulary and difficulty in expressing himself in sentences is likely to become a disabled reader (Schubert and Torgerson, 1976). It was also argued by Harris and Sipay (1975) that "children who are slow in speech development during the preschool years are quite likely to develop
reading disabilities later" (p. 249). Some credence was
given to this argument by Lyle (1970). He found that chil-
dren with retarded early speech development and articula-
tory speech defects between the ages of 2.5 and 4 years
showed a definite relationship to later reading retardation.

"Comprehension in reading is closely related to
ability to understand spoken language because both involve
the understanding of concepts and sentence patterns"
(Harris and Sipay, 1971, p. 6). The child who does not or
cannot develop this ability and is "unable to talk in short,
simple sentences is frequently unable to anticipate the
meaning of a sentence" (Dallman, et. al., 1974, p. 82).
According to Dechant (1970) this occurs because reading is
a language process, the culminating act of the communci-
tive and language process.

Peck and Stackhouse (1973) found that one differ-
ence between families with a problem reader and families
without a problem reader was that reading problem families
did not provide an atmosphere for speech development. They
spent more time in silence and demonstrated fewer exchanges
of explicit information. From his study Bercovici (1973)
found that underachieving children suffered in their speech
development because of their mothers' language style.

Neurological Difficulties. Reading is neural activity;
therefore, neurological aspects of thinking are relevant
for understanding the complex process of learning to read.
Development of the central nervous system begins in the womb, and basic learning patterns are established in prenatal life. Once the total complement of neural cells have developed, they are never replaced or renewed as are other cells (Robeck and Wilson, 1974). Damaged or undeveloped cells remain thus.

There are two different views as to the etiology of neurological difficulties. In recent years, nutritionists, such as Feingold (1975) and Smith (1976) have argued that neurological difficulties may be the result of certain genetic factors (sensitivity and allergies) combined with poor diet. Feingold believes that certain persons are born with no natural body defense against synthetic food additives (colorings and flavorings), and their behavior and/or learning difficulty may be the result of an adverse reaction to such additives. Smith believes problems in carbohydrate metabolism may be the cause of such difficulties and that inadequate diet can intensify the problem of low blood sugar. The traditional view is that neurological difficulties are a result of insults or hurts to the nervous system. Some hurts or insults are difficult birth, head injury, convulsions, etc.

A term commonly used in conjunction with disorders of the central nervous system is Minimal Brain Dysfunction (MBD). ". . . [MBD] refers to subtle deviations in the functioning of the central nervous system which are not
caused by major injury" (Gibson and Levin, 1975, p. 489). They stated that MBD may be produced by:

... perinatal brain insults, or injuries or illnesses sustained during the years critical for the development of the nervous system. ... the abnormal functioning may result in various combinations of deficits in perception, conceptualization, language, memory, or control of attention which will interfere with the reading process. (p. 490)

The Food and Nutrition Board (1973) reported that malnutrition may adversely affect brain development. Research which states that an inadequate diet, especially one low in protein, can result in smaller brain size and damage to the central nervous system was cited by Schubert and Torgerson (1976). They also referred to a study of 215 poor readers which found a high percentage of malnutrition among the subjects.

In directing one's attention to symptoms that may indicate a neurological disorder, Harris and Sipay (1975) included the following: a history of difficult birth, with prolonged labor, instrumental delivery, prematurity, poor equilibrium and general awkwardness, a history of convulsive seizures or lapses of consciousness, and extreme restlessness and distractibility.

Kawi and Pasamanick (1958) compared the history of 205 retarded readers of normal intelligence with 205 normal readers. Prenatal complications were experienced by mothers of over 16% of the retarded readers as compared to less than 2% of the control. Over 11% of the retarded readers weighed
less than 5.5 pounds as compared to less than 5% of the control.

In 1959 these same two authors found that the following conditions differentiated a group of disabled readers in reading from normal readers: premature births, toxemia of pregnancy, and bleeding during pregnancy.

In her study Robinson (1946) identified neurological difficulties in 20% of those studied. They were considered a cause of reading failure in 18% of the cases. Conducting a neurological examination on a group of 190 disabled readers, Denckla (1972) attempted to classify each one. She found that 70% did not fit into any specific category. Of the remaining 30% of the readers 21% experienced possible brain injury at or near birth.

The activities of the central nervous system have a direct effect on motor and speech development and are influenced by underactivity of the thyroid gland. They can also cause hyperactivity (Robeck and Wilson, 1974).

Hypoactivity and neurological dysfunctioning can share a cause and effect relationship. Hypoactivity manifests itself when an underactivity of the thyroid produces a low metabolism rate resulting in a lowered supply of oxygen to the neurons. The result is a child who operates at a "low energy level" and is unable to complete assignments on time. Teachers may consider him lazy, retarded, or uninterested (Robeck and Wilson, 1974). "Any condition
resulting in lowered energy may interfere with concentration and effort in learning to read" (Kasdon, 1971, p. 28). A medicinal prescription to raise the metabolism rate will automatically improve learning efficiency for many of these children (Robeck and Wilson, 1974).

According to the latter two authors hyperactivity is the most common characteristic exhibited by children with MBD. There are various ways in which this condition can be caused. Diet is a prime cause according to Smith (1976). Foods like potato chips, packaged cookies, and jellies should be avoided. Smoking during pregnancy was found by Denson (1975) to be an important cause of the hyperkinetic syndrome. He compared mothers of twenty hyperactive children with mothers of twenty children retarded in reading and mothers of twenty normal children. The mothers of the twenty hyperactive children reported smoking two to three times as many cigarettes during pregnancy as the mothers of the other forty children.

Wender (1971) studied the effect that stimulant drugs had upon hyperactive children. Rather than excite them, the stimulants relaxed them. His data supported the medical opinion that stimulants are effective in controlling hyperactivity and help create the behavior needed to learn. Fifty-six subjects were studied for sixty days by Conley (1973). His experimental group received Ritalin and his control a placebo. Out of twelve criterion measures in
reading, he found significant differences on two measures in favor of the experimental group. On the other ten measures, the control made small gains on six measures but the experimental group made gains on all of them.

A large number of disabled readers exhibit poor motor coordination which is manifested by awkwardness in walking, running, writing, and athletic activities. On tests for motor coordination superior readers obtained better scores than nonreaders (Bond and Tinker, 1973), and a considerable number of poor readers were found to be generally clumsy, below average in athletic skill, awkward in walking and running, and made poorly formed letters and numbers (Harris and Sipay, 1975). General awkwardness was listed as a symptom of MBD by Clements (1966), while Klasen (1972) found that 49.2% of her dyslexic subjects displayed motor dysfunction.

Speech defects and reading appear to be related. There is adequate evidence that poor readers often have articulatory defects (Dechant, 1970). Bond and Tinker, (1973) cited authorities who believe that "faulty articulation may directly affect reading by presenting a confusion in the sounds of words to be associated with written and printed symbols" (p. 126). This confusion refers to a child who hears -d but says -g, which would cause him to hear "beg" for "bed." Research indicated that defective speech is more prevalent among retarded readers than in the general
population (Schubert and Torgerson, 1970). In a study involving forty disabled readers, aged seven to sixteen, Sonenberg and Glass (1965) found that 38 had articulatory defects. Of her 488 disabled readers, Klasen (1972) found that 22.4% had speech impediments.

**Psychological Factors**

Psychological factors can be divided into two main categories—intelligence and emotional factors. Robinson (1946) stated that "... there is a positive relationship between intelligence-test scores and reading-test scores, although the relationship is not perfect" (p. 73). Twenty-six years later Schubert and Torgerson (1972) stated, "There is little doubt that intelligence and reading are positively related ... [but] a one-to-one ratio does not exist" (p. 56-7). When Karlin (1975) claimed if one compared 100 bright kids in reading to 100 kids with average or less-than-average ability, more of the former would be superior achievers in reading, he referred to the imperfection of the ratio.

Emotional factors have a causal relationship with reading disability as demonstrated by Harris and Sipay (1975):

Among several hundred reading disability cases seen in the Queens College Educational Clinic during a fifteen-year period, close to 100 per cent showed maladjustment of some kind, and the percent in which the emotional difficulties were thought by the staff to have had a causal
Intelligence. Intelligence Quotient (IQ) is both a comparison and a ratio. One must obtain a mental age (MA) and ascertain the chronological age (CA) of the subject. "Mental age refers to mental maturity" (Schubert and Torgerson, 1972, p. 162). It means that a child with a mental age of 10.0 is intellectually comparable with 10 year-olds. IQ refers to the rate of intellectual development (Schubert and Torgerson, 1972). IQ is determined by dividing the MA by the CA.

Correlations between IQ and reading ability generally vary from about .35 in the first grade to about .65 in the sixth grade (Dechant, 1970; Karlin, 1975; Harris and Sipay, 1975). The correlations become closer in higher grades.

