IDENTIFICATION OF THE READING DISABLED STUDENT: A FUNCTIONAL STUDY

By

JACKIE R. WOOD

Bachelor of Science
Cameron University
Lawton, Oklahoma
1971

Master of Education
Southwestern Oklahoma State University
Weatherford, Oklahoma
1979

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Graduate College of the
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Thesis Approved:

R. Malatesta Sam

Thesis Adviser

C. Warren McKinney

Charles R Davis

Thomas C. Collins

Dean of the Graduate College

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CHAPTER I

INTRODUCTION

One of the major issues in special education today is the identification of the learning disabled child (Lyon, 1989). Refinement of the Learning Disability definition and early research has caused difficulties. Thus, the result of this refinement has produced more students identified as learning disabled (Adelman & Taylor, 1986). With the passage of the Education for All Handicapped Children Act of 1975, Public Law 94-142, there has been increased interest in the identification process of all handicapped children. Educators and psychologists continue to express concern about their ability to evaluate and diagnose the handicapped child (U.S. Office of Education, 1977, pp. 65082-65085). In 1905, Alfred Binet and Theodore Simon developed a scale that measured general mental development. One of their objectives was to differentiate the "indolent" child from the "inept" child (Sattler, 1974). The plan was to distinguish between the child who is unwilling to learn and the child who is unable to learn. The learning disability field has contemplated the same issue during its evolution; however, there are questions about the strength of its solutions.

When there is a discrepancy between a student's learning potential and their actual academic progress, a decision must be made as to the eligibility and diagnostics concerning

learning disabilities. Often this is defined in quantitative terms and is generally used to identify children with learning disabilities. The Wechsler Intelligence Scale for Children-Revised (WISC-R) (Wechsler, 1974) is the most widely used individually administered intelligence test to estimate children's potential to achieve in school (German, Johnson, & Schneider, 1985). A standardized test of reading ability is most often used to assess a child's achievement in reading (Artley, 1980; Gaskins, 1982; German et al., 1985).

Osgood (1984) expressed concern about using discrepancy formulas derived from the IQ scores in making LD-related decisions. A primary problem is the lack of consensus on the magnitude of the discrepancy between academic achievement and IQ that target LD (Algozzine, Ysseldyke, & Shinn, 1982; Smith, Coleman, Dokecki, & Davis, 1977). A more serious issue, of a fundamental nature, is that decisions reached by using IQ do not typically lead to recommendations regarding remediation, intervention, or treatment (Forness, Sinclair, & Guthrie, 1983). A survey of 333 professionals found little relationship between the diagnostic procedures used by the LD specialist and subsequent remediation techniques (Johnson, Schneider, and German, 1983). Often any decisions regarding eligibility, diagnosis and remediation of LD are treated as separate issues. The use of IQ is frequently limited to making eligibility decisions. This deficiency in the continuity among the LD-related operations can be destructive to educational efforts. Salvia and Ysseldyke (1985) noted reliable assessment procedures should extend

beyond making identification decisions. There should be a logical connection among screening, eligibility-decision making, program planning, pupil progress monitoring, and program evaluation. The lack of such a connection in program elements using IQ as a major assessment tool has been recorded. Adelman and Taylor (1986), in a survey of practitioners, found little evidence to show that LD teachers utilize instructional approaches, materials, and techniques with LD students that are different from those commonly used with any other students.

Theoretical Background

A turning point in the LD field was Public Law 94-142, the Education For All Handicapped Children Act of 1975. This law provided the LD field with its first operational definition. The Education For All Handicapped Children Act (1975) supplies guidelines for the special education of children with various handicapping conditions. This law includes the following definition of learning disability:

> A specific learning disability is a disorder in one or more of the basic psychological processes involved in understanding or using language, spoken or written, which manifests itself in an imperfect ability to listen, think, read, write, spell, or do mathematical calculations. The term includes conditions such as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing or motor handicaps, of mental retardation, or emotional disturbance, or of environmental, cultural or economic disadvantage (Federal Register, 1977, p. 65083)

The significant criteria of the LD definition are:

(a) the discrepancy criteria, (b) the exclusionary criteria, and (c)

the presence of a specific learning disability. The discrepancy criteria of this public law endeavors to distinguish a child with a specific learning difficulty (i.e., LD) from a child with generally reduced intellectual performance. The LD child is considered as having average academic capability but significantly below average academic achievement. This idea implies that a child must have a significant discrepancy between expected achievement, as gathered from performance on an intelligence test, and actual performance, as measured by an achievement or diagnostic test and/or classroom performance (Morris, 1988; Stanovich, 1986, 1988). The ability-achievement approach in determining learning disabled classification is often criticized on the basis that a child must fail before being identified. The term "learning disabilities" has been recognized as a generic one referring to a heterogeneous group of disorders manifesting themselves in various academic difficulties (Hammill, Leigh, McNutt, & Larsen, 1981). The identification of LD students is often erroneous (Rivers & Smith, 1988). Perhaps as few as half the students identified as LD meet the traditional eligibility requirements (Gelzheiser, 1987). Many students who would have been labeled as "reading disabled/dyslexic" are now categorized as LD. About 60-80% of LD students have reading problems (Jones, Torgesen & Sexton 1987), with approximately 75% of them having a reading disability as their primary deficit (Kavale & Forness, 1985). For the purpose of this study the terms LD, RD and Dyslexia will be used interchangeably. The area of reading disability as a learning disability has prompted other issues concerning the discrepancy

criterion: (a) what are the cutoff IQ scores for borderline IQs of 70, 80 or 90 and (b) whether reading achievement is to be defined as word recognition skills or reading comprehension skills? There is extensive debate among LD researchers concerning both of these issues (Stanovich, 1989; Siegel, 1986, 1989).

Exclusionary criteria presents a second problem with the LD definition. In the Education For All Handicapped Children Act (1975), the LD definition excludes children who have learning disabilities but are primarily the result of sensory or motor handicaps, mental retardation, emotional disturbance, or environmental, social or economic disadvantage. The employment of these criteria initiate more questions. To what degree of significance must the hearing loss or visual acuity deficit be for exclusion from an LD diagnosis? How can we account for a temporary hearing loss (e.g., chronic ear infections) and the role hearing loss may play in a child's language development when it is believed that language development is a bridge with reading achievement? Can one distinguish between a primary emotional disturbance and emotional or behavioral problems secondary to the learning disability? Can it be determined which condition came first? Research conclusions on this point are ambivalent (Torgesen, 1988). Exclusion of environmentally disadvantaged children could make it improbable for a child from a low socioeconomic background to be identified as learning disabled (Morris, 1988).

One of the key assumptions of the LD field is that learning disabilities are the effect of specific impairments in cognitive

abilities. These impairments are believed to affect a limited range of academic assignments but do not have an extensive influence on general intellectual level (Torgesen, 1989).

There are many reasons other than the presence of a specific learning disability for children to be underachieving. Research evidence implies that the LD category is basically a category of underachievement (Ysseldyke, Algozzine, Shinn, and McGue, 1982). Algozzine and Sutherland (1977) remarked that the current LD definition has opened the door for significant over identification of LD children. Albeit, children with reading disabilities comprise the majority of the LD population, even though some children may be served in LD classes for reasons other than a specific learning disability. Gerald Coles (1987), in his book The Learning Mystique: A Critical Look at "Learning Disabilities", explained that the learning disability field was practically nonexistent until the mid-1960's. Millions of children have been identified as LD during the past twenty years. In 1977 only 1.89% of the total school enrollment across the United States had been classified as LD. This can be compared with 1984 when 4.63% of the total school population were classified as LD (Lerner, 1988). Several LD researchers have probed the discrepancy-exclusionary definitions of a learning disabled child (Coles, 1989; Morris, 1988). These LD definitional restrictions may lead to the misdiagnosis of some children as having a specific learning disability, when in fact they may be underachieving for other reasons. It is possible that there are some children underachieving due to behavioral problems. These

children may be underachieving because of the underdevelopment of behaviors important in academic achievement such as time on task, task perseverance, and delay of gratification.

Reading Disabilities

The majority of the LD population consist of children with reading disabilities (Aaron, 1991). Some children are diagnosed LD for other reasons, such as trouble with math or an inability to express themselves in writing. Reading disability and dyslexia are interchangeable terms indicating serious reading underachievement. According to Snowling (1987), the most commonly used definition for dyslexia is that of the World Federation of Neurology which defines it as ". . . a disorder manifested by difficulty in learning to read despite conventional instruction, adequate intelligence and sociocultural opportunity" (p. 78).

The etiologies or causes of reading disabilities are varied. Stanovich (1986) submits that reading is an extremely complex interactive process that involves both external and internal factors for the reader. External factors might be text readability, the child's previous print experience, and instructional quality. Internal factors such as language development, phonological awareness, decoding speed, short-term memory are important to a child's reading skills. Phonological awareness can be defined as a child's ability to segment the speech stream into phonemes or isolated sounds (Stanovich, 1988).

