

A DESCRIPTION OF LANGUAGE PROCESSING CHARACTERISTICS
OF SELECTED SECONDARY STUDENTS WITH READING
AND SPELLING DIFFICULTIES

By

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CHAPTER I

PRESENTATION OF THE PROBLEM

Introduction

Since the early part of the twentieth century, technological advancements have revolutionized all aspects of society. In this milieu of rapid intellectual and scientific change, a segment of our society, the intellectually able students who have failed to master basic reading and spelling skills, do not fit. They are aliens in an academic structure that has failed to understand and provide for their uniqueness. This same structure requires them to remain in school where failure is reinforced by daily objectives that they cannot meet and periodic achievement evaluations that proclaim their failure.

Prior to World War II, students with reading and spelling problems resulting in school failure usually chose to drop out of school and seek employment. According to Durrell (1956) it was not unusual for students who made inadequate progress in first grade to be "held back" one or two years. Unless they met the predetermined standards for second grade, they were again "held back." By the time they reached the middle elementary grades they were old enough to drop out and find employment. This practice worked so well that one seldom heard of reading difficulties. That approximately one-half of entering first grade students dropped out of school by the end of the sixth grade was not recognized as a school related problem. The conscience

of the educated segment of the community was somewhat salved by its acceptance of the normal bell curve that justified a percentage of failure regardless of the school's instructional environment.

Nile Banton Smith (1961), in an address to the National Council of English Teachers, outlined fifty years of progress in reading instruction beginning with the 1910 to 1920 decade. According to Smith, World War II had only two immediate effects on reading: one being fewer reading investigations and the other being the shocking discovery that thousands of young men in the military service could not read well enough to follow simple camp life directions. When it was found that many of these reading deficient young men could be taught to read and write in a relatively short time, educators were confronted with a dichotomy between established educational practices and the demands of those previously kept on the fringe of public education.

The successful experiences of the returning World War II veterans to the college campuses are well documented. Many academically unprepared soldiers made good students. Educational dogmas with decisive parameters identifying those who were expected to be successful adults based on early school achievements were challenged.

In 1969, James E. Allen, Jr., United States Commissioner of Education, set a national goal for the 1970's declaring that reading instruction would be given top priority in the nation's schools. He expressed the hope that by the end of the 1970's no student would leave high school without adequate reading skills. In order to make this a reality vast changes were made in the instructional programs for the ten to thirty percent who were not reading well enough to be successful

in school or in a technological society (Karlin, 1975). Allen's "Right to Read" slogan permeated all areas of education. Money for special instruction was added to the operating funds of most public schools.

Concentration in the early part of the 1970's was on intervention and remediation at the pre-school, primary and elementary levels. The rationale for this was that if instruction and programs were concentrated on the young child there would be only minimal reading problems among these students as they grew older.

A more mature reading profession had to face reality by the middle of the 1970's when it was apparent that stopgap measures and quick solutions had not been enough. The Educational Testing Service (1978) which was set up to periodically sample the nation's nine, thirteen, and seventeen-year-olds to see how well they could read, write, and compute, reported:

. . . in the spring of 1977, thirteen percent of seventeen-year-olds were unable to comprehend such simple material as street signs, store coupons, telephone directories, or driver's license tests. They were, in short, functionally illiterate. Fully half of them could not read materials intended for college freshmen (pp. 1-2).

Farr (1978) reported that while students in the lower grades were reading better than those in 1970, students at the upper levels were not reading any better and maybe not as well as students in 1970. The problems to be solved are obviously more complex than the surface arguments over whether phonics instruction is superior to whole word instruction or whether or not innovative programs are more successful than traditional ones. The components that seemed to have been given

only cursory notice were an understanding of students as individuals and the type of learning environments that would encourage the potential within them to be developed.

Need for Study

A number of studies have dealt with the student who is severely disabled in reading and spelling. Schwartz and Doehring (1976) studied the morphological and orthographic spelling-pattern abstraction of good and poor spellers and concluded that good spellers were ahead of poor spellers in pattern development. They also found an orderly progression of pattern development for both groups with the poor spellers lagging behind about two years. Mitchell's study (1976) using a psycholinguistic analysis of oral reading errors found error patterns to be highly individualistic and stated that group evaluations could easily mask the variations between individuals.

Allington, Gramley and Truex's study (1976) found that the difficulty encountered by poor readers on visual tasks involving high frequency, low discriminability words is the verbal processing association rather than the frequently cited "perceptual deficit hypothesis."

Fruenheim (1978) conducted a follow-up study of forty adult males who were diagnosed as being severely language disabled in childhood and found that the subjects continued to exhibit in adulthood severe difficulties in areas of reading, spelling and arithmetic.

A relationship was established between Wechsler Intelligence Scale for Children, Verbal-Performance Scale IQ discrepancy and reading and spelling retardation in two investigations conducted

by Nelson and Warrington (1974). They also found an error pattern distinction between subjects classified as reading plus spelling retardates and those whose spelling achievement was significantly lower than reading achievement.

Boder (1973) assessed over one-hundred third through tenth grade dyslexics and identified three subtypes based on reading-spelling patterns. She found the correlation between a subject's pattern of reading and pattern of spelling so consistent that one is predictive of the other. Camp and Dolcourt (1977) designed two parallel standardized reading and spelling forms based on Boder's work and found Boder's atypical spelling and reading error patterns to be significantly more common in average and low readers.

Ross (1975) found limited research that led to teaching suggestions appropriate for the learning disabled. Particularly lacking were studies identifying profiles of language processing strategies that are characteristic of hard core language disabled secondary students. Investigations that have implications for researchers as well as practitioners are even harder to find.

Studies are urgently needed which provide ways to identify the severely disabled reading and spelling students; which describe their language processing characteristics, and which provide directions for instructing them. This investigation will attempt to identify language disabled secondary students and to develop a profile of characteristics that will have implications for instructional programs.

Purpose of the Study

The purpose of this study is to provide a description of

language processing characteristics as measured by certain instruments of selected secondary students who have not achieved academic success in the classroom because of limited reading and spelling skills. This study is specifically concerned with the intellectually capable students who have not developed reading and spelling skills appropriate for their level of ability.

Statement of the Problem

The present investigation was designed to examine the reading and spelling processing strategies of selected secondary students who, though otherwise intellectually normal, are unable to succeed academically in subjects requiring efficient language processing skills.

This investigation has been designed to:

- (1) Determine the verbal, performance and full scale IQ's for each subject as well as the mean for each of the scales.
- (2) Determine the percentage of subjects with the verbal and performance scale scores of the individualized intelligence test being fifteen or more points different and those with similar verbal and performance scale scores.
- (3) Determine each subject's estimated reading expectancy grade level and the group mean.
- (4) Determine each subject's silent reading grade score on a vocabulary test where words were presented in isolation and the group mean.
- (5) Determine each subject's silent reading grade score on a comprehension test that allowed context clue utilization and the group mean.
- (6) Determine each subject's oral reading grade score and the group mean.

- (7) Determine each subject's oral reading error analysis pattern and the group mean for each error pattern.
- (8) Determine each subject's word recognition vocabulary reading grade score and the group mean.
- (9) Determine each subject's spelling efficiency percentage.
- (10) Determine each subject's spelling error analysis classification.
- (11) Determine the discrepancy between each subject's present grade placement and obtained reading achievement grade scores in this investigation.

Selection of Subjects

The subjects for this study were selected from Central State University Reading Clinic, Edmond, Oklahoma, and from the Oklahoma Child Service Demonstration Center, Cushing, Oklahoma. Twenty-six subjects met the selection criteria listed below:

- (1) All subjects had a minimum chronological age of thirteen years.
- (2) All subjects were identified by one of the special centers as being intellectually average (minimum IQ, 90) or above average as determined by the individual intelligence test.
- (3) All subjects were informally observed by teachers or clinicians to be free from gross mental, physical or emotional handicaps that would contribute to the learning difficulty.
- (4) All subjects use English as their primary language.
- (5) All subjects had previously been administered a battery of tests by Central State University Reading Clinic or Oklahoma Child Service Demonstration Center that identified them as being three or more years retarded in reading and/or spelling achievement.

Definition of Terms

Intellectually able: Students who score within or above the average range of intellectual functioning (minimum IQ 90) on the Wechsler Intelligence Scale for Children-Revised or the Wechsler Adult Intelligence Scale.

Severely language disabled: Students who are intellectually able to be successful academically but who achieve significantly below their ability level in reading and spelling related areas.

Secondary student: Students who are at least thirteen years of age and are enrolled in grades seven through twelve.

Language processing: The act of interpreting the phoneme-grapheme relationship in a language environment that possesses semantic, syntactic, morphological and orthographic qualities.

Estimated reading expectancy grade level: The process of estimating reading expectancy age and grade level using a formula suggested by Harris (1975, p. 212) that gives mental age twice the weight of chronological age.

Dysphonetic: Individual whose reading-spelling patterns reflect primary deficit in symbol-sound (grapheme-phoneme) integration resulting in the inability to develop efficient phonetic word analysis-synthesis skills.

Dyseidetic: Individuals whose reading-spelling patterns reflect primary deficit in the ability to perceive letters and whole words as configuration or visual gestalts and thus produce inexact letter arrangements and sequence of letters.

Mixed dysphonetic-dyseidetic: Individuals whose reading-spelling patterns reflect primary deficit both in the ability to develop phonetic

word analysis-synthesis skills and in the ability to perceive letters and whole words as visual gestalts. Subjects classified as mixed dysphonetic-dyseidetic are usually the least likely to respond quickly to remedial instruction.

Assumptions

It is assumed that the instruments used in this study actually measure the factors they are designed to measure and that their use is appropriate for this study. It is also assumed that the subjects are representative of the reading disabled secondary school population in north central Oklahoma who have been or are currently enrolled in a diagnostic-prescriptive type remedial reading program.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The literature in this chapter will cover the areas that are considered by the researcher to contribute to an understanding of the problem being investigated. Included are selected writings and studies concerning the intellectually able students who have experienced difficulty in learning to read and spell in the traditional educational environment. Also included are investigations and professional writings that describe the intellectual, emotional and language processing characteristics of these students.

The ability to read and write has always been held in highest regard by societies who value literacy. Among early civilizations the act of reading was often considered a mystery that was reserved for a few people which elevated them to positions of authority.

Huey (1908) discussed the status of being able to read when he wrote:

Written language became the currency of civilization and so of learning and education. It was thought of as value in itself, and most commonly the church "kept the bag." . . . through this mystery of the printed word and this reverence for reading and the books it came about that learning and education have ever been more or less holy things . . . the learned man is a "man of letters" while the ignoramus is "unlettered." To say that one cannot read and write is to outlaw him in the commonwealth of learning (p. 3).