The high correlations between IQ and reading are not necessarily an indication that the two have closely related characteristics. Questioning the validity of the correlations, Schubert and Torgerson (1972) pointed out that reading and IQ scores are standardized on samples drawn from different populations, which makes valid comparisons impossible. Dallman, et al. (1974) stated that high correlation "may mean merely that a large part of an intelligence test calls for abilities closely related to the ability to read" (p. 25). Karlin (1975) argued that IQ
tests do not measure all the abilities children need for reading. In a study by Hagin, et. al. (1971) it was found that "no special cognitive characteristics were found to differentiate the normally achieving from the high-risk group as a whole" (p. 231).

This latter finding gains substance when considering the IQ range of disabled readers. "Severely retarded readers seem to range in mental ages and I.Q.'s about the same as unselected cases within a public school. . . . The majority have I.Q.'s between 90 and 110" (Robinson, 1946, p. 73). Belmont and Birch (1966) found that average WISC IQ's for disabled readers ranged from 91.8 to 109.8. For every five children with severe reading handicaps, four are of normal or superior intelligence (Karlin, 1975). (All authorities reviewed stated that normalcy is between 90 and 110.)

Schubert and Torgerson (1970) stated that "disabled readers are found at every level of intelligence" (p. 33). In 1972 these same two authors were more definitive when they stated that approximately 90% of the poor readers have IQ's over 80 with a range that reaches beyond 130.

That disabled readers score over such a wide range on the intelligence scale is not to suggest that IQ has no value in reading instruction. According to Karlin (1975) IQ is one of the best predictors of reading success. Dechant (1970) believed IQ to be significant in that it
puts a ceiling upon individual achievements, while Ekwall (1976) viewed low IQ to be a hindering factor.

The idea of IQ as a "hindering factor" as opposed to a "cause" of reading disability was explored by Bond and Tinker (1973):

The question may be boldly put as to whether low intelligence really causes reading disability. . . . But perhaps it would be more accurate to say that, while low intelligence in itself is not a direct cause, it may lead indirectly to reading disability. This occurs when reading instruction of the slow learner during the early school years is not adapted to his needs. The dull child is not ready to read as soon as the one with normal intelligence and he must of necessity proceed at a slower pace after he does begin. In the regular classroom situation, the slow learner is likely not to learn enough at each lesson for effective handling of the next assignment. He drops farther and farther behind as time goes on in the developmental program. If these handicaps are allowed to accumulate, he becomes a reading disability case. (p. 149)

In a study by McManua (1964) a group of kindergarten children with a mean IQ of 99 received reading instruction while a comparable group with a mean IQ of 107 did not. At the end of the third grade the control group attained higher reading achievement scores than the experimental group.

Emotional Factors. Three studies which assessed the effects of combinations of remedial reading help and individual counseling on reading attainment and self-image were described by Lawrence (1975). Reading achievement was at least two levels below the chronological age of the subjects. Group 1 received remedial help from a reading specialist, Group 2 received individual counseling from a psychologist,
Group 3 received both counseling and remedial help, and Group 4 received neither. In all three studies the counseled only groups improved more than the non-counseled groups, and in the first study, the counseled only group showed greater improvement than all others and significantly better than the group which received both counseling and remedial help and the group which received neither.

A group of below-level readers was compared with a group of on-level readers by Vilhotti (1973). Their reading achievement scores were compared with their self-social symbols scores. He found that achieving readers had a higher self-concept than the readers who were not achieving.

One hundred and four subjects were tested for self-concept, boredom, manifest anxiety, test anxiety, behavior problems, and lying by Murray (1974). He reported less positive scores for disabled readers than normal readers with significance found in all but test anxiety.

Black (1974) compared 25 normal and 25 retarded readers who were matched on IQ, grade, age, and sex. He found that the difference in self-concept between the two groups was significant at the .05 level.

After a study of 580 subjects, Harrington (1972) reported a significant, positive relationship existed between reading achievement and attitude toward reading.

Variance in self-concept and attitudes was found between the sexes. Coley (1973) concluded that for boys
who are remedial readers, there is a positive relationship between self-concept and reading level while Harrington (1972) found that girls had significantly more positive attitudes toward school and reading than boys.

There has been some question as to which came first, personality problems or reading disability.

In a relatively small number of cases, the child is emotionally upset when he arrives at school. Such a child is apt to encounter difficulty in reading. In many cases, the frustration arises from failure to learn to read. In these cases the reading difficulty causes the emotional upset. It seems that, in many cases, emotional maladjustment may be both effect and cause. (Bond and Tinker, 1973, p. 158)

In an attempt to determine what effect a particular reading program had on the personality characteristics of third grade children who were both high and low achievers in reading, Tripp (1973) compared three groups using three different reading programs. She found that "... the personality characteristic of feeling insecure or anxious is developed or enhanced in the low achiever by his reading 'problems'" (p. 1505). From her data "it would appear that the program of reading instruction and the child's success or failure with that instruction has some effect on his personality" (p. 1506). After studying the psychological effects of visual training, Bachara and Zabo (1976) stated:

Results seem to confirm some of the early workers in the field who felt that social-emotional problems resulted from a child's learning difficulties and that with proper remediation and intervention much of the social-emotional difficulty would subside. (p. 102)
Socioeconomic Factors

Most studies investigating socioeconomic factors as a cause of reading disability are concerned with low-income and minority groups. However, Smith (1971) believed that poor and wealthy alike "... may be condemned by environmental factors to frustration in reading" (p. 11). He continued:

Children from wealthy families may have reading problems created by the environment. Certain language and reading problems are not isolated to poor neighborhoods. It is not luxury that creates an atmosphere conducive to reading; it is what happens to the child in his home and neighborhood that makes the difference. (p. 11)

In Robinson's (1946) study maladjusted homes or poor interfamily relationships were found to be contributing causes in 54.5% of the cases studied.

Findings emphasize the importance of the home and of the social environment on the total adjustment of the child. They imply that a stable, wholesome home environment exerts a definite influence on the school progress of the child. Furthermore, such findings show that a child's failure to learn to read may be due to factors far beyond his own control and, not infrequently, beyond the control of those charged with responsibility for his progress. (p. 222)

Peck and Stackhouse (1973) indicated that reading problem families tend to have a closed communication atmosphere and have taught the child how not to learn. It was suggested by Bannatyne (1971) that such a nonverbal environment negates the possibility of references to logical relationships which are important in reading.
Educational Level of Parents. Success in reading appears to be related to the educational level of the parents. Gibson and Levin (1975) cited Thorndike's (1973) "vast empirical study of reading comprehension" in which the latter found the parents' educational level consistently turned up as a factor in learning to read.

The opposite was determined by Peck and Stackhouse (1973) who found that the parents' educational level was not a significant factor in their children's ability to learn to read.

Economic Level of Parents. The economic level of the parents was frequently cited as a factor in learning to read (Ekwall, 1976; Thorndike, 1973). That a low economic level went with low reading scores was found by Callaway (1972).

But Thompson (1975) concluded that "differences in attainment levels between socioeconomic groups are less than many differences between individuals within a socioeconomic group" (p. 22). It was found that the father's occupational level was not a significant factor in the reading achievement of their children (Peck and Stackhouse, 1973). It appeared to be unrelated to reading (Callaway, et al., 1974; Hensley, 1973).

Parents Support for School. The parents' opinion of the school apparently can have an influence upon the child's achievement. Smith (1971) stated that a characteristic of
the underachieving child is his lack of enthusiasm for school. His parents may tell him that school is a doubtful commodity, whereas when the parent describes school in exciting terms, the child usually looks forward to school. Factors which impede educational adjustment are parental attitudes which are indifferent to education or actually hostile to school (Harris and Sipay, 1972). Parents of early readers who were interested in school affairs were cited by Dechant (1970). In an evaluation of 489 elementary school children Miller (1970) found that parental support had a positive correlation with reading achievement.

Lack of Exposure to Reading. Apparently, exposure to reading material at home influences achievement in school. That the amount of reading material in the home had a positive correlation with successful reading was found by Callaway (1972). In 1974 this same author, with others, found that generally, subjects who were rated highest in amount of reading material at home were also highest in reading achievement. It was reported by Thorndike (1973) that reading resources in the home was another frequent factor in learning to read. A study in which 73% of the early readers had access to reading material at home as compared to 23% of the nonearly readers was cited by Gibson and Levin (1975).

Ordinal Positions. Ordinal position within families was
investigated as a possible cause of reading disability. In 1965 Otto compared 300 good readers with 300 poor readers in order to determine if eldest and only children were more predominant in the good reading group than later born children. Otto found that the good reader group contained more of the eldest and only children and the poor reader group contained more later born children. Oberlander and Jenkin (1967) found a significant difference among birth order groups in relation to reading achievement scores with first born children achieving higher than later born children.

In contrast to these findings, Vockell and Bennett (1972) studied 482 children and found no significant difference among birth positions in relation to learning disabilities. Polirstok (1975) attempted to determine if first born and only children would have significantly higher scores on a reading achievement test than later born children. She found no significant difference between the reading performance of the first born-only child group and the later born group.

Birth order of siblings was explored in a number of studies, but the evidence was not consistent, with as many studies denying significance as studies finding a relationship (Spache, 1976b).