Statement of the Problem

A widely accepted conclusion for reading disability includes two fundamental components: (1) decoding and (2) comprehension (Frith & Snowling, 1983). These two segments are assumed to be independent (Frith & Snowling, 1983). A weakness in either one of these two segments is likely to affect reading. Poor reading performance could be the effect of weak decoding skills, poor comprehension ability, or a combination of both (Spring & French, 1990). Aaron (1991) describes three types of poor readers: (1) those with poor decoding but adequate comprehension, (2) those with poor comprehension but adequate decoding skills, and (3) those with poor decoding and poor comprehension skills.

Research supporting of the proposition that reading is made up of two components comes from several sources including experimental, developmental, neuropsychological, and genetic studies. Shankweiler and Crain (1986) suggested listening comprehension problems occur in individuals with reading disabilities (RD) on sentence processing tasks.

They further suggested word-decoding problems of disabled readers impose an additional demand on comprehension during reading. Disabled readers of normal intelligence are also deficient on listening tasks requiring single spoken sentence comprehension (Fletcher, Satz, and Scholes, 1981; Mann, Shankweiler, and Smith, 1984; Smith, Mann, and Shankweiler, 1986; Stein, Cains, and Zurif, 1984; Vogel, 1975).

Individually administered intelligence tests, such as the Weschsler Intelligence Scale for Children-Revised (WISC-R), are used to predict a child's academic abilities in school (Siegel, 1989). While discussing reading disability and IQ scores, Aaron (1991) maintained that many children whose reading achievement is discrepant from their IQ score are identified as have a learning disability.

Siegel (1989) recently questioned the validity of the use of IQ scores in defining LD. She argued that IQ is irrelevant to the definition of LD. Other findings indicate little relationship between diagnostic methods used by LD specialists and the resultant remediation techniques (Johnson, Schneider, and German, 1983). Aaron (1991) stated that the use of IQ is often limited to making eligibility decisions. This lack of continuity among the LD-related operations can be detrimental to educational efforts. Some researchers suggest that the use of an IQ achievement score is irrelevant in the development of teaching programs (Spring and French, 1990).

Spring and French (1990) called for a new method of identifying children with specific reading disabilities. A variety of research has contributed a better understanding of reading disability. However, there is still a need for consolidation of the causes and treatments of reading disability (Wixon and Lipson, 1991).

Purpose and Justification of the Study

The purpose of this study is to explore a potential screening procedure to identify reading disabled students. There is an obvious need for an effective, efficient screening procedure that will recognize the reading disabled student from the general school population. This study was designed to be relevant and applicable to current practices in reading disability screening and educational program planning in the public school setting. The high correlation between listening comprehension and reading comprehension have led many researchers to recommend that listening comprehension is a viable means of approximating reading comprehension (Carroll, 1977; Durrell & Hayes, 1969). It is the intention of this study to add support as well as supplementary information to the already existing body of knowledge concerning reading disabilities.

Other studies utilized the method of detecting a discrepancy between listening and reading comprehension scores compared to the traditional method of identification which is based on a discrepancy between intelligence and reading scores to identify reading disabilities.

Limitations of the Study

The following limitations are inherent in this study.

1. This study utilized students from a middle size public school system in a south central state. The inference of study results to other populations may therefore be limited.

2. A number of the subjects in this study were from primarily low socioeconomic status families in a middle size city in a south central state. The inference of study results to other populations may therefore be limited.

3. This study utilized only third and fifth-grade students and the inference of study results to other populations is limited.

Definition of Terms

Terms as used in this study are defined below:

Dyslexia shall mean a specific learning disability in the area of reading.

Learning disability shall mean an identified disorder in one or more of the following areas: reading, writing, speaking, thinking, or mathematics.

Nondisabled reader shall mean a person or group of persons not previously identified as experiencing a specific deficit in the area of reading.

Reading shall mean the act of drawing meaning from the printed page.

Reading disability shall mean reading achievement that is significantly below expectancy for both age and learning potential and is disparate with the learner's cultural, linguistic, and educational experience. Reading Disabled/Dyslexic and Learning Disabled will be used interchangeably.

Reading status shall mean the classification of study participants as reading disabled or nondisabled reader, as determined by previous identification.

Hypotheses

Hypothesis 1: There will be a significant difference between the mean Reading Comprehension and Listening Comprehension scores of the disabled readers and nondisabled readers on the Reading Comprehension subtest of the Peabody Individual Achievement Test-Revised (PIAT-R) (Markwardt, 1989).