Norton's (1951) translation of the Education of Man by Pestalozzi, an innovative educator of the eighteenth century, contains an introduction by Kilpatrick lauding Pestalozzi for instilling in the classroom the spirit of opportunity and the respect for individuality. Pestalozzi recorded his opposition to the teaching practices of his day that produced academic failure followed by flogging when students failed. He advocated a logical theory of learning, which he called "Anschauung," providing for concrete observations with each learning task, a contrast to rote memorization and extensive written examinations. Franks (1947) wrote of Albert Einstein's experiences in the school at Aarau, Switzerland, a Pestalozzian influenced school, where young Einstein was able to develop the reading and writing skills that he had failed to acquire in the pedantic German schools that he had attended until age fifteen.

Shortly before 1900, medical literature began to reveal a concern for the intelligent but reading disabled individual. Between 1896 and 1902 (Critchley, 1970), Henshelwood contributed a series of case reports concerning "congenital word-blindness." In 1917, he published his second monograph entitled "Congenital Word-Blindness." That such a condition did or did not exist was debated with one position being in defense of "word blindness" produced by a structural brain defect, and the other position postulating a developmental delay of function.

In 1925, Samuel Orton, a neuropathologist, published his conclusions concerning the physiology of the brain and its relationship to reading, writing and speech difficulties in children. Orton (1928) wrote that he was from the first strongly impressed with the idea that specifically retarded readers formed a homogeneous group differing only

in the degree of their handicap and not in their type. Orton's theory of cerebral dominance and reading problems was accepted by some and rejected by others. Goldberg and Schiffman (1972) stated:

The notion of cerebral dominance owes its origin to the discovery that a loss of speech almost always results from lesions of the left hemisphere . . . sufficient evidence has been accumulated to indicate that cerebral dominance and poorly defined laterality are not related to learning disorders . . . the peripheral lack of consistent dominance does not indicate the cause of a learning difficulty, but merely a corollary associated with central dysfunction or with the etiological factors (p. 137).

Arthur Gates (1922) wrote of the early attempts of the medical profession to find explanations for the failure of some seemingly intelligent individuals to learn to read or to spell. The literature contains reports of medical diagnoses such as "congenital work-blindness," "alexia," "congenital aphasia," or "mind-blindness." Within this medical context it was assumed that visual memories of words and letters were processed in different areas of the cerebral cortex. If the individual experiencing the language difficulty did not have ocular or obvious organic defects and if he were judged to be intelligent, he was thought to have a congenital defect in the cortical area. With this diagnosis, the prognosis was usually hopeless.

The Scarborough, New York investigation into reading and spelling disabilities conducted by Gates (1922) sought to delineate causation more accurately than had previously been done. The Scarborough study acknowledged a wide range of causation and expressed an appreciation for the complexity of the reading task.

In the study there were 105 subjects with at least 25 of these

being identified by teachers as "severely language disabled." Group and individual intelligence tests were administered. The test battery also included reading achievement as well as diagnostic tests. Each subject was given a vision and hearing test. Some of the major conclusions were: (1) when investigating the "backward reader or speller" the first step should be a measure of general ability using an individually administered test because group intelligence tests were found to be unreliable for the "backward reader," (2) the correlation between the Stanford-Binet Mental Age score and reading goes up regularly from 0.30 for grade three to 0.71 for grade seven, (3) the correlation between reading and spelling were found to be high, (4) backwardness in reading almost invariably was accompanied by backwardness in spelling although backwardness in spelling was not always evidence of backwardness in reading, (5) if perceptual abilities are so inappropriate as to make reading difficult, the effect on spelling is very marked, (6) when perceptual abilities are satisfactory for reading they may still be insufficiently precise for perceptible assistance in spelling, and (7) cases of backwardness in spelling were found even when perceptual reactions to words seemed better than average.

Monroe (1932) was a pioneer in the effort to differentiate between atypical students who did not learn to read or spell, even though they had adequate intellect, and normal students. In order to obtain a single measure of reading defect, Monroe secured a mental age, chronological age and an arithmetic score. She translated these into grade equivalents and averaged them. A reading achievement grade score was obtained by administering to each subject (1) Gray's Oral Reading

Examination, (2) Haggerty Reading Test or the Monroe Silent Reading Test, (3) Iota Word Test, and (4) Word Discrimination Test. She averaged the reading achievement scores and compared her findings with the average of the chronological age, mental age and arithmetic score. She calculated a reading index or quotient by dividing the pupil's reading grade by the expectancy score. In this way, Monroe sought to determine the degree of retardation or acceleration in reading.

Betts (1936) an early advocate of differentiating between disabled readers and inadequate readers with low intellect wrote:

. . . research workers have provided enough evidence to relieve us of our sinister feelings and helplessness regarding children who are unadjusted in the reading program . . . children who have difficulty in learning to read can conveniently be divided into two classes: (1) those who are below normal on the basis of general ability, i.e., of low intelligence, and (2) those who present specific learning disability in reading . . . it is usually estimated that from eight to fifteen percent of the school population is characterized by varying degrees of reading disabilities (p. 1).

According to Betts, serious reading difficulties are characterized by a constellation of difficulties requiring a detailed analysis by a trained and understanding worker. He suggested that the analysis of a case of reading disability calls for an evaluation of oral and silent reading habits and of certain individual capacities. Among those suggested by Betts were general achievement tests, readiness tests, intelligence tests, and tests of specific reading skills. In addition, he emphasized the importance of utilizing a trained examiner who would be able to note behavioral factors that contributed to the reading difficulties. Betts suggested that an evaluation of oral

reading errors should be included in the diagnostic procedure for severely disabled readers. He identified twelve categories or error patterns that should be noted.

Gray (1922), Betts (1936) and Durrell (1933) were major contributors of research concerning able and disabled readers. Gray's Standardized Oral Reading Paragraph Test (Grades I-VIII) and Durrell's Procedure for the Analysis of Reading Difficulties, were designed to provide a standard method of observing the difficulties and faulty habits of children who are retarded in reading.

Robinson's study (1946) represented a milestone in the progress of research concerning the causes of reading failure due to the longitudinal nature of the investigation and the interdisciplinary approach. She concluded that reading failure had multiple causation with some of the implications being: (1) home and family relationships are an important part of severe reading retardation, (2) emotional maladjustments were found to be a cause of reading disability, (3) visual difficulties, a center of previous dispute, were found to cause reading failure in a significant percentage of the cases, (4) binocular incoordinations were found more frequently than were any other type of visual anomaly, (5) inappropriate school methods accounted for fewer cases than had been anticipated, (6) neurological difficulties caused failure in a number of cases, (7) speech and functional auditory anomalies appeared to cause failure in a number of cases, (8) endocrine disturbances were responsible for only a few cases but the difficulty was severe when it did occur, and (9) general physical difficulties were responsible for only a few cases of reading failure.

Gates (1941) discussed the research findings of Ladd (1933) and

Challman (1939) concerning the role of personality and emotional factors among students of adequate intellect who are retarded readers and correlated these with his own research. He concluded that personality maladjustment is frequently found to co-exist with reading disability, but that usually it was not possible to tell by the personality behaviors whether the maladjustment is a cause or an effect.

Sylvester and Kunst (1943) reported findings based on work with thirteen children ages eight to thirteen in which psychotherapy alone was used in one case, reading tutoring in eleven cases and reading tutoring followed by psychotherapy in one case. Duration of treatment was from three to eighteen months. They concluded that disturbances in reading are disturbances of the exploratory function and that symptomatic treatment by pedagogical methods is not enough. They stated that tutoring was successful when the tutor intuitively met some of the emotional needs of the student. Pearson (1954) wrote that learning of any kind, but especially the learning of scholastic skills, is a function of the ego. Abrams (1964) suggested that the ego defense employed by the individual will influence whether or not a learning difficulty will occur. He wrote:

. . . reading involves much more than simply the ability to recognize words; it also entails the ability of the reader to bring his experiences to the printed page and to interpret the symbols in light of these experiences . . . if too much mental energy is bound up in defense the student will have little left for the external learning situation. Experience has demonstrated that it is the individual's attention span that suffers under the blow of anxiety and intense feelings (p. 153).

During the 1950's and 1960's the literature contained studies relating reading failure to methodology and the classroom variables.

Chall's study (1967) surveyed fifty years of beginning reading methodology and concluded that phonics based programs helped average and below average children to read more efficiently than programs whose early emphasis stressed meaning. Chall also concluded that the competency of the teacher could make the difference between a student's success and failure. These two conclusions provided additional weight to Flesch's (1955) proclamation that Johnny was failing to learn to read because he was not being taught using a phonics based method.

Durrell (1956) and Smith (1961) discussed the state of reading education prior to World War II when only token notice was given to those students who were "out of step" in the public schools. After World War II, the public was not as accepting of old standards that left many outside the economic benefits awarded those who were the educated privileged.

It was during the 1960's that public schools began to attempt nationwide to face reading problems and traditional "lock-step" reading instruction that did not allow for individual differences. Belden (1966) made a distinction between classroom remedial reading instruction for the junior high student who is retarded from his potential performing level by two or more years and the extremely disabled reader whose reading achievement may be third grade or below. According to Belden, the remedial student's needs can be met in the regular classroom with adequate diagnostic information and instructional modification whereas the extremely disabled student needs more instructional adjustments than can be provided in the classroom. The remedial reader described by Belden and Gray as being a needlessly retarded

reader and the severely disabled reader were acknowledge to represent two very different groups.

De Hirsch, Jansky and Langford (1966) selected a group of tests and produced a predictive index which they believed would significantly reduce the percentage of failure in the upper grades by locating high risk youngsters and providing them with appropriate instruction in the beginning stages of reading.

Clements and Peters (1962) helped establish the term "minimal brain dysfunction" used to describe a grouping of abnormalities referred to as a syndrome. The grouping usually consisted of (1) reading disability, (2) short attention span, (3) history or a presence of left-right confusion in writing, (4) poor motor coordination, and (5) impulsiveness. Each subject was assumed to have his own pattern within the syndrome. Clements and Peters stressed multiple causation including genetic factors, brain damage, enviornmental factors and perhaps a combination of all three. Harris (1975) accepted Clements and Peter's concept but he preferred to call the syndrome "delated and irregular neurological development." He was in favor of eliminating the term "dyslexia" and using instead "reading disability."

Peters (1974) updated his definition of "minimal brain dysfunction" characterizing it as a condition including behaviors such as (1) poor control of attention, (2) poor organization of activity, (3) diminished control of the urge to speak or to act, (4) poor modulation of emotions, (5) subtle deficiencies in the control of movement and tonic stance, and (6) circumscribed deficits in academic functioning which are consistent with the student's level of intellect.

Bond and Tinker (1973) wrote that many reading difficulties could be forestalled by using a preventive program with three instructional components that included (1) a thoroughgoing readiness program in preparing the child for initial reading and for successive higher levels, (2) proper adjustment of instruction to individual differences, and (3) systematic developmental programs at all levels. They also stated that most reading disabilities cases are made and defended this position by stating that reading disabilities are often predisposing conditions within the child that are unrecognized and, as a result, are compounded by extraneous variables such as inappropriate reading instruction and environmental factors that reinforce the individual's feelings of rejection and failure.