Sibling Rivalry. "A number of unfortunate home conditions may bring about emotional maladjustment in the child," one of which is unhealthy rivalry among children (Bond and
and Tinker, 1973, p. 141). These authors cited a study in which the investigator conducted an intensive case study of 23 disabled readers. The investigator found there was marked sibling jealousy in 15 of the 23 cases. According to Early (1969) authorities have found that some children suffer from emotional disturbances due to sibling rivalry. In a discussion of 5 non-reading students, sibling rivalry was noted in one case (Bullock, 1969).

Four case studies of disabled readers were described by Blanchard (1969). One, a seven year old boy, suffered from the effects of sibling jealousy he felt toward three younger brothers at home. He spent his classroom time fearing that his mother cared more for them than for him. After 18 hours of treatment he could accept sharing his mother with other children without feeling this meant rejection for himself, and he was also reading satisfactorily in school.

**Family Size.** Among the difficulties related to the environmental aspects of reading, Monroe (1969) included the number of siblings in a family. Durkin (1966b) found 80% of her early readers came from families with one or two siblings as compared to 20% who came from families with three to five siblings.

Families ranging in size from one child to nine children were studied by Greer and Whitley (1971). They found, significant at the .001 level, that a large
proportion of the disabled children came from large (three or more siblings) families. In an investigation of possible reasons for the differences in rates of emotional and conduct disorders and in specific retardation between ten year olds, Rutter, et. al. (1974) found that large family size was significantly associated with specific reading retardation.

Broken Homes. "Youngsters who come from broken homes . . . are in a perpetual state of emotional turmoil" (Schubert and Torgerson, 1976, p. 58). Ekwall (1976) cited authorities who stated that children from intact homes do better in scholastic achievement than children from broken homes. However, Safer, et. al. (1973) found that broken homes had no effect on reading ability. Research indicated that the issue of broken homes is not consistently found as important in school success (Spache, 1976b).

Educational Factors

This section will review the role of various educational factors as contributing causes of reading disability. Discussion will include reading readiness, student mobility, and absenteeism.

Reading Readiness. One of the problems in education is that formal instruction is instituted without assessing the child's readiness for formal reading instruction. "Timing of instruction is especially important in preventing
Reading disability is frequently caused by starting a child in a standard reading program before he has acquired the readiness which will assure success in classroom reading activities. Due to his lack of experience, verbal facility, intellectual or emotional maturity, or a combination of these, he is unable to achieve enough of the learnings day by day to handle satisfactorily what is coming next. He gets farther and farther behind as time goes on. (Bond and Tinker, 1973, pp. 151-2.

Agreement was voiced by Sawyer (1975): "... instructional concerns assume adequate development of perceptual, cognitive and linguistic competencies" (p. 621).

Karlin (1975) reported on the early investigations into readiness for beginning reading. While the results of these investigations were not consistent, those who interpreted the results included this statement among their conclusions:

Children with rich language and experiential backgrounds seem to do much better than children with meager ones. Children who participate in activities that are associated with beginning reading seem better prepared for reading than children who have not engaged in them. (p. 99)

The kindergarten experience can have a beneficial effect upon reading when reading is taught at that level. Brzeinski (1964) compared 2000 kindergarten children who received instruction in beginning consonant sounds and context clues in order to identify unknown words with 2000 kindergarten children who received no formal instruction in reading. At the end of first grade, the experimental group
scored significantly higher on standardized reading tests than the control.

One hundred and five third graders who had received limited, unstructured reading instruction in kindergarten were compared with 107 third graders who had not received the same reading instruction by McManua (1964). At the end of the third grade, McManua found that for subjects with comparable IQ's, the experimental group scored nearly 1.5 years better than the control in reading achievement.

Durkin (1961, 1962, 1966a, 1966b), in various longitudinal studies of children who read before first grade, found that after 6 years of reading instruction, the early readers achieved better than the children who began reading in first grade.

**Student Mobility.** A change of schools may be a possible cause of reading disability. According to Harris and Sipay (1975), "Failure to acquire good reading habits is sometimes the direct result of frequent changes of teachers in the primary grades, with consequent confusion of teaching methods" (p. 293). After analyzing case study summaries of disabled readers, Hildreth and Wright (1969) found frequent changes of school during the primary years. Rutter (1974) found that greater teacher and pupil turnover tended to be associated with reading retardation.

However, Misner (1972), who studied mobile and stable military and civilian students, found no significant
difference in reading achievement between mobile and stable military and civilian students. The relationship between reading achievement and pupil mobility in high mobility–low income elementary schools was investigated by Black and Borgar (1975). They found that the reading achievement of mobile pupils is not significantly different from stationary pupils.

**Absenteeism**. Absences can cause the child to fail in his efforts to acquire essential learnings. Interruption of sequential skills could cause him to become severely handicapped in subsequent assignments (Bond and Tinker, 1973). A history of a series of long absences in the first and second grade is found fairly often among children with severe reading handicaps (Harris and Sipay, 1975).

Rutter (1974) found that reading retardation was associated with a higher rate of absenteeism. Early (1969) and Hildreth and Wright (1969) also noted absence from school as concomitant with reading disabilities.

**READING CLINICS**

The literature is skimpy in relation to public school reading clinics (Roberts, 1973) as was information on private reading clinics.

Grace M. Fernald founded the first reading clinic at the University of California, Los Angeles in 1920. Because of the apparent success of this clinic, other
universities were encouraged to start their own. By 1964 reading clinics grew in number all over the country and were still growing (Roberts, 1973). A review of the compilations of reading graduate programs in the United States by the International Reading Association revealed that all but about ten universities listed have reading clinics (Guthrie, 1976).

According to Bond and Tinker (1973), "The clinic's greatest aid to a public school system is in making more thorough diagnosis than can be obtained elsewhere" (p. 195).

A complex reading disability case needs clinical diagnosis of his problem and often the reading diagnostician must enlist the services of other specialists in order to appraise the child's needs accurately and thoroughly. (p. 198)

Parents are important in diagnosis of reading disabilities (Orton, 1971). He stated that it is the parents who can contribute a serial account of the child's personality development, environmental experiences which may have contributed to the disability, important details of gestation, birth, illnesses, and early speech patterns and describe the child's family and peer relationships.

The effects of clinical instruction are varied. After comparing (1) students who needed clinical help and received it, (2) students who needed clinical help but did not receive it, and (3) a control group, Dittman (1974) found that classroom performance is greatly improved by attendance at a reading clinic.
Increased classroom performance has many personal benefits to the individual student and increases the school system's holding power. Successful students are happy students, and happy students stay in school. (p. 711)

In a longitudinal study conducted between 1966 and 1970, Fielder (1972) concluded that her study supports the conviction that remedial help has far-reaching effects, i.e., it has a long-term effect upon reading.

SUMMARY

There are many possible inhibiting factors related to reading disability, but what is debilitating for one may not be so for another. It is widely believed that there is no single factor of reading disability but rather a multiple of factors interact to produce a reading disability. Possible factors appear to be physical, psychological, socio-economical, and educational factors.

While reading clinics have become numerous across the United States, empirical evidence as to their effectiveness is rather meager. However, there is some indication that they have a beneficial effect upon disabled readers.
Chapter 3

RESEARCH DESIGN AND PROCEDURES

INTRODUCTION

Chapter 2 presented a review of the literature regarding the relationships between possible factors in reading disability and variance in reading achievement among normal and disabled readers. In this chapter the design of the study and procedures to implement the study is presented.

RESEARCH DESIGN

Using a case study approach and drawing ex post facto from available data, a study was made of the subjects to assess their physical, psychological, socioeconomic, and educational development, IQ, and reading achievement scores.

ANALYSIS OF DATA

A mean point gain was determined for the subjects with a specific anomaly and for the subjects without the same, specific anomaly. The two means were compared. In each instance the hypothesis was accepted when the anomaly group mean was lower and was rejected when the anomaly group mean was higher.
SAMPLE

The cumulative records of the 73 students who attended CRC 1976 summary sessions were assembled. Test results from the initial diagnosis of these students were inserted into the Bond/Clymer reading expectancy formula. This process eliminated 26 students and left a total of 47 students to be included as subjects for the study.

The sample consisted of 47 subjects from a middle-class, socioeconomic background. There were 41 boys and 6 girls ranging in age from 6 to 15 years of age. Their actual grade-placement ranged from first to ninth grade.

The subjects were selected according to the difference between their reading achievement and their reading potential. Primary grade subjects whose reading achievement was at least one year below their reading potential and older subjects whose reading achievement was at least two years below their reading potential according to the Bond/Clymer formula were included in the sample.

The Bond/Clymer formula was included by Honel (1973) when he compared eight reading expectancy formulas. He reported no significant difference among five, one of which was the Bond/Clymer formula. The study suggested that those who are currently using any of these formulas could continue to use them with considerable confidence. A detailed explanation with comparisons with other expectancy formulas and IQ tests can be found in Bond and Tinker (1973).
PROCEDURES

Utilizing the information from the Child Study Form, Diagnostic Test Summary, Pupil Profile (see Appendices B, C, and D), and final test results, a master chart was compiled. Each of the subjects were assigned a number, and the numbers were listed down the left side of the chart. The various anomalies included in the study were listed across the top of the chart (see Figure 1).

Visual acuity anomalies, chronic physical anomalies, and neurological anomalies are categories, each of which includes several different types of difficulties. They are grouped under these categories because the review of the literature revealed that no studies were undertaken which investigated the different possible individual anomalies which could be present in any subject. Rather, authorities discuss categories of anomalies which appear most often in disabled readers.

The subjects were enrolled at CRC between June 21 and August 26, 1976. All subjects received a total of twenty-four hours of instruction.

All subjects were administered a battery of tests (see pages 62; 71-72), the parents of all the subjects were required to complete a Child Study Form which includes information pertaining to the subjects' school, personal, and medical history, all parent(s) met with the director to discuss the results of the tests, the information on the Child
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% of S's with Anomaly: 21  77  8  77  26  87  30  23  47  60  11
Raw Pt. Gain: 108  305  30  277  112  373  113  122  207  205  28
Mean Pt. Gain: 10.8  8.5  7.5  7.7  9.3  9.1  8.1  11.1  9.4  7.3  5.6

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<th>0</th>
<th>35</th>
<th>14</th>
<th>16</th>
<th>6</th>
<th>0</th>
<th>21</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of S's with Anomaly</td>
<td>64</td>
<td>60</td>
<td>0</td>
<td>43</td>
<td>0</td>
<td>74</td>
<td>30</td>
<td>34</td>
<td>13</td>
<td>0</td>
<td>66</td>
<td>17</td>
</tr>
<tr>
<td>Raw Pt. Gain</td>
<td>269</td>
<td>250</td>
<td>0</td>
<td>181</td>
<td>0</td>
<td>316</td>
<td>103</td>
<td>127</td>
<td>38</td>
<td>0</td>
<td>264</td>
<td>85</td>
</tr>
<tr>
<td>Mean Pt. Gain</td>
<td>9.0</td>
<td>8.9</td>
<td>0</td>
<td>9.1</td>
<td>0</td>
<td>9.0</td>
<td>7.4</td>
<td>7.9</td>
<td>6.3</td>
<td>0</td>
<td>8.5</td>
<td>10.6</td>
</tr>
<tr>
<td>% of S's without Anomaly</td>
<td>17</td>
<td>19</td>
<td>47</td>
<td>27</td>
<td>47</td>
<td>12</td>
<td>33</td>
<td>31</td>
<td>41</td>
<td>47</td>
<td>16</td>
<td>39</td>
</tr>
<tr>
<td>% of S's without Anomaly</td>
<td>36</td>
<td>60</td>
<td>100</td>
<td>57</td>
<td>100</td>
<td>26</td>
<td>70</td>
<td>66</td>
<td>87</td>
<td>100</td>
<td>34</td>
<td>83</td>
</tr>
<tr>
<td>Totals</td>
<td>409</td>
<td>423</td>
<td>2670</td>
<td>2670</td>
<td>445</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1 (Continued)
Study Form, and recommendations for the subjects' future course of study. All this data was analyzed for all subjects in order to determine the existence of any anomaly included in this study and for testing the hypotheses. Unless otherwise stated, the following discussion refers to Figure 1.

A subject was determined to be afflicted with past and/or present visual acuity anomalies by analyzing the above mentioned data and observation during the initial testing. This was supplemented by data from the subject's school records, and if warranted, by correspondence with the subject's physician. If a subject suffered from a visual anomaly, an X was placed in this column next to the subject's number.

Visual perception anomalies were determined mainly through observation during initial testing. A subtest of the battery of tests used at CRC is the Oral Reading subtest of the Wide Range Achievement Test (WRAT).

The WRAT, revised in 1965, measures reading, spelling, and arithmetic skills. It is designed primarily as an individual test, but its "individual" feature is limited to its word pronunciation (Oral Reading) subtest. Sampling was accomplished by selecting items in each of the three areas which showed a regularly increasing percentage of successes at succeeding grade levels. It appears to have adequate face validity as a coarse screening measure in the
three areas. It provides a rough grade placement of a patient prior to more detailed diagnostic testing at specific grade levels (The Third Mental Measurements Yearbook, Buros, 1949).

As the subject read aloud, any reversals and/or confusion with letters, such as b, d, p, and q were recorded. If a pattern appeared, then the subject was determined to be suffering from a visual perception anomaly and an X was placed in this column next to the subject's number.

The procedure followed for determining auditory acuity anomalies was the same as that followed for determining visual acuity anomalies.

Auditory discrimination anomalies were determined by analyzing the results of the Wepman Auditory Discrimination Test.

According to Ekwall (1976) the best known and most used of auditory discrimination tests is the Wepman. It is an individual test in which the examiner pronounces a number of words that are either alike or alike except for one phoneme, e.g., lack-lack and tub-tug. The student responds by stating whether the two words are the same or different in sound.

If a subject was found to be suffering from this anomaly, an X was placed in this column next to the subject's number.

The chronic physical anomalies column covers a
multitude of illnesses, such as asthma, allergies, sinus trouble, and rheumatic fever. The category includes those illnesses that linger and cause absence from school and distracting discomfort as opposed to those which occur periodically and pass comparatively quickly, such as the flu or a cold. A subject suffering chronic, physical anomaly has an X next to his number in this column.

An X next to the subject's number in the sex column indicates a male subject.

Time-spans were determined as to when children should begin to sit-up, crawl, and talk and expand upon these skills. Any subject who began to demonstrate these skills later than the latest time advanced by authorities was considered to have delayed motor and language development. For example, children, according to authorities, should begin to sit-up from 6 to 8 months of age. Any subject who began sitting-up at 9 months (one month later than the latest time advanced) would have been delayed in this skill. An X in the motor development and/or language development column indicates that the subject suffered from these anomalies.

The procedure followed for determining neurological, motor coordination, and speech anomalies was the same as that followed for determining visual acuity anomalies.

The column headed IQ contains the IQ for each subject. After a chart was compiled, it was determined that
there were 29 different scores (see Figure 2). Three groups were comprised from these scores. The lowest 10 scores were called Group A, the next 10 higher scores were called Group B, and the 9 highest scores were called Group C. Each group was compared with each of the other two groups to determine if subjects with the lowest IQ's achieved less than subjects with higher IQ's. These IQ's were determined by the Slosson Intelligence Test.

The Seventh Mental Measurements Yearbook (Buros, 1972) lists the Slosson Intelligence Test (SIT) as a brief individual test of intelligence designed to be used by relatively untrained examiners as well as qualified professionals in working with both children and adults. An adaptation of items from the Stanford-Binet and the Gesell Developmental Schedules, SIT appears to be valuable as a quick screening device. Comparability of IQ scores between SIT and Stanford-Binet was a goal of test construction and the goal seems to be met.

The SIT was found to have greater validity than two other brief individual tests which can be administered by classroom teachers. It was included by Pikulski (1973) when he tested the validity of three easily administered measures of intelligence with the WISC. He found that the SIT correlated significantly with the full scale score of the WISC.

For self-concept the procedure was essentially the
<table>
<thead>
<tr>
<th>IQ</th>
<th>81</th>
<th>86</th>
<th>93</th>
<th>95</th>
<th>96</th>
<th>97</th>
<th>98</th>
<th>99</th>
<th>100</th>
<th>102</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Subjects with this IQ Score</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Raw Point Scores for Each IQ Score</td>
<td>21</td>
<td>8</td>
<td>6</td>
<td>3</td>
<td>9</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Totals</td>
<td>21</td>
<td>9</td>
<td>6</td>
<td>3</td>
<td>17</td>
<td>3</td>
<td>11</td>
<td>5</td>
<td>22</td>
<td>13</td>
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<tr>
<td>IQ</td>
<td>103</td>
<td>104</td>
<td>105</td>
<td>106</td>
<td>107</td>
<td>110</td>
<td>111</td>
<td>112</td>
<td>113</td>
<td>114</td>
</tr>
<tr>
<td>Group B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Number of Subjects with this IQ Score</td>
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<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Raw Point Scores for Each IQ Score</td>
<td>13</td>
<td>2</td>
<td>22</td>
<td>1</td>
<td>5</td>
<td>20</td>
<td>4</td>
<td>9</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Totals</td>
<td>22</td>
<td>4</td>
<td>7</td>
<td>30</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td>43</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>IQ</td>
<td>115</td>
<td>116</td>
<td>117</td>
<td>118</td>
<td>119</td>
<td>120</td>
<td>121</td>
<td>122</td>
<td>142</td>
<td></td>
</tr>
<tr>
<td>Group C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Subjects with this IQ Score</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Raw Point Scores for Each IQ Score</td>
<td>20</td>
<td>2</td>
<td>28</td>
<td>8</td>
<td>15</td>
<td>2</td>
<td>15</td>
<td>12</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>52</td>
<td>2</td>
<td>28</td>
<td>8</td>
<td>58</td>
<td>6</td>
<td>15</td>
<td>15</td>
<td>19</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2

Groupings of IQ Scores
same as the procedure for determining visual acuity anomalies. The difference between the procedures was that much of the data was accumulated by the Director during the initial testing stage and, if indicated, direct telephone calls to the subject's psychologist if any and the subject's school psychologist or psychomotrist. Copies of written reports were then requested from these individuals. An X in this column indicates that a subject suffered from a poor self-concept.