Frank Smith (1971) describes the fluent reader as:

a person who is able to make optimal use of all the redundancy available in a passage of text. . one cannot read to reduce both letter uncertainty and word uncertainty at the same time, or word and meaning uncertainty simultaneously. Any attempt to identify individual letters while "reading for words" or to identify words when the aim is comprehension, must inevitably result in delay and disruption of both identification processes (p. 213).

Goodman (1967) described reading as a psycholinguistic guessing game involving an interaction between thought and language. From a slightly different position, Samuels (1976) described reading as a complex skill in which each component part is developed to the level of automaticity. In each stage of skills development Samuels says there are two criteria of achievement: accuracy and automaticity. Until accuracy is well established, the level of automacity cannot be reached.

Vogel (1975) suggested that there are many causation factors contributing to the condition known as reading disability. She believes these factors are on a continuum from a single factor in one student to a cluster in another, and that definitive causation runs in cycles with the most recent concern being in the area of experiences and language differences that contribute to the reading disability. In a study Vogel attempted to identify syntactic abilities in the auditory language of dyslexics and normal children. The basic hypothesis for her study was that dyslexics who have difficulty in reading comprehension are deficient in syntactic abilities when compared to normal children. She concluded that dyslexic subjects are different from normal subjects in syntactic abilities.

Elena Boder (1968, 1973) conducted a study concerning the distribution of reading-spelling patterns among dyslexic children. She selected 61 children seen in the School Neurology Clinics at the Parent-Teacher Health Centers of the Los Angeles City Schools or at Cedars of Lebanon Hospital using the following criteria: (1) all children were of normal intelligence, (2) all were in third grade or beyond, and (3) all were two or more years retarded in reading. She found three distinctive patterns of reading and spelling which she classified as being dysphonetic, dyseidetic and mixed dysphonetic-dyseidetic. Students who are classified as dysphonetic typically have a limited sight vocabulary and even at the secondary level their reading achievement level rarely goes beyond fourth or fifth grade. They are very limited in the ability to utilize sound clusters in word identification or in spelling. Correct spelling is usually limited to words memorized as whole words. Students classified as being

dyseidetic typically have limited memory for words usually resorting to laboriously sounding out each word as if it were new. Words are usually spelled the way they sound and spelling is sometimes not as deficient as reading. Students classified as being mixed dysphonetic-dyseidetic are typically described as being hard core language disabled. Boder states that her classification procedure provides a rational basis for grouping dyslexic students for effective remedial teaching which allows for utilizing strengths and recognizing weaknesses.

Camp and Dolcourt (1977) designed two parallel, standardized reading and spelling forms based on Boder's work and administered them to two groups: a normal sample of 34 students from regular fifth grade classes and a sample of 18 fourth to sixth grade students previously diagnosed as retarded readers. They found Boder's atypical patterns to be significantly more common in average and low readers. They suggested that Boder's procedure would probably be better utilized if standardized materials for reading and spelling were used.

Nelson and Warrington (1974) reported the investigations in which they compared the relationship between the Wechsler Intelligence Scale for Children verbal-performance IQ discrepancy with reading and spelling retardations, and analyzed the spelling errors made by the subjects. They found that children with little or no verbal IQ decrement are on the one hand as retarded in spelling but on the other hand significantly less retarded in reading than subjects with large IQ decrements. They concluded that the degree of verbal IQ decrement is much more strongly associated with the degree of reading retardation.

The second part of the investigation attempted to isolate distinct patterns in the types of errors produced by subjects with spelling difficulties. The subjects were subgrouped according to their absolute reading and spelling retardations. Subgroup 1 contained spelling-only retardates. Subgroup 2 contained subjects with reading-plus-spelling retardation by two or more years. The results confirmed that reading-plus-spelling retardates have significantly lower verbal intelligence than spelling-only retardates. There was a significant difference in the error patterns between the two subgroups.

Wiig, Lapointe and Semel (1977) assessed the relationship among performances on tests of language processing and production by 32 learning disabled adolescents. Intelligence and academic achievement were evaluated prior to the administration of the experimental test battery which was extensive. Some of the areas evaluated were (1) visual reception, association and auditory association, (2) sentence recall using twenty semantically and syntactically varied sentences, (3) verbal opposites, (4) retrieval and naming, (5) spontaneous grouping, (6) sentence production from stimulus words, and (7) word defining. Many of the responses were timed and recorded for analysis. The performance suggested the presence of at least two distinct language deficit syndromes. These were: (1) cognitive-linguistic processings deficits characterized by reduction in morphology and syntax as well as in the comprehension of linguistic concepts, and (2) word retrieval deficits characterized by the subject's inability to produce accurately and rapidly words needed to express an idea.

The educational implications suggested are whether early intervention should be undertaken in order to improve auditory-verbal

comprehension and oral language production and if this intervention should not be the instructional nucleus with traditional silent reading, visual tasks being the supportive system. In addition, they suggested that additional research was needed to determine whether language processing and production deficits are so stabilized in the adolescent that remediation is nonproductive.

Frauenheim (1978) conducted a follow-up study of 40 adult males who were diagnosed as being severely language disabled in childhood. The original diagnosis had been determined through a multidiscipline evaluation process including professionals in education, psychology and psychiatry. The mean age at the time of the original diagnosis was 11 years, 6 months with an age range from 8 to 15 years. The post evaluation determined the mean adult age to be 21 years, 10 months with an age range from 18 to 31 years. Performance IQ scores for all subjects fell within the average to superior range. The full-scale IQ ranged from dull normal to bright normal. At the .001 level of significance there was a mean 19 point discrepancy between verbal and performance IQ scores.

The follow-up evaluation revealed that the subjects continued to experience the same severe difficulties in areas of reading, spelling and arithmetic that they had as children. In the original diagnosis, the subjects had a mean grade-level score in reading of 2.3 and in spelling, 1.6. Basing the adult reading score on an average of oral, vocabulary and comprehension the mean reading score for the adult subjects was 3.6. The averaged reading scores ranged from 1.5 to a high of 8.4. The mean grade level score on the spelling test was 2.9. In adulthood, spelling was the most seriously impaired

area of academic functioning with 80 percent of the subjects scoring lowest in this area.

Aaron (1978) and Farr (1977) discussed the concern in the United States today over the reading achievement of children, adolescents and adults. Farr found that from 1970 to 1976 students in the lower grades were reading better than their 1970 counterparts. At the upper grades, students in 1976 were not reading any better and perhaps not as well as students in 1970.

Campbell (1978) discussed the active involvement of federal, state and local government agencies in setting standards and measuring achievement in reading and other subjects of young Americans. The National Assessment of Educational Progress, financed through congressional appropriations, is designed to monitor the progress of students in the public schools by achievement testing of students ages nine, thirteen and seventeen every five years utilizing 100,000 subjects selected from all geographical areas of the United States. This agency has representation from lay people as well as many professions. A report recently submitted to the National Institute of Education, suggested research in the areas of reading development that could provide illumination which might improve the teaching and the learning of reading.

Jones (1977) wrote that 22 out of every 100 students entering the fifth grade today fail to complete high school even though they are intellectually competent to do so. Grill (1977) discussed the problems involved in identifying the severely learning disabled adolescent whose instructional rights are covered in Public Law 94-142. He found that most programs do not distinguish between the "hard core"

learning disabled and the mild to moderately disabled. According to Grill, schools must now provide services for a group of students for which there is limited information concerning their learning characteristics.

Research studies concerning the secondary student who is severely reading and spelling disabled were found to be limited in number. The early investigations conducted across medical, psychological and educational disciplines were often slanted toward identifying causation of an organismic nature. The studies were more often theoretically based with few practical implications for the classroom teacher. There is a dearth of information that provides avenues of communication between the research and the practitioner.

Seven decades of reading research has produced few absolutes that explain the organismic or academic causes of reading and spelling failure among students intellectually able to succeed. The severely language disabled student remains an educational, psychological and medical enigma.

CHAPTER III

METHODS AND PROCEDURES

The primary purpose of the present investigation was to identify and describe the language processing characteristics of selected secondary students whose reading and spelling performances were three or more years below their reading performance expectancy. This chapter contains a description of the subjects, the assessment instruments used, the assessment procedures and the treatment of the data.

This investigation was conducted to:

- (1) Determine the verbal, performance and full scale IQ's for each subject.
- (2) Determine the percentage of subjects with fifteen or more points discrepancy between the verbal and performance scale scores and the percentage with less than fifteen points discrepancy between the verbal and performance scale.
- (3) Determine each subject's estimated reading expectancy grade level and the group mean.
- (4) Determine each subject's silent reading grade score on a vocabulary test where words are presented in isolation and the group mean.
- (5) Determine each subject's silent reading grade score on a comprehension test that allows context clue utilization and the group mean.
- (6) Determine each subject's oral reading grade score and the group mean.
- (7) Determine each subject's oral reading error analysis pattern and the group mean for each error pattern.

- (8) Determine each subject's word recognition vocabulary reading grade score and the group mean.
- (9) Determine each subject's spelling percentage efficiency.
- (10) Determine each subject's error spelling analysis classification.
- (11) Determine the discrepancy between each subject's present grade placement and obtained reading achievement grade scores in this investigation.

Selection of Subjects

The subjects for this study were selected from Central State University Reading Clinic, Edmond, Oklahoma, and from the Oklahoma Child Service Demonstration Center, Cushing, Oklahoma. Twenty-six subjects met the selection criteria listed below:

- (1) All subjects had a minimum chronological age of thirteen years.
- (2) All subjects were identified by one of the special centers as being intellectually average (minimum IQ 90) or above average as determined by an individual intelligence test.
- (3) All subjects were informally observed by teachers or clinicians to be free from gross mental, physical or emotional handicaps that would contribute to the learning difficulty.
- (4) All subjects use English as their primary language.
- (5) All subjects had previously been administered a battery of tests by Central State University Reading Clinic or Oklahoma Child Service Demonstration Center that identified them as being three or more years retarded in reading and/or spelling achievement.

Central State University Reading Clinic is a part of Central State University's teacher training program and a service offered to the community. The Reading Clinic is operated each semester with

diagnostic evaluations being completed by the regular faculty of the Reading Department. Students are referred to the Clinic by parents, school personnel or acquaintances. Admission to the Reading Clinic tutorial program is based on need and availability of space. The main objective of the diagnostic/tutorial program is to develop an instructional plan for use in the Reading Clinic and the regular classroom. Students enrolled in the Reading Clinic are drawn from greater Oklahoma City and surrounding communities.

The Oklahoma Child Service Demonstration Center located in Cushing, Oklahoma, is a federally funded, cooperative diagnostic/prescriptive public school program involving six small, rural Oklahoma towns in north central Oklahoma; namely, Perkins, Stroud, Drumright, Cushing, Ripley, and Yale.

Permission for reviewing student files from Central State University Reading Clinic and the Oklahoma Child Service Demonstration Center was secured for initial selection of cases from files that were considered appropriate for this investigation. Further permission was obtained from the parents/guardians of students selected for this study.