The educational level of parents was separated between a high-school education and a college education. If either parent was graduated from college, then both parents were included in the college-educated section. An X in this column means that neither of the subject's parents received a college education.

Based on the 1970 census, the median income in the City of Camarillo was $12,947; therefore, $12,947 per year was selected as the basis for determining economic status of the parents. A subject whose parents earned less than $12,947 per year was determined to be of low economic status by Camarillo standards, and an X was placed in the economic level-parents column.

During the Parent/Director Conference, the parent(s) was questioned about his attitude toward the school(s) that the subject attended in the past and the school he was presently attending. If the parent(s) demonstrated negative
support of the subject's school(s), an X was placed in the non-support of school column.

For a subject to be exposed to reading indicates that the subject was read to on a regular basis and that he had access to reading material even before he was able to read. Reading habits of the parent(s) and siblings were also evaluated by utilizing the information obtained during the Parent/Director Conference and on the Child Study Form. The intention was to determine whether or not the subject was reared in an environment that promoted reading. If the opposite was true, an X was placed in the non-exposure to reading column.

Ordinal position refers to any position of birth among the children in the family other than first born or only child. If the subject received an X in this column, then he was neither the first born nor an only child.

The procedure followed for determining visual acuity anomalies was the procedure followed for determining whether or not the subject experienced a negative rivalry with any of his siblings by utilizing the information obtained during the Parent/Director Conference and on the Child Study Form. If this was affirmative, an X was placed in the sibling rivalry column.

Family size refers to a family with four or more children. If a subject has three or more siblings, an X was placed in the family size column.
The Child Study Form was examined and the parent(s) was questioned to determine if the subject lived with both natural parents and if there was excessive arguing between parents. If the subject lost a parent because of death, lived with one parent because of separation or divorce, or overheard excessive arguing between parents, an X was placed in the marital stability column.

All subjects attended kindergarten; therefore, there are no X's in this column.

The subject's Child Study Form was examined to determine whether or not he changed school during the primary years. If a subject did change schools during the primary years, an X was placed in the changed schools column.

If a subject was found to have a history of a series of long absences (3-5 days at a time) and/or a total of at least 10 days absence during the school year, an X was placed in the absenteeism column.

A number was placed in the total anomalies column to indicate the number of anomalies experienced by each subject. This was accomplished by counting the number of X's on the line next to the subject's identification number. IQ scores below 90 were counted as anomalies.

A chart was compiled to determine the amount of anomalies of each subject and the number of subjects afflicted by the various amounts. It was determined that there were 13 different categories (see Figure 3). Three
### Groupings of Total Anomalies

<table>
<thead>
<tr>
<th>Amount of Anomalies</th>
<th>Group A</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Number of Subjects with this Amount of Anomalies</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Raw Point Gain for this Amount of Anomalies</td>
<td>4</td>
<td>32</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>24</td>
<td>32</td>
<td>22</td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amount of Anomalies</th>
<th>Group B</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Subjects with this Amount of Anomalies</td>
<td>6</td>
<td>9</td>
<td>6</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Raw Point Scores for this Amount of Anomalies</td>
<td>2</td>
<td>6</td>
<td>9</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>51</td>
<td>147</td>
<td>26</td>
<td>65</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amount of Anomalies</th>
<th>Group C</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Subjects with this Amount of Anomalies</td>
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<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Raw Point Scores for the Amount of Anomalies</td>
<td>8</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>20</td>
<td>3</td>
<td>6</td>
<td>17</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3.

Groupings of Total Anomalies
groups were comprised using the number of anomalies as a basis. Group A had the four lowest amounts of anomalies, Group B had the next four higher amounts of anomalies, and Group C had the highest amounts of anomalies. Each group was compared with each of the other two groups to determine if subjects with the highest amounts of anomalies achieved less than subjects with lower amounts of anomalies.

The last three columns include each subject's initial reading test raw score, final reading test raw score, and raw score point gain between pre and posttesting.

Authorities stated that a battery of tests is essential for the most accurate diagnosis. Those chosen for this study included the Gates-MacGinitie Reading Tests, reading subtest of the Wide Range Reading Test (discussed earlier), The Nelson Reading Test, and The Nelson-Denny Reading Test.

The Gates-MacGinitie Reading Tests, revised in 1965, are designed for use with students in grades one through six. They are a combination of revisions of the Gates Primary Reading Tests, Gates Advanced Primary Reading Test, and the Gates Reading Survey. The tests measure vocabulary and comprehension. The standardization appears to have been rather carefully done. The tests reflect a marked improvement over their predecessors. As compared with other general reading tests, the Gates-MacGinitie Reading Tests provide usable data on achievement in
comprehension and vocabulary (The Seventh Mental Measurements Yearbook, Buros, 1972).

The 1962 revised edition of The Nelson Reading Test for grades three through nine is a revision of The Nelson Silent Reading Test. The revision has a paragraph comprehension section which contains a little more challenging and varied material than it did in the older test and a vocabulary section composed of the best items, selected on the basis of item analysis, from the original forms. The test appears to be effective as a rough measure of reading achievement. The standardization procedure was meticulous and comprehensive. The test appears to be reliable and gives some evidence of validity (The Sixth Mental Measurements Yearbook, Buros, 1965).

The 1960 edition of The Nelson-Denny Reading Test is for grades nine through sixteen and adults. It has four scores: vocabulary, comprehension, total, and rate. It is a revision and improvement of a test already well known and widely used. The test is composed of a 100 item vocabulary and 36 item reading comprehension section, both of traditional multiple choice types. New features are reading-rate score and more complete norms. It shows evidence of careful construction. This test is one of the better of its kind and represents a useful improvement of an already useful test. In general, the test may be expected to provide useful information (The Sixth Mental Measurements
SUMMARY

An ex post facto design was used on 47 subjects to assess their physical, psychological, socioeconomic, and educational development, IQ, and reading achievement scores. Inclusion in the study was based upon the results of the Bond/Clymer reading formula. The anomalies were classified in the following manner: (1) Physical, (2) Psychological, (3) Socioeconomic, and (4) Educational anomalies.
Chapter 4

PRESENTATION AND ANALYSIS OF DATA

INTRODUCTION

Chapter 3 presented the design of the study and procedures to implement the study. This chapter presents and analyzes the data related to the 25 hypotheses. No attempt was made to analyze the data statistically. A mean point gain was determined for the subjects with a specific anomaly and for the subjects without the same, specific anomaly. The two means were compared.

PRESENTATION OF THE DATA

Hypothesis No. 1

This hypothesis stated that reading achievement in the clinical program will be inhibited by visual acuity anomaly of the subject. Table 1 shows the results of the analysis of the data.
Table 1

Analysis of the Data Between Subjects Afflicted with Vision Acuity Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th></th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anomaly</td>
<td>10</td>
<td>108</td>
<td>10.8</td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>37</td>
<td>337</td>
<td>9.1</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects with a visual acuity anomaly. Therefore, Hypothesis No. 1 was rejected.

Hypothesis No. 2

This hypothesis stated that reading achievement in the clinical program will be inhibited by visual perception anomaly of the subject. Table 2 shows the results of the analysis of the data.
Table 2

Analysis of the Data Between Subjects Afflicted with Visual Perception Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with Anomaly</td>
<td>36</td>
<td>305</td>
<td>8.5</td>
<td></td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>11</td>
<td>140</td>
<td>12.8</td>
<td>4.3</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects without a visual perception anomaly. Therefore, Hypothesis No. 2 was sustained.

Hypothesis No. 3

This hypothesis stated that reading achievement in the clinical program will be inhibited by auditory acuity anomaly of the subject. Table 3 shows the results of the analysis of the data.
Table 3

Analysis of the Data Between Subjects Afflicted with Auditory Acuity Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with Anomaly</td>
<td>4</td>
<td>30</td>
<td>7.5</td>
<td></td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>43</td>
<td>415</td>
<td>9.7</td>
<td>2.2</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects without an auditory acuity anomaly. Therefore, Hypothesis No. 3 was sustained.

Hypothesis No. 4

This hypothesis stated that reading achievement in the clinical program will be inhibited by auditory discrimination anomaly of the subject. Table 4 shows the results of the analysis of the data.
Table 4

Analysis of the Data Between Subjects Afflicted with Auditory Discrimination Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th></th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with Anomaly</td>
<td>36</td>
<td>277</td>
<td>7.7</td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>11</td>
<td>169</td>
<td>15.4</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects without an auditory discrimination anomaly. Therefore, Hypothesis No. 4 was sustained.

Hypothesis No. 5

This hypothesis stated that reading achievement in the clinical program will be inhibited by chronic physical anomaly of the subject. Table 5 shows the results of the analysis of the data.
Table 5
Analysis of the Data Between Subjects Afflicted with Chronic Physical Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th></th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with Anomaly</td>
<td>12</td>
<td>112</td>
<td>9.3</td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>35</td>
<td>333</td>
<td>9.9</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects without a chronic physical anomaly. Therefore, Hypothesis No. 5 was sustained.

Hypothesis No. 6

This hypothesis stated that reading achievement in the clinical program will be inhibited by the male sex of the subject. Table 6 shows the results of the analysis of the data.
Table 6

Analysis of the Data Between Subjects Afflicted with Sex Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with Anomaly</td>
<td>41</td>
<td>373</td>
<td>9.1</td>
<td></td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>6</td>
<td>72</td>
<td>12.0</td>
<td>2.9</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects without a male sex anomaly. Therefore, Hypothesis No. 6 was sustained.

**Hypothesis No. 7**

This hypothesis stated that reading achievement in the clinical program will be inhibited by motor development anomaly of the subject. Table 7 shows the results of the analysis of the data.
Table 7
Analysis of the Data Between Subjects Afflicted with Motor Development Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th>N</th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>113</td>
<td>8.1</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>332</td>
<td>10.1</td>
<td></td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects without a motor development anomaly. Therefore, Hypothesis No. 7 was sustained.

Hypothesis No. 8

This hypothesis stated that reading achievement in the clinical program will be inhibited by language development anomaly of the subject. Table 8 shows the results of the analysis of the data.
Table 8

Analysis of the Data Between Subjects Afflicted with Language Development Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with Anomaly</td>
<td>11</td>
<td>122</td>
<td>11.1</td>
<td></td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>36</td>
<td>323</td>
<td>9.0</td>
<td>2.1</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects with a language development anomaly. Therefore, Hypothesis No. 8 was rejected.

Hypothesis No. 9

This hypothesis stated that reading achievement in the clinical program will be inhibited by neurological anomaly of the subject. Table 9 shows the results of the analysis of data.
Table 9

Analysis of the Data Between Subjects Afflicted with Neurological Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with Anomaly</td>
<td>22</td>
<td>207</td>
<td>9.4</td>
<td></td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>25</td>
<td>238</td>
<td>9.5</td>
<td>.1</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects without a neurological anomaly. Therefore, Hypothesis No. 9 was sustained.

Hypothesis No. 10

This hypothesis stated that reading achievement in the clinical program will be inhibited by motor coordination anomaly of the subject. Table 10 shows the results of the analysis of the data.
Table 10
Analysis of the Data Between Subjects Afflicted with Motor Coordination Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th>N</th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with Anomaly</td>
<td>28</td>
<td>205</td>
<td>7.3</td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>19</td>
<td>240</td>
<td>12.6</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects without a motor coordination anomaly. Therefore, Hypothesis No. 10 was sustained.

Hypothesis No. 11

This hypothesis stated that reading achievement in the clinical program will be inhibited by speech anomaly of the subject. Table 11 shows the results of the analysis of the data.
Table 11
Analysis of the Data Between Subjects Afflicted with Speech Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with Anomaly</td>
<td>5</td>
<td>28</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>42</td>
<td>417</td>
<td>9.9</td>
<td>4.3</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects without a speech anomaly. Therefore, Hypothesis No. 11 was sustained.

Hypothesis No. 12

This hypothesis stated that reading achievement in the clinical program will be inhibited by the lower intelligence quotient of the subject. Table 12 shows the results of the analysis of the data.
### Table 12

Analysis of the Data Between Subjects Afflicted with Intelligence Quotient Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th>Subjects with IQ's of:</th>
<th>N</th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. 81-102</td>
<td>15</td>
<td>110</td>
<td>7.3</td>
<td></td>
</tr>
<tr>
<td>B. 103-114</td>
<td>18</td>
<td>132</td>
<td>8.8</td>
<td></td>
</tr>
<tr>
<td>C. 115-142</td>
<td>14</td>
<td>203</td>
<td>14.5</td>
<td></td>
</tr>
<tr>
<td>Between Groups A and B</td>
<td></td>
<td></td>
<td></td>
<td>1.5</td>
</tr>
<tr>
<td>Between Groups A and C</td>
<td></td>
<td></td>
<td></td>
<td>7.2</td>
</tr>
<tr>
<td>Between Groups B and C</td>
<td></td>
<td></td>
<td></td>
<td>5.7</td>
</tr>
</tbody>
</table>

There were differences among the three groups always in favor of the group with the higher IQ scores. Therefore, Hypothesis No. 12 was sustained.

**Hypothesis No. 13**

This hypothesis stated that reading achievement in the clinical program will be inhibited by self-concept anomaly of the subject. Table 13 shows the results of the analysis of the data.
Table 13

Analysis of the Data Between Subjects Afflicted with Self-Concept Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th></th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with Anomaly</td>
<td>269</td>
<td>9.0</td>
<td></td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>176</td>
<td>10.4</td>
<td>1.4</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects without a self-concept anomaly. Therefore, Hypothesis No. 13 was sustained.

Hypothesis No. 14

This hypothesis stated that reading achievement in the clinical program will be inhibited by the lower educational level of the parents of the subject. Table 14 shows the results of the analysis of the data.
Table 14

Analysis of the Data Between Subjects Afflicted with Educational Level Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with Anomaly</td>
<td>28</td>
<td>250</td>
<td>8.9</td>
<td></td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>19</td>
<td>195</td>
<td>10.3</td>
<td>1.4</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects without parents with a lower educational level. Therefore, Hypothesis No. 14 was sustained.

Hypothesis No. 15

This hypothesis stated that reading achievement in the clinical program will be inhibited by the economic level of the parents of the subject.

Because there were no subjects in this study who suffered from having parents from a lower economic level, there were no data to compare. Therefore, Hypothesis No. 15 did not receive consideration.

Hypothesis No. 16

This hypothesis stated that reading achievement in the clinical program will be inhibited by the lack of...
support for schools by the parents of the subject. Table 15 shows the results of the analysis of the data.

Table 15

Analysis of the Data Between Subjects with Parents who Demonstrated a Lack of Support for Schools and Subjects with Parents who Supported Schools

<table>
<thead>
<tr>
<th>Subjects with Anomaly</th>
<th>N</th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>181</td>
<td>9.1</td>
<td></td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>27</td>
<td>264</td>
<td>9.8</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects without parents who demonstrated a lack of support for the schools. Therefore, Hypothesis No. 16 was sustained.

Hypothesis No. 17

This hypothesis stated that reading achievement in the clinical program will be inhibited by the lack of exposure to reading of the subject within the home. Because there were no subjects in this study who were not exposed to reading, there was no data to compare. Therefore, Hypothesis No. 17 did not receive consideration.
Hypothesis No. 18

This hypothesis stated that reading achievement in the clinical program will be inhibited by the ordinal position of the subject within his family other than first born or only child. Table 16 shows the results of the analysis of the data.

Table 16

Analysis of the Data Between Subjects Afflicted with Ordinal Position Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th></th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with Anomaly</td>
<td>35</td>
<td>316</td>
<td>9.0</td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>12</td>
<td>129</td>
<td>10.8</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects who were first born or only children. Therefore, Hypothesis No. 18 was sustained.

Hypothesis No. 19

This hypothesis stated that reading achievement in the clinical program will be inhibited by rivalry between the subject and his siblings. Table 17 shows the results of the analysis of the data.
Table 17

Analysis of the Data Between Subjects Afflicted with Sibling Rivalry Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with Anomaly</td>
<td>14</td>
<td>103</td>
<td>7.4</td>
<td></td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>33</td>
<td>342</td>
<td>10.4</td>
<td>3.0</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects without a rivalry between the subject and his siblings anomaly. Therefore, Hypothesis No. 19 was sustained.

Hypothesis No. 20

This hypothesis stated that reading achievement in the clinical program will be inhibited by the large family size of the subject. Table 18 shows the results of the analysis of the data.
Table 18

Analysis of the Data Between Subjects Afflicted with Family Size Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with Anomaly</td>
<td>16</td>
<td>127</td>
<td>7.9</td>
<td></td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>31</td>
<td>318</td>
<td>10.3</td>
<td>2.4</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects without a large family. Therefore, Hypothesis No. 20 was sustained.

**Hypothesis No. 21**

This hypothesis stated that reading achievement in the clinical program will be inhibited by the marital instability of the parents. Table 19 shows the results of the analysis of the data.
### Table 19

Analysis of the Data Between Subjects Afflicted with Marital Instability of the Parents Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th></th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with Anomaly</td>
<td>6</td>
<td>38</td>
<td>6.3</td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>41</td>
<td>407</td>
<td>9.9</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects without a marital instability of the parents anomaly. Therefore, Hypothesis No. 21 was sustained.

**Hypothesis No. 22**

This hypothesis stated that reading achievement in the clinical program will be inhibited by the lack of a Kindergarten experience. Because there were no subjects in this study who did not attend Kindergarten, there were no data to compare. Therefore, Hypothesis No. 22 did not receive consideration.

**Hypothesis No. 23**

This hypothesis stated that reading achievement in the clinical program will be inhibited by a change of
schools in the primary grades by the subject. Table 20 shows the results of the analysis of the data.