Testing Procedure

The following test and evaluation procedures were administered individually by the investigator during the month of April, 1979:

- (1) The Wechsler Intelligence Scale for Children - Revised, Wechsler (1974 revision) or the Wechsler Adult Intelligence Scale (Wechsler, 1955).
- (2) Slosson Oral Reading Test (Slosson, 1963).

- (3) Gates-MacGinitie Reading Tests, Vocabulary subtest (Gates and MacGinitie, 1965).
- (4) The Nelson Reading Test, Paragraph Comprehension, Grade 3-9 (Nelson, 1962).
- (5) Gray Oral Reading Test (Gray, 1967).

The appropriate Wechsler Intelligence Scale was administered to subjects who had not had this evaluation within the past year. The investigator gave the WISC-R/WAIS to twenty-three subjects. A recent Wechsler evaluation was available for three of the subjects.

The Slosson Oral Reading Test was administered and evaluated for word identification grade score and for spelling performance efficiency using Boder's (1968) percentage categorization. Reading-spelling errors were analyzed and categorized according to Boder's three group classification.

The Gates-MacGinitie Reading Tests, Vocabulary subtest, was administered in order to determine the subject's ability to read words in isolation and to select appropriate synonyms. The level of the Gates-MacGinitie Tests was selected on the basis of each subject's reading grade score on the Slosson Oral Reading Test in order to provide a test which would produce the most reliable score. According to the Gates-MacGinitie Reading Test (1972):

Scores that are near the lowest or the highest raw scores obtainable with the test are less reliable than those between the extremes. Students getting only a few right answers may not have understood what they were to do. They should be retested with an easier test (p. 7).

The Nelson Reading Test, Paragraph Comprehension subtest, was administered in order to evaluate the subject's ability to attend

during sustained silent reading and to utilize words in context.

The Gray Oral Reading Test was used to determine an oral reading grade score and to record and categorize oral reading errors. Gray's error analysis guide (Manual) was used to identify the error categories.

Instruments Used

Wechsler Intelligence Scale for Children-Revised (WISC-R) was used in this investigation to obtain a Verbal, Performance and Full Scale Intelligence score. The WISC-R (Manual, 1974) norms were derived from groups representative of the United States' population of children ranging in age 5 years, 0 months through 16 years, 11 months. The standardizing sample included 200 children in each of eleven age groups with the total sample containing 2200 cases. There were 100 boys and 100 girls at each age level. Whites and nonwhites were included in the samples in the same proportion found in the 1970 census.

The WISC-R consists of twelve subtests that allow for Verbal and Performance Scale IQ scores as well as a Full Scale score. The Verbal Scale subtests include Information, Similarities, Comprehension, Arithmetic, Vocabulary and Digit Span. Digit Span is an optional subtest that was included in this investigation because it contributed to information about a subject's immediate auditory recall or immediate auditory memory (attention) span (Glasser and Zimmerman, 1967). The Performance Scale subtests include Picture Completion, Picture Arrangement, Block Design, Object Assembly and Coding. The Mazes subtest is optional and was not included in this investigation.

Reliability coefficients were obtained for the WISC-R using the

split-half technique with appropriate correction for the full length of the test using the Spearman-Brown formula. The Verbal, Performance, and Full Scale IQ's were found to have high reliability across all age ranges with the average coefficient being .94, .90 and .96 respectively.

Wechsler (1974) suggested that a difference of fifteen points or more between the Verbal Scale IQ and the Performance Scale IQ was significant and revealed the need for a more extensive investigation into the relationship between intellectual profile and learning characteristics.

The Wechsler Adult Intelligence Scale (WAIS) was administered to students whose ages were above those included in the WISC-R. In order to standardize the WAIS, a stratified sampling plan was used based on groups considered representative of United States adults with quotas being determined from an analysis of 1950 United States Census. Norms were developed for each of seven age groups ranging from 16 to 64 years. An equal number of men and women were included in each age group. These also included white and nonwhite subjects in the ratios found in the United States 1950 census.

The reliability coefficients were obtained for the Verbal, Performance and Full Scale IQ's. These were .96, .93 and .94 respectively for ages 18 and 19. The coefficients of correlation between IQ's based on WAIS and Stanford-Binet were .86, .69 and .85.

The Wechsler Adult Intelligence Scale is composed of six Verbal subtests. There are, Information, Comprehension, Arithmetic, Similarities, Digit Span and Vocabulary. There are five Performance Scale subtests. These are Digit Symbol, Picture Completion, Block Design, Picture Arrangement and Object Assemble. The WAIS produces a Verbal

IQ, Performance IQ and Full Scale IQ.

A formula suggested by Harris (1975, p. 212) giving mental age twice the weight of chronological age was used in order to calculate the subject's estimated reading expectancy grade level. The formula used was:

$$\frac{2MA + CA}{3} = \text{Reading Expectancy Age}$$

$$\text{REA} - 5.2 = \text{Reading Expectancy Grade Equivalent}$$

The Vocabulary subtest of the Gates-MacGinitie Reading Tests, was used in order to determine the subject's ability to recognize words in isolation and to select from a group of five words the word that was closest in meaning to the test word.

The Gates-MacGinitie Reading Tests, a series developed in 1965 (Manual), consists of three parts: Speed and Accuracy, Vocabulary and Comprehension. The Vocabulary subtest samples the students reading vocabulary. This subtest contains fifty items with the words progressing in difficulty from the first to the last word. The tests are designed to measure group and individual reading achievement from kindergarten through grade twelve.

The mean for each of the levels of the Gates-MacGinitie Reading Tests was set at fifty and the standard deviation at ten. The norms were developed by administering the tests to a nationwide sample of approximately 40,000 students. The norms for mid-October, mid-February, and mid-May represent the normative sample at three times during the school year. Alternative-form reliability coefficients were obtained by administering one form of the test on one day and a second form on another day. Split-half reliability coefficients were

also computed with correction being made for test length. For Survey D and Survey E the following reliability coefficients were reported:

Vocabulary - .86 (Survey D) and .80 (Survey E)

Comprehension - .87 (Survey D) and .81 (Survey E)

The Nelson Reading Test, Grades 3-9, Paragraph Comprehension sub-test, was administered in order to determine the student's ability to attend to a silent reading test that incorporates contextual reading of material that becomes increasingly more difficult from the first to last paragraph. The Nelson Reading Test, Revised Edition, 1962 (Manual), was standardized using a multiple cluster sampling with the United States being divided into four regions. Three community sizes were used within the regions. Each community was asked to test a specified number of students in grades three through nine. Classrooms were selected at random.

The alternate form method was used to derive a reliability coefficient. The paragraph comprehension reliability by grades was:

Grade	Reliability Coefficient
3	.88
4	.81
5	.86
6	.85
7	.83
8	.88
9	.87

Congruent validity was determined by administering the Nelson Reading Test with the Iowa Test of Basic Skills to 77 fourth grade students, 99 sixth grade students and 83 eighth grade students. Pear-

son product-moment correlations were computed:

Grade	Congruent Validity
4	.62
6	.76
8	.69

The Nelson Reading Test and the Nelson-Denny Reading Test were administered to 247 ninth grade students for further evidence of congruent validity which resulted in a validity coefficient of .76.

The Gray Oral Reading Test was administered in order to obtain an oral reading grade score. Oral reading errors were also noted and categorized.

Gray Oral Reading Test by William S. Gray (1967) was designed to measure growth in oral reading for first grade through college and to aid in the diagnosis of oral reading difficulties. Gray suggested that oral reading evaluation is an adjunct to silent reading tests. The Gray Oral Reading Test contains thirteen passages, each one more difficult than the one before. The comprehension questions require only literal understanding.

In constructing the tests, eleven series of basal readers being used in 1954 were selected for vocabulary perusal. The words common to the majority of the books were used as a guide for writing grades one through five passages. For grades six through eight, a preliminary list of words supplied by Dr. Edgar Dale was submitted to teachers and pupils for their judgment concerning the appropriateness of the words. In grades nine through twelve a preliminary list of 4800 words compiled from Thorndike and Lorge's Teacher's Word Book by Diederich and Palmer was used as a guide to writing the passages. The Spache

formula was used for determining the readability levels for the first five passages and the Dale-Chall formula was used for all others. Passages found to be equivalent were examined for content by two judges. Later the forms were examined by a second panel of specialists. The five preliminary forms of the Gray Oral Reading Test were submitted, in mimeographed form, to a number of reading specialists in various parts of the United States. Each person administered all five forms to each of five subjects. At a later time, three research assistants administered the four forms of the revised tests in elementary and secondary schools. In addition, selected college students and adults were tested.

The coefficients of intercorrelation among grade scores on each of the four forms at each grade level were calculated. The range for all students was from .973 to .982. In general, errors of less than 4.00 may be expected in the total passage score for any pupil 68 percent of the time.

The Slosson Oral Reading Test was used to obtain a reading grade score. This test is an individually administered instrument that measures the subject's ability to pronounce words at increasing levels of difficulty. The words, taken from standardized school readers and the reading level obtained from testing, represent median or standard school achievement. A correlation of .96 was obtained between the Slosson Oral Reading Test and the Standardized Oral Reading Paragraphs of William S. Gray. A reliability coefficient of .99 was obtained when the test was readministered after an interval of one week.

The words identified on the SORT were also used as a written spelling test and the percentage of correctly spelled sight words was

determined using Boder's classification. According to Boder, normal readers can usually spell seventy to one hundred percent of their sight vocabulary at present grade level. They can also sound out and read unknown phonetic words, and can write good phonetic equivalents to unknown words. Significantly disabled readers, classified as being dyslexic by Boder, are usually unable to spell fifty percent of their sight vocabulary at reading grade level.

Incorrectly spelled words from the written spelling test were classified according to Boder's spelling production patterns. These were:

- (1) Dysphonetic - reading-spelling production reflects primary difficulties in symbol-sound integration resulting in inefficient phonetic word analysis-synthesis skills.
- (2) Dyseidetic - reading-spelling production reflects primary difficulty in the ability to perceive whole words as visual gestalts.
- (3) Mixed Dysphonetic-Dyseidetics - reading-spelling production reflects primary difficulties in the ability to develop phonetic word analysis-synthesis skills and in the ability to perceive whole words as visual gestalts.

Treatment of Data

All subjects in this investigation were administered the Wechsler Intelligence Scale for Children-Revised or the Wechsler Adult Intelligence Scale. Each subject's Verbal Scale score and Performance Scale score were compared for proximity or difference between the two scores. In addition, the mean Verbal Scale, the mean Performance Scale IQ and the mean Full Scale IQ for the group were calculated.

The estimated reading expectancy grade level was determined for

each subject using a formula suggested by Harris (1975).

Grade scores were obtained from the Slosson Oral Reading Test; the Gates-MacGinitie Reading Tests, Vocabulary subtest; the Nelson Reading Test, Paragraph Comprehension subtest; and The Gray Oral Reading Tests. Each subject's grade scores on the four reading achievement tests were compared with present grade placement.

The oral reading errors made by each subject on the Gray Oral Reading Test were counted and categorized using Gray's error notations. Total oral reading errors were calculated for each subject and for the group. Group means were calculated for each error category.

The word pronounced correctly on the Slosson Oral Reading Test were given to each subject as a written spelling test. The percentage of words spelled correctly was computed for each subject. A sample of ten misspellings was obtained from each subject's spelling test for spelling production classification. These ten words were obtained from the subject's Slosson Oral Reading Test level where correct pronunciations were approximately fifty percent. The last word correctly pronounced, but incorrectly spelled, was counted as the first spelling error for analysis. The investigator then proceeded back through the subject's misspellings until ten words were selected. Each misspelled word was analyzed and classified as being dyseidetic, dysphonetic or mixed dyseidetic-dysphonetic. This modification of Boder's procedure was done in order to make it more applicable for classroom diagnosis and instruction.

CHAPTER IV

PRESENTATION AND TREATMENT OF DATA

This chapter presents a description, compilation of data collected and interpretation of data from twenty-six reading and spelling disabled subjects ranging from thirteen to nineteen years of age with a mean chronological age of 15.0 and a mean grade placement of 9.6 (Table I). All subjects had previously been identified by the Central State University Reading Clinic staff, Edmond, Oklahoma, or by a member of the diagnostic/prescriptive intervention team, Oklahoma Child Service Demonstration Center, Cushing, Oklahoma, as being intellectually average or above average but achieving significantly below estimated potential in reading and spelling. All subjects were selected on the basis of severity of reading and spelling deficits when compared to their apparent intellectual competence. The twenty-six subjects, ten female and sixteen male, fit the criteria selected for this investigation and were also available and willing to participate.

School and/or parental consent was obtained before the subject was included. Two subjects were of legal age. All subjects were aware of the investigator's purpose and the significance of their participation.

The evaluation battery required approximately three hours to complete. The testing was completed during the month of April, 1979.

TABLE I
DESCRIPTION OF SUBJECTS

Subjects	Sex	CA	Grade Placement
TK	F	13-3	7.7
CG	M	13-5	7.7
RP	M	13-5	7.7
KM	M	13-7	8.7
SA	M	13-8	8.7
JG	M	13-9	8.7
MD	F	13-10	8.7
TC	M	14-1	8.7
DK	F	14-3	8.7
JC	F	14-4	9.7
MR	M	14-6	8.7
DD	M	14-8	8.7
TW	F	14-10	8.7
LL	M	14-10	8.7
JB	F	14-11	9.7
LS	M	15-0	9.7
TT	F	15-5	10.7
PT	M	15-6	9.7
MM	M	15-7	10.7
CM	M	15-7	10.7
RM	M	15-11	10.7
KS	F	16-6	11.6*
JL	M	16-9	11.5*
TE	F	16-11	9.7
TB	F	18-2	12.7
MP	M	19-0	12.7
	Mean	15.0	9.6

*dropped out - 1979

Analysis of Data

The first determination in this investigation was to identify each subject's Verbal, Performance and Full Scale IQ on the Wechsler Intelligence Scale for Children-Revised or the Wechsler Adult Intelligence Scale. In addition, group mean scores were computed for the Verbal Scale IQ, the Performance Scale IQ and the Full Scale IQ (Table II).

Twenty-three subjects were administered the appropriate Wechsler Scale by the investigator. Three subjects already had an up-to-date Wechsler IQ obtained during the previous year.

The mean Full Scale IQ in this investigation was 104. There was an eleven point discrepancy between the mean Verbal Scale score of 99 and the mean Performance Scale score of 110. The Full Scale IQ range was from 94 to 120.

The second determination in this investigation was to identify the percentage of subjects with fifteen or more points discrepancy between the Verbal Scale IQ and the Performance Scale IQ and the percentage with less than fifteen points discrepancy between the Verbal and Performance Scales (Table II).

Ten subjects, or thirty-eight percent, had discrepancies of fifteen points or more between Wechsler Verbal Scale IQ's and Performance Scale IQ's. Nine of these subjects had Performance Scale IQ's fifteen or more points higher than Verbal Scale IQ's. The other subject had a Verbal Scale IQ fifteen or more points higher than Performance Scale.

Sixteen subjects, or sixty-two percent, had less than fifteen points discrepancy between Wechsler Verbal Scale IQ and Performance

TABLE II
WISC-R - WAIS INTELLIGENCE
SCALE DISTRIBUTION

Subject	CA	Performance IQ	Verbal IQ	Full Scale IQ
Performance Scale Greater than Verbal Scale 15+ Points:				
JC	14-4	141	79	108
JL	16-9	129	108	118
DK	14-3	124	95	109
JB	14-11	120	94	105
DD	14-8	114	98	105
TE	16-11	112	91	100
TW	14-10	111	84	96
KS	16-6	109	90	98
MD	13-10	105	86	94
Performance Scale Greater than Verbal Scale 1-14 Points:				
SA	13-8	115	101	108
PT	15-6	109	103	106
KM	13-7	109	96	105
LL	14-10	109	95	101
MP	19-0	107	104	106
TB	18-2	103	101	102
CM	15-7	102	100	101
RM	15-11	102	98	100
TT	15-5	102	92	96
LS	15-0	102	88	94
Verbal Scale Equal to Performance Scale:				
TC	14-1	105	105	105
MM	15-7	98	98	98
Verbal Scale Greater than Performance Scale 1-14 Points:				
TK	13-3	104	113	109
MR	14-6	101	113	108
CG	13-5	106	111	109
JG	13-9	104	108	106
Verbal Scale Greater than Performance Scale 15+ Points:				
RP	13-5	106	127	120
Mean		110	99	104
Range		98-141	79-127	94-120

Scale IQ.

The range of discrepancy between the Verbal Scale IQ and the Performance Scale IQ with the Verbal Scale IQ being higher was zero to twenty-one points. The range of discrepancy between the Performance Scale IQ and the Verbal Scale IQ with the Performance Scale IQ being higher was zero to sixty-two points.

The third determination in this investigation was to identify each subject's estimated reading expectancy grade score. A formula adapted by Harris (1975) was used to compute estimated reading expectancy age and grade scores for each subject. This formula gives two times the weight to mental age that it does to chronological age. The mean estimated reading expectancy grade level for this investigation was 10.2. The estimated reading expectancy grade score range was from 8.8 to 14.5 (Table III).

The fourth determination was to identify each subject's silent reading grade score on a vocabulary test where words were presented in isolation and the group mean. The Gates-MacGinitie Reading Test, Vocabulary subtest, was administered to each subject (Table IV). The survey selected was on the basis of the subject's reading grade score on the Slosson Oral Reading Test.

The group mean for the Gates-MacGinitie Reading Tests, Vocabulary subtest, was 5.5 with the range being from 2.2 to 8.0.

The fifth determination was to identify each subject's reading comprehension grade score on a comprehension test that allowed context clue utilization and the group mean. The Nelson Reading Test, Grades 3-9, Paragraph Comprehension subtest, was administered to all subjects. According to the scores on the Slosson Oral Reading Test,

TABLE III
 SUBJECT'S ESTIMATED READING
 EXPECTANCY GRADE LEVEL

Subject	CA	MA	Estimated Reading Expectancy Grade Level
MD	13-10	13-0	8.1
TK	13-3	14-4	8.8
KM	13-7	14-3	8.8
CG	13-5	14-6	8.9
SA	13-8	14-8	9.1
JG	13-9	14-6	9.1
TW	14-10	14-2	9.2
LS	15-0	14-1	9.2
TC	14-1	14-8	9.3
LL	14-10	15-0	9.7
TT	15-5	14-8	9.7
DK	14-3	15-5	9.8
JC	14-4	15-5	9.9
DD	14-8	15-4	9.9
RP	13-5	16-1	10.0
MR	14-6	15-7	10.0
JB	14-11	15-7	10.2
MM	15-7	15-3	10.2
CM	15-7	15-7	10.4
RM	15-11	15-9	10.6
PT	15-6	16-4	10.9
KS	16-6	16-2	11.1
TE	16-11	16-9	11.6
TB	18-2	18-5	13.1
JL	16-9	19-8	13.5
MP	19-0	20-1	14.5
		Mean	10.2

TABLE IV
SILENT READING ACHIEVEMENT, GATES-MACGINITIE
READING TESTS (VOCABULARY SUBTEST)

Subjects	Survey	Grade Score
LL	C	2.2
DD	C	2.7
MD	C	2.9
KM	E	3.3
TW	C	4.0
LS	D	4.0
DK	E	4.0
RM	D	4.2
TK	C	4.4
MM	D	4.5
TE	D	5.2
CM	E	5.6
CG	D	6.0
JB	D	6.0
JL	E	6.2
KS	E	6.6
PT	D	6.5
SA	D	6.9
JC	D	6.8
MR	E	6.9
RP	E	6.9
TB	E	6.9
TT	E	7.3
JG	E	8.0
TC	E	8.0
MP	E	8.0
	Mean	5.5

The Nelson Reading Test was an appropriate selection. The test format allowed the subjects to begin reading at a low level with each of the seventy-five selections becoming more difficult. The raw score number completed ranged from eleven to thirty-nine. The mean grade score was 5.1 with a range of 2.3 to 9.9 (Table V).

The sixth determination was to identify each subject's oral reading grade score. The Gray Oral Reading Test was administered to each subject. According to the standardized directions, the investigator was to begin the oral reading selection two grade levels below the subject's grade placement. In this investigation, each subject was started at a level comparable to his SORT reading grade scores. According to the manual the selection on which there were no errors was considered the base. The upper limits were established when the subject made seven or more errors on two successive passages. Six of the subjects did not read any of the paragraphs without errors, even though all six read paragraphs downward until the pre-primer selection was completed. The twelve passages ranged from pre-primer to college level. Each passage read by the subject was timed and errors, if any, were recorded according to Gray's error notations. There were eight error categories. An oral reading grade score was obtained by using the total number of errors and the time it took to read each selection. Therefore, rate and number of errors were the variables used by Gray in computing an oral reading grade score table. Literal comprehension of the material read was checked by asking four questions at the end of each selection. The number answered correctly was recorded but was not a factor in the computation of the subject's oral reading grade score. The mean oral reading

TABLE V
SILENT READING ACHIEVEMENT, THE NELSON
READING TEST (PARAGRAPH COMPREHENSION)

Subjects	Grade Score
LS	2.3
MD	2.6
DD	2.8
TW	3.0
LL	3.0
TK	3.1
KM	3.9
MM	4.1
SA	4.3
TC	4.5
CG	4.6
DK	4.9
RM	5.1
JB	5.2
JL	5.4
CM	5.4
MR	5.5
TE	5.7
RP	6.0
JC	6.0
KS	6.2
PT	6.2
JG	6.9
TT	7.9
MP	8.3
TB	9.9
Mean	5.1

grade score was 3.8. The range between the highest and lowest grade score was 1.6 to 10.6 (Table VI).