Table 20

<table>
<thead>
<tr>
<th>Subjects</th>
<th>N</th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects with Anomaly</td>
<td>31</td>
<td>264</td>
<td>8.5</td>
<td></td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>16</td>
<td>181</td>
<td>11.3</td>
<td>2.8</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects without a change of schools in the primary grades by the subject anomaly. Therefore, Hypothesis No. 23 was sustained.

Hypothesis No. 24.

This hypothesis stated that reading achievement in the clinical program will be inhibited by absenteeism of the subject. Table 21 shows the results of the analysis of the data.
Table 21
Analysis of the Data Between Subjects Afflicted with Absenteeism Anomaly and Subjects Not Afflicted

<table>
<thead>
<tr>
<th>Subjects with Anomaly</th>
<th>N</th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Difference in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8</td>
<td>85</td>
<td>10.6</td>
<td></td>
</tr>
<tr>
<td>Subjects without Anomaly</td>
<td>39</td>
<td>360</td>
<td>9.2</td>
<td>1.4</td>
</tr>
</tbody>
</table>

There was a difference between the two groups in favor of the subjects with an absenteeism anomaly. Therefore, Hypothesis No. 24 was rejected.

Hypothesis No. 25

This hypothesis stated that reading achievement in the clinical program will be inhibited in proportion with the number of anomalies identified with the subject. Table 22 shows the results of the analysis of the data.
Table 22
Analysis of the Data Among Subjects Afflicted with Different Anomaly Totals

<table>
<thead>
<tr>
<th>Number of Anomalies</th>
<th>N</th>
<th>Total Point Gain</th>
<th>Mean Point Gain</th>
<th>Differences in Point Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. 3-6</td>
<td>8</td>
<td>103</td>
<td>12.88</td>
<td></td>
</tr>
<tr>
<td>B. 7-10</td>
<td>29</td>
<td>289</td>
<td>9.97</td>
<td></td>
</tr>
<tr>
<td>C. 11-15</td>
<td>10</td>
<td>53</td>
<td>5.30</td>
<td></td>
</tr>
<tr>
<td>Between Groups A and B</td>
<td></td>
<td></td>
<td></td>
<td>2.91</td>
</tr>
<tr>
<td>Between Groups A and C</td>
<td></td>
<td></td>
<td></td>
<td>7.58</td>
</tr>
<tr>
<td>Between Groups B and C</td>
<td></td>
<td></td>
<td></td>
<td>4.67</td>
</tr>
</tbody>
</table>

There were differences among the three groups always in favor of the group with the fewer number of anomalies.

Therefore, Hypothesis No. 25 was sustained.
Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

SUMMARY

This study investigated possible inhibiting factors related to the reading achievement of selected clinical subjects.

Justification for the study was based on general agreement among reading specialists that diagnosis of the disabled reader must proceed beyond testing of strengths and weaknesses in reading achievement and that it should investigate possible causal factors of reading disabilities.

It was anticipated that if the relationship of the importance of inhibiting factors as they are related to reading achievement was determined, then prescriptions for future students would be enhanced.

The 47 subjects, ranging in age from 6 to 15 years, were primary and older students from a middle-class, socio-economic background who attended CRC 1976 summer sessions. Initial diagnosis indicated that the primary students were at least one year below their reading potential and the older students were at least two years below their reading potential. Their actual grade-placement ranged from first to ninth grade.
This investigator was a reading therapist at CRC during the summer of 1976. Eight of the subjects were students in his classes. The investigator was responsible for determining the prescription for and posttesting these eight subjects.

Because of the size of the sample and the absence of random selection, the data were not treated statistically. A mean point gain was determined for the subjects with a specific anomaly and for the subjects without the same, specific anomaly. The two means were compared. In each instance the hypothesis was accepted when the anomaly group mean was lower and was rejected when the anomaly group mean was higher. However, the findings were non-statistical and, therefore, are tentative.

CONCLUSIONS

The findings of the present study generally support the literature. Certain anomalies appear to have more of an effect on reading achievement indicating a relationship between the importance of inhibiting factors and reading achievement.

The tentative findings of the study indicate that:

1. Psychological factors influence reading achievement more than physical factors.

2. Physical factors influence reading achievement more than social factors.
3. Auditory discrimination is the single, most influential factor on reading achievement.

4. Those afflicted with the greatest number of anomalies achieve less than those with the fewest number of anomalies.

5. Certain anomalies do not hamper reading achievement.

RECOMMENDATIONS FOR FURTHER RESEARCH

In view of the findings of the present study, the following areas are recommended for further research:

1. Replication of the findings of this study.

2. The effect of psychological factors on reading achievement.

3. The effect of physical factors on reading achievement.


5. The effect on reading achievement of subjects with the greater amount of anomalies compared to subjects with fewer anomalies.

6. The effect of language development on reading achievement.

7. The effect of absenteeism on reading achievement.


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Dittman, Donald R. "Reading Clinics--Success or Failure?" *Educational Leadership*, 31 (1974), 710-11.


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Harris, Albert J. How to Increase Reading Ability. 5th ed. New York: David McKay, 1970.


Harris, Albert J. How to Increase Reading Ability. 5th ed. New York: David McKay, 1970.


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JRB. "Homing in on Sex Differences in Reading," The Reading Teacher, 29 (1976), 741-2.


Lawrence, Denis. "Remedial Reading and Counselling," Reading (UKRA), 9 (1975), 12-7.


Misner, Marilyn S. "The Effect of Frequent Geographic Mobility on the Reading Achievement of Students in a Military Community." Unpublished PhD dissertation, University of Illinois at Urbana-Champaign, 1972.


Murray, Michael E. "A Study of Personality, Prolonged Reading Failure, and Early Success in Initial Remedial Language Training in Children with Specific Reading Disabilities." Unpublished PhD dissertation, University of Texas Health Science Center at Dallas, 1974.


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Zimet, Sara G. "Reader Content and Sex Differences in Achievement," The Reading Teacher, 29 (1976), 758-63.


APPENDIX A

READING MANAGEMENT SYSTEMS
READING MANAGEMENT SYSTEMS

Bookmark Diagnostic System (for Bookmark Reading Program)
Harcourt Brace Jovanovich
757 Third Avenue
New York, N.Y. 10017

Classroom Management System (for Design for Reading), 1974
Harper and Row Publishers, Inc.
School Department
2500 Crawford Avenue
Evanston, Ill. 60211

Criterion Assessment Test (C.A.T. for Basic Reading), 1975
J.B. Lippincott Co.
East Washington Square
Philadelphia, Pa. 19105

Croft Inservice Reading Program: Reading Comprehension Skills, 1975
Croft Inservice Reading Program: Word Attack Skills, 1971
Croft Educational Services
100 Garfield Avenue
New London, Conn. 06320

Diagnosis: An Instructional Aid, 1973
Science Research Associates, Inc.
259 E. Erie Street
Chicago, Ill. 60611

Fountain Valley Teacher Support System, 1971
Richard L. Zweig Associates
CRT Division 10
20800 Beach Blvd.
Huntington Beach, Ca. 92648

High Intensity Learning System, 1974
Random House, Inc.
School Division
201 E. 50th
New York, N.Y. 10022

Individualized Criterion Reference Testing (ICRT)
Educational Progress
24831 Via Larga
Laguna Miguel, Ca. 92677
Individual Pupil Monitoring System, 1974
Houghton Mifflin Co.
777 California Avenue
Palo Alto, Ca. 94304

Language Arts Instructional Materials System
Craig Education
921 W. Artesia Blvd.
Compton, Ca. 90220

Plan, 1973
Westinghouse Learning Corporation
P.O. Box 30
Iowa City, Iowa 52240

Power Reading System, 1973-74
Winston Press, Inc., Publisher
Distributed by:
BFA Educational Materials
2211 Michigan Avenue
Santa Monica, Ca. 90404

Prescriptive Reading Inventory, 1972
CTB/McGraw-Hill
Del Monte Research Park
Monterey, Ca. 93940

Ransom Program, 1974-75
Addison-Wesley Publishing Co.
2725 Sand Hill Road
Menlo Park, Ca. 94025

Reading 360 Management System, 1973
Ginn and Company
191 Spring Street
Lexington, Mass. 02173

Read-On, 1971
Random House, Inc.
School Division
201 E. 50th
New York, N.Y. 10022

S.A.R.I., 1972
Phi Delta Kappa, Inc.
P.O. Box 789
Bloomington, Indiana 47401

Scott Foresman Reading System
Scott Foresman and Company
855 California Avenue
Palo Alto, Ca. 94304
Skills Monitoring System: Reading, 1975-76
Test Department
Harcourt Brace Jovanovich
757 Third Avenue
New York, N.Y. 10017

Systems F.O.R.E., 1972
Special Education Department
L.A. Unified School District
Los Angeles, Ca.

The Read System
American Book Co.
399 Adrian Road
Milbrae, Ca. 94030

Wisconsin Design for Reading Skill Development, 1972
NCS/Interpretive Scoring Systems
4401 West 76th Street
Minneapolis, Minn. 55435
APPENDIX B

CHILD STUDY FORM
CAMARILLO READING CLINIC
CHILD STUDY FORM

(Use back of this sheet if necessary to complete any answer.)