The seventh determination was to identify each subject's oral reading error analysis profile. Of the eight categories, substitutions and repetitions accounted for the largest number of errors. Repetitions accounted for twenty-six percent; substitutions, nineteen percent; aid, fifteen percent; gross mispronunciation, fourteen percent; partial mispronunciations, eight percent; insertions, eight percent; omissions, seven percent and inversions, three percent (Table VII).

The eighth determination was to identify each subject's sight recognition vocabulary grade score. The Slosson Oral Reading Test was administered and a sight recognition reading grade score was obtained. This test consisted of two hundred words divided into ten categories of twenty words each. The difficulty range was from primer reading level to high school reading level. The standardized directions were followed and only those words identified within the five second time limit were counted as being correct.

The mean sight recognition vocabulary score for the subjects was 6.2 with the range being from 2.8 to 9.0. Six of the subjects had scores of fourth grade or below (Table VIII).

The ninth determination was to identify each subject's spelling efficiency percentage. The words each subject correctly pronounced on the Slosson Oral Reading Test were later dictated as written spelling test. The words were checked for accuracy of spelling and the number correct was tabulated into percentage of sight recognition vocabulary spelled correctly (Table IX).

TABLE VI
ORAL READING ACHIEVEMENT
THE GRAY ORAL READING
TEST

Subjects	Grade Score
LL	1.6
MD	1.7
LS	1.8
RM	1.8
CM	1.9
DD	1.9
CG	1.9
TW	2.0
TK	2.1
KM	2.1
JC	2.1
MM	2.3
SA	2.5
DK	2.7
KS	3.5
JB	3.7
JL	4.2
TT	4.6
TE	5.0
JG	5.4
TC	5.6
TB	6.2
MP	6.4
PT	7.0
MR	9.0
RP	10.6
Mean	3.8

TABLE VII
GRAY ORAL READING ERROR
ANALYSIS PROFILE

Subject	Aid	Gross Mispron.	Partial Mispron.	Omission	Insertion	Substitution	Repetitions	Inversion	Total
TK	10	3	0	0	2	6	2	0	23
CG	5	2	0	3	10	4	3	4	31
RP	0	5	5	0	1	2	4	0	17
KM	2	1	0	4	5	10	8	0	30
SA	3	1	0	4	4	8	6	0	26
JG	1	6	8	0	0	0	24	0	39
MD	11	5	0	6	1	5	2	2	32
TC	9	2	3	1	3	3	5	0	26
DK	10	3	1	0	1	6	5	0	26
JC	6	1	0	0	0	6	2	3	18
MR	3	3	4	3	2	0	8	0	23
DD	6	10	0	3	1	13	7	1	41
TW	8	5	0	3	0	8	3	0	27
LL	6	14	2	0	0	3	4	1	30
JB	6	5	2	2	0	0	8	1	24
LS	3	4	1	1	2	4	17	0	32
TT	7	1	3	1	1	5	4	0	22
PT	0	1	2	2	0	0	10	0	15
MM	1	1	1	5	7	8	8	3	34
CM	2	7	2	0	3	10	7	2	33
RM	1	1	1	0	0	12	3	1	19
KS	1	4	4	2	2	2	12	0	27
JL	0	2	1	4	4	5	13	0	29
TE	0	5	4	0	2	3	4	0	18
TB	1	5	3	0	0	3	2	0	14
MP	0	3	5	2	7	2	10	0	29
Total	102	100	52	46	58	128	181	18	685
Mean	3.92	3.85	2.00	1.77	2.23	4.92	6.96	.69	26.35

TABLE VIII
SIGHT RECOGNITION VOCABULARY
SLOSSON ORAL READING TEST

Subjects	Grade Score
LL	2.8
DD	3.2
TK	3.2
TW	3.6
MD	3.8
RM	4.0
JC	5.4
LS	5.5
MM	5.9
PT	6.0
CG	6.1
JB	6.2
SA	6.4
TE	6.5
KS	7.0
DK	7.1
CM	7.1
TT	7.3
KM	7.3
JL	7.7
JG	7.9
MP	7.9
MR	8.0
TB	8.4
RP	8.6
TC	9.0
Mean	6.2

TABLE IX
SIGHT VOCABULARY - SPELLING

Subject	Slosson Oral Reading Test Raw Score	Percentage of SORT (Raw Score) Spelled Correctly
LS	111	41
DK	142	42
JG	159	44
DD	64	44
MM	119	44
LL	56	45
PT	120	47
RP	173	50
SA	129	50
CM	142	54
JL	155	55
MP	158	55
CG	123	59
JB	124	60
KM	146	60
MD	76	61
TT	146	62
JC	108	63
RM	81	70
KS	141	72
TK	64	72
TW	73	75
TB	168	76
TE	131	80
MR	151	84
TC	181	90
	Mean	60

Only two students in this investigation were able to score at grade level on the Slosson Oral Reading Test. The remaining twenty-four subjects had sight recognition vocabulary reading grade scores below their actual grade placement. Ten of the subjects, or thirty-eight percent, spelled correctly less than fifty percent of their sight recognition vocabulary.

The tenth determination was to identify each subject's misspelling classification. In order to analyze and categorize spelling errors, a sample of ten misspelled words from each subject's written spelling test was selected (See Appendix). Each misspelled word was classified as dysphonetic or dyseidetic.

Misspellings classified as dysphonetic were those the subject attempted to spell by sight alone and not by sound-symbol integration. Misspellings classified as dyseidetic were those containing a fairly accurate, though incorrect, sound-symbol representation.

Two reading authorities were asked to help classify misspellings. A simplified procedure was devised where each misspelled word was verbalized. If the subject's spelling were a fairly accurate representation of the dictated word such as "cuntemperary" for "contemporary," the misspelling was classified as dyseidetic. If the subject's spelling had vowel substitution such as "hell" for "hill," silent letter omissions, incorrect sequencing or bizarre combinations such as "prftlebler" for "profitable," the misspelling was classified as dysphonetic.

A misspelling pattern was identified for each subject. In order to be included in one misspelling classification as opposed to the other, seven or more of the ten words analyzed had to fit the pattern criteria

for the designated group. When misspelling patterns were split 4/6 or 5/5 between dysphonetic and dyseidetic, these subjects were classified as mixed dysphonetic-dyseidetic (Table X). Nine subject's misspellings were classified as dysphonetic. Eight subject's misspellings were classified as dyseidetic and nine subject's misspellings were classified as mixed dysphonetic-dyseidetic.

The eleventh determination was to identify the discrepancy between each subject's present grade placement and reading achievement grade scores obtained in this investigation (Table XI). The discrepancy between the mean present grade placement and the mean silent reading vocabulary grade score (Gates-MacGinitie) was 4.1. The discrepancy between the mean present grade placement and the silent reading paragraph comprehension (Nelson) mean grade score was 4.5. The discrepancy between the mean present grade placement and the mean oral reading score (Gray) was 5.8. The discrepancy between present grade placement and the mean sight recognition vocabulary grade score (SORT) was 3.3.

Interpretation of Data

Individual Wechsler IQ's in this investigation did not produce differences that would predict reading and spelling disabilities. The full scale IQ of subject's in this study ranged from 94 to 120 revealing that poor achievement may not be due to lack of intelligence.

There was not a single Wechsler Verbal Scale IQ-Performance Scale IQ profile pattern that could be identified as predicting severe reading and/or spelling difficulties.

While thirteen of the subjects in this investigation had significant

TABLE X
 MISSPELLING PATTERNS

Subjects	Number (Words) Classified Dysphonetic	Classified Dyseidetic
Dysphonetic		
CG	7	3
KM	7	3
SA	8	2
MD	8	2
JC	9	1
LL	7	3
MM	8	2
CM	9	1
JL	7	3
Dyseidetic		
KS	1	9
TE	1	9
TC	1	9
DK	1	9
MR	1	9
JB	3	7
RP	0	10
TK	3	7
Mixed Dysphonetic-Dyseidetic		
DD	6	4
JG	5	4
TW	5	5
LS	6	4
TT	4	6
PT	5	5
RM	6	4
TB	5	5
MP	4	6

TABLE XI
DISCREPANCY BETWEEN PRESENT GRADE PLACEMENT
AND OBTAINED READING ACHIEVEMENT
GRADE LEVEL SCORES

Subject	Present Grade Placement	Silent Reading Vocabulary (Gates-MacGinitie)	Discrepancy	Silent Reading Comprehension (Nelson)	Discrepancy	Oral Reading (Gray Oral Reading Test)	Discrepancy	Word Recognition (Stosson Oral Reading Test)	Discrepancy
TK	7.7	4.4	3.3	3.1	4.6	2.1	5.6	3.2	4.5
CG	7.7	6.0	1.7	4.6	3.1	1.9	5.8	6.1	1.6
RP	7.7	6.9	0.8	6.0	1.7	10.6	+2.9	8.6	+0.9
KM	8.7	3.3	5.4	3.9	4.8	2.1	6.6	7.3	1.4
SA	8.7	5.8	1.9	4.3	4.4	2.5	6.2	6.4	2.3
JG	8.7	8.0	0.7	6.9	1.8	5.4	3.3	7.9	0.8
MD	8.7	2.9	5.8	2.6	6.1	1.7	7.0	3.8	4.9
TC	8.7	8.0	0.7	4.5	4.2	5.6	3.1	9.0	+0.3
DK	8.7	4.0	4.7	4.9	3.8	2.7	6.0	7.1	1.6
MR	8.7	6.9	1.8	5.5	3.2	9.0	+0.3	8.0	0.7
DD	8.7	2.7	6.0	2.8	5.9	1.9	6.8	3.2	5.5
TW	8.7	4.0	4.7	3.0	5.7	2.0	6.7	3.6	5.1
LL	8.7	2.2	6.5	3.0	5.7	1.6	7.1	2.8	5.9
JC	9.7	6.8	2.9	6.0	3.7	2.1	7.6	5.4	4.3
JB	9.7	6.0	3.7	5.2	4.5	3.7	6.0	6.2	3.5
LS	9.7	4.3	5.4	3.4	7.4	1.8	7.9	5.5	4.2
PT	9.7	6.5	3.2	6.2	3.5	7.0	2.7	6.0	3.7
TE	9.7	5.2	4.5	5.7	4.0	5.0	4.7	6.5	3.2
TT	10.7	7.3	3.4	7.9	2.8	4.6	6.1	7.3	3.4
MM	10.7	4.5	6.2	4.1	6.6	2.3	8.4	5.9	4.8
CM	10.7	5.6	5.1	5.4	5.3	1.9	8.8	7.1	3.6
RM	10.7	4.2	6.5	5.1	5.6	1.8	8.9	4.0	6.7
KS	11.5 D*	6.6	5.0	6.2	5.4	3.5	8.1	7.0	4.6
JL	11.6 D*	6.2	5.3	5.4	6.1	4.2	7.3	7.7	3.8
TB	12.7	6.9	5.8	9.9	2.8	6.2	6.5	8.4	4.3
MP	12.7	8.0	4.7	8.3	4.4	6.4	6.3	7.9	4.8
MEAN	9.6	5.5	4.1	5.1	4.5	3.8	5.8	6.2	3.3

*Grade placement when student dropped out of school

+Above present grade placement

differences between Wechsler Verbal and Performance IQ's which might suggest reading and spelling difficulties, these subjects were no more reading and spelling disabled than eleven subjects who had either no discrepancy or minor discrepancy between the two scales.