Name of child ___________________ Address ___________________
Birthdate ___________________ Age ___ ________________________________
School Grade ___________________ Phone ________________________________
Father's Name ___________________ Mother's Name ____________________
School ___________________________ Teacher or Counselor ________
Referred by __________________________ ________________________________

I. School History

Did child attend nursery school? ____________________________

Did child attend kindergarten? ____________________________

Did child repeat or skip any grades? ____________________________

If so, explain: ____________________________________________

Schools attended: ____________________________ Grades: ____________________________ Progress or success?

__________________________________________

__________________________________________

__________________________________________

Has child ever been absent from school for an extended period? ____________________________

If so, explain: ____________________________________________

In what grade did reading (math) problem first develop? ____________________________

How or why (explain)? ____________________________________________

Present difficulties? ____________________________

Has child received help with reading (math)? ______ When? ______

For how long? ______ From whom? ____________________________

Of what nature? ____________________________ Results? ____________________________

Is present school giving special help? ______ What? ____________________________

Does child have difficulty with any other school subjects? ____________________________

If so, which subjects? ____________________________

Does child like other school subjects? _____ Which ones? ____________________________

Has the child ever had any psychological or intelligence tests? ____________________________

If so, by whom? ____________________________ When? ____________________________

Has the child ever had speech therapy? ______ When? ____________________________

Where? ____________________________ Results? ____________________________

Are you satisfied with the school? ______ Explain: ____________________________

Describe child's relationship with present teacher: ____________________________

Previous teachers: ____________________________

What is child's present attitude toward school? ____________________________
II. Physical History

Who is the child's physician? ________________________________

Date of most recent physical exam: ________________

What is the child's general health status (colds, sore throats, fatigue, nausea, underweight, etc.)? ________________

Is child under the care of a physician for any reason? ________________________________

If so, explain: ________________________________________________

Does child take medication of any kind? __________________________

When were the child's eyes last examined? ______ Where? ____

By whom? _____________________ Results? ________________

Has child ever had an audiometer test? ______ When? ________________

Where? _____________________ Results? ________________

Was child premature? ______ Were there any complications during pregnancy? ______ Explain: __________________

Was child's birth difficult? ______ If so, explain: ________________

Has child ever had convulsions? ______ Seizures? ______

If so, explain: ________________________________________________

Other serious illness, accidents, or operations:

<table>
<thead>
<tr>
<th>Age</th>
<th>Severity</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

At what age did child first sit up? ______ Crawl? ________________

Walk? ________________________________

At what age did child first utter single words? ______ Phrases and sentences? ________________ Did child ever stammer or stutter? ______ Explain: __________________

Any present speech difficulties? ________________________________

Outstanding traits as a child (slow or early development): ______

Is child right-handed? ______ Left-handed? ______

Ambidextrous? ______ Was any attempt made to change the child's handedness? ______ Explain: __________________

Did child ever have trouble with cutting? ______ Pasting? ______

Writing? ______ Coordination? ________________________________

Any other fine or gross motor skills? ____________________________
III. Social and Emotional History

How many playmates and friends does child have? __________
Ages? __________
Are child's relationships with other children good? __________
Why or why not? __________
Does child show aggressiveness? __________ Leadership? __________
How? __________
Does child ever have crying spells? __________ Nightmares? __________
Unusual fears? __________ Temper tantrums? __________
Seem depressed or anxious? __________
If so, explain: __________
Does child walk or talk in his sleep? __________
Does child wet the bed? __________
How does child react to failure? __________
To success? __________

IV. Attitudes and Interests

Does child enjoy sports? __________ At which sports is child proficient? __________ Poor? __________
Does child take music lessons? __________ Dancing lessons? __________
Others? __________
Did child enjoy nursery rhymes? __________ Picture books? __________
Having stories read to him? __________
About how many books does child own? __________ Magazines? __________
Comics? __________ Other? __________
What reading interests does the child have now at home? __________
At school? __________
What reading is done to him by his parents? __________
How often? __________
What responsibilities does he accept and perform with regularity? __________

What works well in getting him to do things at home? __________
Not well?
Is child excessively fond of television? __________
How does he spend his time at home? __________
What interests, hobbies, or activities does he have now? __________

Does child have any special aptitudes? __________
How would you describe child's present attitude toward reading? __________
V. Family History

Father: Age ______ Occupation _______ Education _______
Mother: Age ______ Occupation _______ Education _______

Parent's marital status: ___________________________________________________________

Is this an only child? _________ If not, list:

Brother's Names: ________________________________________________________________
                        age __ gr. ___                        age __ gr. ___
                        age __ gr. ___                        age __ gr. ___
                        age __ gr. ___                        age __ gr. ___

Sister's Names: ________________________________________________________________
                        age __ gr. ___                        age __ gr. ___
                        age __ gr. ___                        age __ gr. ___
                        age __ gr. ___                        age __ gr. ___

Do any of the brothers or sisters have reading problems? _________________________

Are any of them exceptionally good readers? ________________________________

How would you describe the child's relationships with his brothers and sisters? __________

Do grandparents or other relatives live in the home? _____________________________

By whom is the child usually disciplined? ________________________________

How? _______________________________________________________________________

Any difference of opinion between parents? ________________________________

In what respects? _______________________________________________________________________

Describe father's relationship with the child: ______________________________

Describe mother's relationship with the child: _____________________________

Who helps the child with his homework? _______________________________________ 

Is more than one language spoken in the home? ______________________________

Any unusual events during early childhood? Any problems in home conditions (finances, relatives, religion, companions for child)? _______________________________________________________________________

VI. List any factors which you think might have contributed to the child's reading (math) problems:

Date: ____________________________

Name of person filling out questionnaire: ________________________________

Relationship to child: ________________________________

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APPENDIX C

DIAGNOSTIC TEST SUMMARY
CAMARILLO READING CLINIC
DIAGNOSTIC TESTING NOTES

Name ________________________ Age ______ Grade ______ 
Birthdate ____________________ Date of Testing ____________ 
School ______________________ Teacher __________________
Remedial Reading _____________ Reading Book _____________

General Observations: 
Speech _______ Hearing _______ Vision _______ 
Hand _______ Eye _______ Foot _______

Interests: 
Subjects Liked   Subjects Disliked   Hobbies & Activities

TEST PROFILE:

<table>
<thead>
<tr>
<th>Name of Test</th>
<th>Errors and Observations</th>
<th>Materials</th>
<th>Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIT</td>
<td></td>
<td></td>
<td>M.A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I.Q.</td>
</tr>
<tr>
<td>Wepman Auditory Discrimination</td>
<td>Initial Cons.</td>
<td>Final Cons.</td>
<td>Vowels</td>
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<td>Adequate</td>
<td>Borderline</td>
<td>Inadequate</td>
</tr>
<tr>
<td>Visual Perception</td>
<td>Reversals:</td>
<td>Inversions;</td>
<td>Perceptonyms:</td>
</tr>
<tr>
<td></td>
<td>Adequate</td>
<td>Borderline</td>
<td>Inadequate</td>
</tr>
<tr>
<td>Phonics Inventory</td>
<td>Consonants</td>
<td>Short V.</td>
<td>Blends</td>
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<td></td>
<td>Adequate</td>
<td>Borderline</td>
<td>Inadequate</td>
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<tr>
<td>Structural Analysis Inventory</td>
<td>Compounds</td>
<td>Contractions</td>
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<td>Borderline</td>
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Syllables - Plurals - Possessives - Affixes
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<th>Errors and Observations</th>
<th>Materials</th>
<th>Scores</th>
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<tbody>
<tr>
<td>Basic Sight Vocabulary</td>
<td></td>
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<td>Adequate _____</td>
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<td></td>
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<td>SORT</td>
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<td></td>
<td></td>
<td>Unpredictable</td>
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<tr>
<td></td>
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<td>Total ___</td>
</tr>
<tr>
<td>Silent Reading</td>
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<td>Vocabulary ___</td>
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<td></td>
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<td></td>
<td>Comprehension</td>
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<tr>
<td>Math</td>
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<td>Timed _____</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Untimed ____</td>
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<tr>
<td>Other</td>
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Recommendations:

Comments and Suggestions:

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APPENDIX D

PUPIL PROFILE FORM
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<thead>
<tr>
<th>Name</th>
<th>Birthdate</th>
<th>Age</th>
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<tbody>
<tr>
<td>School</td>
<td>Grade</td>
<td>Class Time</td>
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<tr>
<td>Teacher</td>
<td>Therapist</td>
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Enrolled for: Reading ___ Math ___ Combination ___

**TEST PROFILE**

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<thead>
<tr>
<th>Slosson</th>
<th>SORT</th>
<th>Silent</th>
<th>Math</th>
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<tr>
<td>I.Q. ___</td>
<td>Pred.</td>
<td>Voc.</td>
<td>Timed</td>
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<tr>
<td>Range</td>
<td>Unpred.</td>
<td>Comp.</td>
<td>Untimed</td>
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**ATTENDANCE**

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**INSTRUCTIONAL LEVEL**

<table>
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<tr>
<th>Reading (Math) Weaknesses:</th>
<th>Materials and/or Methods:</th>
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