There was some tendency on the part of subjects with Performance Scale IQ's fifteen or more points higher than Verbal Scale IQ's to have more difficulty with reading than with spelling, a situation also found in the Nelson and Warrington (1974) study.

One subject whose primary difficulty was spelling had a Verbal IQ more than fifteen points higher than Performance IQ.

Projected reading expectancy grade levels revealed an expectancy range significantly different from the actual reading achievement range. Obviously, estimated reading expectancy grade scores appeared spurious, providing relevant meaning only when the expectancy scores were used to calculate the degree of disability.

The group mean on the paragraph comprehension test did not reveal the degree of context reading that is usually expected from subjects with the intellect to use this skill. Whether slow rate and low efficiency were due to inadequate word attack skills or whether severely language disabled secondary subjects are deficient in verbal syntactic structure which limits the ability to utilize redundancy and prediction was not revealed in this study.

Subjects in this investigation were able to answer the comprehension questions on the Gray Oral Reading Test with a high degree of accuracy. Even at the level of frustration, most subjects had little difficulty with comprehension. This result reinforces Vogel's (1975) findings that normal and dyslexic subjects find meaning conveyed

primarily through the syntactic structure rather than through individual words.

More substitution and repetition oral reading errors were made by subjects in this investigation than any other type of error. Gray's arrangement for determining an oral reading grade score used rate and number of errors as the two variables contributing to the oral reading grade score. Therefore, subjects who read slowly were probably penalized. Those who tended to make errors that could be considered errors with emotional overlay such as substitution and repetition were also penalized. Goodman (1970) and Smith (1971) do not give error priority to meaningful substitutions or to repetitions. Smith views repetitions as an overloading of the visual system. On the other hand, Vogel found dyslexics to be deficient in oral reading syntax which may account for the large percentage of repetition and substitution errors in this investigation.

The sight recognition vocabulary grade score (Slosson) mean was the highest achievement score in this investigation. Rate of response was, however, a limiting factor since all words counted as being correct had to be pronounced within the five seconds limit. Subjects in this investigation tended to process language at a slower than normal pace which corresponds to Samuel's (1974) description of the two levels of letter-sound processing which are accuracy and automaticity. Within this context, many of the subjects were at the pre-accuracy and accuracy level and not at the automatic level. It is possible that using an instrument that allowed for an automatic response and a mediation response would have made the score more meaningful.

Classification of spelling errors into dysphonetic, dyseidetic

and mixed dysphonetic-dyseidetic produced three almost equal groups.

Subjects classified as dysphonetic, tended to have reading achievement scores of fifth grade or below, a level suggested by Boder (1968) as being the ceiling for most dysphonetic subjects. However, the three subjects with higher reading achievement scores had intellectual profiles which may account for the higher than expected grade score.

Subjects classified as dyseidetic tended to score higher than subjects classified as dysphonetic. Dyseidetics have the advantage of being able to "sound out" unfamiliar words and to spell by sound.

The subjects in this investigation classified as mixed dysphonetic-dyseidetic did not have any other distinguishing characteristics different from dysphonetic or dyseidetic subjects. However, a more comprehensive remedial reading and spelling program would be needed since these students had strengths in neither sight memory nor spelling by sound.

All of the subjects in this investigation were initially identified as being intellectually average or above average and severely disabled in reading and/or spelling skills. The investigation has attempted to determine the language processing characteristics of individuals who were already identified as being severely language disabled to see if there were commonalities.

The global implications that may be drawn from this investigation cluster around one basic realization: Secondary students with severe reading and spelling deficits are more heterogeneous than homogenous in intellectual composition and in processing characteristics. While achievement grade scores appear to imply homogeneity of instructional

needs, analyzing individual language processing characteristics de-emphasizes likenesses and emphasizes differences which preclude narrowly binding remedial instruction.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary of the Study

The purpose of this study was to provide a description of language processing characteristics of selected secondary students who have not achieved academic success in the classroom because of limited reading and spelling skills.

Subjects used in this investigation were selected from Central State University Clinic, Edmond, Oklahoma and from the Oklahoma Child Service Demonstration Center, Cushing, Oklahoma. Twenty-six subjects were included in the study. Their chronological ages ranged from thirteen to nineteen years. All subjects met the following criteria: (1) to have a minimum chronological age of thirteen years, (2) to be intellectually average or above average as determined by an individualized intelligence test, (3) to have been informally observed by teachers or clinicians to be free from gross mental, physical or emotional handicaps, (4) to use English as their primary language, and (5) to have been previously identified by Central State University Reading Clinic or Oklahoma Child Service Demonstration Center as being three or more years retarded in reading and/or spelling achievement when compared to their estimated reading expectancy grade equivalent.

This investigation was conducted to:

- (1) Determine the verbal, performance and full scale IQ's for each subject as well as the mean for each of the scales.
- (2) Determine the percentage of subjects with the verbal and performance scale scores of the individualized intelligence test being fifteen or more points different and those with similar verbal and performance scale scores.
- (3) Determine each subject's estimated reading expectancy grade level and the group mean.
- (4) Determine each subject's silent reading grade score on a vocabulary test where words were presented in isolation and the group mean.
- (5) Determine each subject's silent reading grade score on a comprehension test that allowed context clue utilization and the group mean.
- (6) Determine each subject's oral reading grade score and the group mean.
- (7) Determine each subject's oral reading error analysis pattern and the group mean for each error pattern.
- (8) Determine each subject's word recognition vocabulary reading grade score and the group mean.
- (9) Determine each subject's spelling efficiency percentage.
- (10) Determine each subject's spelling error analysis classification.
- (11) Determine the discrepancy between each subject's present grade placement and obtained reading achievement grade scores in this investigation.

Summary of Findings

Intelligence

The Full Scale IQ range for this investigation was from 94 to 120. The mean Full Scale IQ was 104. Ten subjects, or thirty-nine percent, had fifteen or more points discrepancy between the Verbal Scale IQ and the Performance Scale IQ.

Nine subjects had Performance Scale IQ's fifteen or more points above their Verbal Scale IQ. One subject's Verbal Scale IQ was more than fifteen points above the Performance Scale IQ. The range of discrepancy between scales for this segment of the group was sixteen to sixty-two points.

Sixteen subjects, or sixty-one percent, had discrepancies between the Verbal Scale IQ and the Performance Scale IQ less than fifteen points. The range of discrepancy for this segment of the group was zero to fourteen points.

Estimated Reading Expectancy

The twenty-six subjects ranged from thirteen to nineteen years of age with a mean present grade placement of 9.6. Their mean estimated reading grade expectancy was 10.2 with the range being from 8.1 to 14.5.

Reading Achievement

The mean grade score obtained from the administration of the Vocabulary subtest of the Gates-MacGinitie Reading Tests was 5.5; the mean grade score of the Paragraph Comprehension subtest of The Nelson Reading Test was 5.1; the mean grade score on the Gray Oral Reading Test was 3.8 and the mean grade score on the Slosson Oral Reading Test was 6.2.

Analysis of Reading Errors

The mean number of errors for the eight error categories on the Gray Oral Reading Test were aid, 3.92; gross mispronunciation, 3.86; partial mispronunciation, 2.00; omissions, 1.77; insertions, 2.23;

substitutions, 4.92; repetitions, 6.96 and insertions, .69.

Sight Recognition Vocabulary-Spelling Percentage

Of the twenty subjects, nine were unable to spell more than fifty percent of their sight recognition vocabulary (Slosson). Another six subjects misspelled approximately forty percent of their sight recognition vocabulary.

Misspelling Classification

Nine subjects had misspelling characterized as dysphonetic; eight subjects had misspelling characterized as dyseidetic and nine subjects had misspellings characterized as mixed dysphonetic-dyseidetic.

Conclusions

The following conclusions resulted from this investigation:

- (1) Significant discrepancies between Wechsler Verbal Scale IQ's and Performance Scale IQ's were not characteristic of all the subjects even though all subjects were found to have severe reading and/or spelling problems.
- (2) Group Wechsler Verbal Scale IQ's and Performance Scale IQ's did not provide a pattern that could be used for identifying subjects with reading and spelling disabilities although individually there were tendencies that should be considered.
- (3) Individual language processing characteristics and reading achievement levels were found to vary considerably making it unrealistic to use group averages when describing language disabled students and planning remedial instruction.
- (4) Oral reading tests may not be as reliable for measuring the achievement of subjects with severe reading difficulties as silent reading tests. For these subjects, silent reading tests should be used in conjunction with oral reading tests.

- (5) Estimated reading expectancy grade scores are useful for students in becoming aware of their own reading potentials and for teachers who tend to underestimate the ability levels of disabled readers.
- (6) Misspelling analysis can provide information about appropriate remedial spelling instruction for severely reading and spelling disabled secondary students.
- (7) Percentage of sight recognition vocabulary spelled correctly did not provide a pattern that characterized the group's performance but percentages would be relevant for individualized instruction.

Implications for Education

The following implications are considered important in developing instructional programs and procedures:

- (1) Secondary students who are reading and spelling disabled are more heterogeneous than homogenous in their language processing characteristics, therefore, remedial instruction should be individualized.
- (2) Students with severe reading and spelling problems do not necessarily have significant discrepancies between their verbal scale IQ and their performance scale IQ. A more appropriate evaluation might be to identify each subject's subtest profile and relate strengths and weaknesses to reading and spelling tasks.
- (3) Individual Wechsler Intelligence Scale profiles may indicate a tendency toward a type of reading and/or spelling disability but they are unreliable for making an absolute diagnosis.
- (4) Standardized reading and spelling tests are not always appropriate for severely reading and spelling disabled students. Test administration and levels of difficulty may have to be modified in order to obtain reliable diagnostic information for planning an individualized instructional program.
- (5) Estimated reading expectancy grade level scores should be computed periodically for each student so that teachers will be aware of the individuals estimated potential.

- (6) Reading and spelling processing profiles as well as intellectual profiles should be developed for all secondary students identified as being reading and spelling disabled.
- (7) Misspelling analysis should be a part of the evaluation procedure for students experiencing reading and spelling problems as early as the first or second grade so that instruction can be adjusted to the processing characteristics of the individual.
- (8) Oral reading for secondary students with severe reading deficits should be kept at a minimum since they tend to show least reading achievement when reading orally.
- (9) Individuals who are identified as dysphonetic should have remedial instruction that begins initially by using the whole word technique with tactile and kinesthetic as well as mnemonic reinforcement. Since phonics will not be easy for the dysphonetic, special consideration should be given to processing large units such as phonograms, prefixes and suffixes.
- (10) Individual who are identified as dyseidetic should have remedial instruction utilizing tactile, kinesthetic and mnemonic clues. Structured redundancy is important allowing for the overlearning of "stubborn" words. Since these individuals tend to spell by ear, accurate sound unit clustering is necessary.
- (11) Individuals who are identified as mixed dysphonetic-dyseidetic should have remedial instruction that combines procedures for dysphonetics and dyseidetics with structure that informally measures objectives and progress so that attention can be properly directed.

Recommendations for Further Research

- (1) A replication of this study should be initiated using subjects from a different geographical area and/or ethnic group.
- (2) A sight-recognition vocabulary test should be developed which contains phonetic and non-phonetic words appropriate for producing a sight recognition grade score and for spelling error classification.

- (3) A study should be made of spelling disabled secondary students which uses misspelling categorization as the format for remedial spelling instruction to determine the usefulness of error analysis procedure.
- (4) A study should be initiated that investigates Boder's misspelling classification with students in the third, fourth and fifth grades to determine whether dysphonetic, dyseidetic and mixed dysphonetic-dyseidetic characteristics are as recognizable with this age group as they were in this investigation.
- (5) A study should be undertaken that involves developing and implementing alternative ways of teaching and evaluating students in content area subjects who are intellectually able but severely reading and spelling disabled.
- (6) A longitudinal study should be initiated that involves the language disabled secondary student in developing a reading, spelling and intellectual diagnostic evaluation that serves as a format for remedial instruction. This instruction should be planned and organized through pupil-teacher interaction with self-pacing and self evaluations being a major part of the program.

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APPENDIX

SUBJECT'S SPELLING ERROR SAMPLES

SUBJECT'S SPELLING ERROR SAMPLES

	WORDS DICTATED	SUBJECT'S SPELLING	DYSPHONETIC	DYSEIDETIC
TK	understood	understod		X
	perform	prfrom		X
	ocean	ocen		X
	stone	stune	X	
	evening	eveing		X
	reward	reord		X
	heavy	have		X
	forest	farst		X
	suddenly	sloundly	X	
	better	betard	X	
	TOTAL ERRORS		3	7
CG	abundant	abudute	X	
	detained	detaned		X
	consequently	coniscuinly	X	
	imaginary	amanager	X	
	yearning	yerning		X
	spectacular	spatarlar	X	
	customary	cutomary		X
	liquid	lugide	X	
	responsible	resonsible	X	
	infected	infeted	X	
	TOTAL ERRORS		7	3
RP	grotesque	grotesk		X
	nonchalant	nonshalont		X
	supplement	suplument		X
	intangible	intangibull		X
	whimsical	wimsicul		X
	twilight	twilite		X
	antique	antecque		X
	nucleus	nuclyes		X
	prairies	prarys		X
	continuously	continisly		X
	TOTAL ERRORS		0	10

	WORDS DICTATED	SUBJECT'S SPELLING	DYSPHONETIC	DYSEIDETIC
KM	compliments	complns	X	
	abundant	anunty	X	
	detained	detany	X	
	imaginary	imangey	X	
	yearning	yaring	X	
	customary	cusamary		X
	tremendous	tremandus		X
	responsible	raspanable	X	
	infected	imficted		X
	medicine	madasam	X	
	TOTAL ERRORS		7	3
CG	continuously	conushly	X	
	complexion	complaexan		X
	compassionate	compashaat	X	
	exhausted	exhalged	X	
	standardize	standise	X	
	pensive	pensaie	X	
	architecture	aurgther	X	
	society	alsiatea	X	
	approximate	apallement	X	
	industrious	industerise		X
	TOTAL ERRORS		8	2
JG	exuberant	exsuclerant	X	
	inducement	indusnent	X	
	formulated	formalated		X
	memorandum	muradein	X	
	antique	antexa	X	
	evident	evedent		X
	complexion	compleaction		X
	attentively	atently	X	
	exhausted	exastead		X
	TOTAL ERRORS		5	4

	WORDS DICTATED	SUBJECT'S SPELLING	DYSPHONETIC	DYSEIDETIC
MD	river	rever		X
	farmer	famre	X	
	happen	hapen		X
	better	brate	X	
	field	feide	X	
	breakfast	brafhust	X	
	hide	hade	X	
	along	longe	X	
	hill	hall	X	
	food	fwdee	X	
		TOTAL ERRORS	8	2
TC	nonchalant	nonshalent		X
	inducement	indicement		X
	supplement	suplument		X
	irrelevance	erelivence		X
	remarkably	remarkabley		X
	intangible	intangable		X
	memorandum	mimarandum		X
	nucleus	nucles		X
	evident	evedent		X
	prairies	pra	X	
			TOTAL ERRORS	1
DK	continuously	cuntenusly		X
	complexion	complicshen		X
	attentively	utivly	X	
	contemporary	cuntemperary		X
	standardized	standerised		X
	pensive	penseve		X
	architecture	arctecture		X
	society	sicite		X
	industrious	indusherust		X
	environment	invirnment		X
			TOTAL ERRORS	1

	WORDS DICTATED	SUBJECT'S SPELLING	DYSPHONETIC	DYSEIDETIC
JC	dainty	d	X	
	common	com	X	
	region	re	X	
	speechless	pleechless	X	
	appearance	apre	X	
	anger	angre	X	
	distant	dis	X	
	forehead	forhead		X
	courage	cougre	X	
	develop	de	X	
		TOTAL ERRORS	9	1
MR	exuberant	exuperent		X
	supplement	suplument		X
	intangible	intangable		X
	prairies	prarises		X
	attentively	atentively		X
	pensive	penseve		X
	society	soceity	X	
	crisis	crisice		X
	counterfeit	counterfit		X
	environment	enviorment		X
		TOTAL ERRORS	1	9
DD	understood	unseud	X	
	excuse	exques		X
	perform	prform		X
	damp	domp	X	
	ocean	ousen		X
	grove	gove	X	
	stone	song	X	
	stream	drem	X	
	evening	eveing		X
	reward	rewed	X	
		TOTAL ERRORS		

	WORDS DICTATED	SUBJECT'S SPELLING	DYSPHONETIC	DYSEIDETIC
TW	bench	beench		X
	grove	grow	X	
	against	agenst		X
	safe	save	X	
	station	staschen		X
	heavy	havey		X
	stars	stares	X	
	suddenly	suddly	X	
	large	larg	X	
	breakfast	brakfist		X
		TOTAL ERRORS		5
LL	forest	forst		X
	farmer	fromer	X	
	large	larg	X	
	breakfast	brakfast		X
	across	areas	X	
	grass	gress	X	
	first	frist	X	
	puppy	pupy		X
	hill	hell	X	
	down	bown	X	
		TOTAL ERRORS		7
JB	compliments	compulments		X
	abundant	aboundedent		X
	detained	detianed		X
	dungeon	dugen	X	
	excellence	exlence		X
	imaginary	emaguary		X
	yearning	urning		X
	spectacular	septlar	X	
	customary	costemary		X
	responsible	resposale	X	
		TOTAL ERRORS		3

	WORDS DICTATED	SUBJECT'S SPELLING	DYSPHONETIC	DYSEIDETIC
LS	merchant	marugent	X	
	define	dfine		X
	marriage	merg	X	
	interfere	intrfer	X	
	terrace	teress		X
	extended	exted	X	
	generally	junrly		X
	dainty	danty		X
	future	further	X	
	speechless	spcless	X	
		TOTAL ERRORS		6
TT	continuously	co	X	
	compassionate	compastionat		X
	attentively	atentively		X
	exhausted	exz	X	
	industrious	industerise	X	
	crisis	crises		X
	counterfeit	counterfit		X
	environment	invirement		X
	administer	iminterer	X	
	detained	detaned		X
		TOTAL ERRORS		4
PT	detained	detane	X	
	yearning	yearmeing	X	
	spectacular	sptacler		X
	customary	custmary		X
	rebellion	rebolyon		X
	medicine	medesson		X
	installed	instted	X	
	merchant	merchent	X	
	profitable	prftlebler	X	
	responsible	responble		X
		TOTAL ERRORS		

	WORDS DICTATED	SUBJECT'S SPELLING	DYSPHONETIC	DYSEIDETIC
MM	imaginary	emacler	X	
	spectacular	ekonton	X	
	liquid	luique	X	
	responsible	responnd	X	
	infected	enficle	X	
	rebellion	reflecnd	X	
	medicine	meslen	X	
	importance	omportens		X
	installed	instule	X	
	merchant	murchen		X
	TOTAL ERRORS		8	2
CM	detained	detan	X	
	dungeon	dagon	X	
	excellence	excellant	X	
	consequently	c	X	
	medicine	mediance	X	
	merchant	m	X	
	obedient	o	X	
	marriage	marrage		X
	interfere	i	X	
	applause	a	X	
	TOTAL ERRORS		9	1
RM	speechless	speckless	X	
	forehead	forhade		X
	courage	carge	X	
	serious	serouse		X
	develop	devoupe	X	
	understood	understod		X
	excuse	exquse		X
	delicious	delish	X	
	timid	ltnen	X	
	streams	strims	X	
	TOTAL ERRORS		6	4

	WORDS DICTATED	SUBJECT'S SPELLING	DYS	PHONETIC	DYSEIDETIC
KS	administer	adminatser			X
	dungeon	dungen			X
	excellence	exsalint			X
	imaginary	inmaganary			X
	yearning	eunning	X		
	spectacular	spectaculer			X
	customary	costomary			X
	responsible	resonpsable			X
	medicine	medican			X
	interfere	interfear			X
	TOTAL ERRORS		1		9
JL	grotesque	grotles	X		
	nonchalant	nouchart	X		
	inducement	enderscuct	X		
	supplement	supplment			X
	contrasting	constonby	X		
	remarkably	remarkablely			X
	proportional	porporchionol			X
	whimsical	whiscle	X		
	memorandum	menorodom	X		
	twilight	twilght	X		
	TOTAL ERRORS		7		3
TE	continuously	continutionly	X		
	complexion	complexion			X
	compassionate	compashionit			X
	contemporary	contriporary			X
	approximate	approximent			X
	environment	invirement			X
	obedient	obedent			X
	marriage	marriage			X
	interfere	interfeir			X
	fragrant	fragrent			X
	TOTAL ERRORS		1		9

	WORDS DICTATED	SUBJECT'S SPELLING	DYSPHONETIC	DYSEIDETIC
TB	traverse	traver	X	
	affable	affity	X	
	compressible	compresible		X
	excruciating	exshating	X	
	pandemonium	pandenioium		X
	supplement	subliment	X	
	proportional	propornale	X	
	whimsical	whimcical		X
	nucleus	nuclus		X
	prairies	praíses		X
		TOTAL ERRORS		5
MP	prairies	previs		X
	continuously	continulsly		X
	complexion	complation		X
	compassionate	compass	X	
	contemporary	contemary		X
	standardize	standize	X	
	pensive	pencive		X
	society	society		X
	approximate	aprogrmate	X	
	counterfeit	confirt	X	
		TOTAL ERRORS		4

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