Hypothesis 2: There will be a significant difference between the mean Reading Comprehension and Listening Comprehension scores of the disabled readers and nondisabled readers on the Reading Passage Comprehension Form G and Form H subtests of the Woodcock Reading Mastery Test-Revised (WRMT-R) (Woodcock, 1987).

Hypothesis 3: There will be a significant difference between the mean scores of the disabled readers and nondisabled readers on the Reading and Listening Comprehension subtests of the Weschler Individual Achievement Test (WIAT) (The Psychological Corporation, 1992).

Hypothesis 4: There will be a statistically significant relationship between the Reading Comprehension and Listening Comprehension subtests of the modified Peabody Individual Achievement Test (PIAT) (Markwardt, 1989) and the Reading Comprehension and Listening Comprehension subtests of the modified Woodcock Reading Mastery Test-Revised (WRMT-R).

Hypothesis 5: There will be a statistically significant relationship between the Reading Comprehension and Listening Comprehension subtests of the modified Peabody Individual Achievement Test-Revised (PIAT-R) (Markwardt, 1989) and the Reading Comprehension and Listening Comprehension subtests of the Wechsler Individual Achievement Test (WIAT) (The Psychological Corporation, 1992).

Hypothesis 6: There will be a statistically significant relationship between the Reading Comprehension and Listening Comprehension subtests of the modified Woodcock Reading Mastery Test-Revised (WRMT-R) (Woodcock, 1987) Form G and Form H and the Reading Comprehension and Listening Comprehension subtests of the Wechsler Individual Achievement Test (WIAT).

Organization of the Study

Chapter I introduced the study, its theoretical foundation, stated the problem and its significance, specified the limitations of the study, and delineated the hypotheses to be tested. Chapter II contains a review of the literature. Chapter III presents the methodology and instrumentation used in the study. Chapter IV will present the results of the study. Chapter V will discuss and summarize the findings of the research and present conclusions and recommendations for future research.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

No one fully understands the extraordinarily complex ability known as reading. This is expected since reading is a cognitive process that occurs quickly and privately in the mind. The human mind is complex and our nominal ability to understand its workings, and our incomplete understanding of the reading process is understandable (Anderson & Freebody, 1985).

This chapter contains a review of the literature relevant to this study. It is divided into three main sections. The first section includes a discussion of the current research in reading. The second section discusses some of the early investigations of reading disabilities. The final section reviews the research literature on current challenges to the identification of the reading disabled student.

Current Research in Reading

According to Orasanu and Penney (1986), it is only during the last one hundred years that scientific inquiry into the reading process has seriously been conducted, although efforts in reading instruction have been ongoing for more than 5000 years. Most of the research in this country, by the end of the 19th century, focussed

on early reading, or "learning the code" (Resnick & Weaver, 1979, p. 5). The beginning assumptions of reading instruction were that readers proceed letter by letter to unlock sounds, then combine sounds into words, and words into sentences. Then, once the sentences are in oral form, comprehension will take place automatically. From this position, the major instructional goal is to teach readers to learn the letter-sound code.

Gibson and Levin (1975) describe reading as the obtaining of information from the text. Reading is a very complicated and multi-faceted process. Chall (1983) defines the phases of reading development as follows:

Phase 1 - Initial Reading or Decoding (Grades 1 and 2; ages 6 and 7) - learning that words are spelled with certain letters that go with the spoken word

Phase 2 - Confirmation Fluency Stage (Grades 3 and 4; ages 7 and 8) - confirmation of decoding process and becoming familiar with the printed page

Phase 3 - Reading for New Knowledge (Grades 4-7; ages 9 -13) - using decoding to gain new knowledge or content

Phase 4 - Multiple Viewpoints (High School; Ages 14-18) - recognize multiple viewpoints and expand types of reading

Phase 5 - Construction of World View (College; ages 18 up) - evaluate abstract information with respect to personal perspective of the world

The procedure of learning to read may be divided into two phases, the acquisition of word recognition skills and the formation of reading comprehension skills (Lerner, 1981). Word recognition or decoding is regarded as an earlier level reading skill, while comprehension is regarded as a later higher level reading skill.

Comprehension is the purpose of reading. Comprehension involves the understanding of meaning in reading. Reading comprehension is described by Lerner (1981) as having various levels. These levels of comprehension are: literal comprehension (skill to understand the direct stated ideas), interpretation (acquiring meaning from the implied, as well as the stated), critical reading (investigation, generalization, and association of ideas), and creative reading (formation of new ideas and insights).

Lerner (1981) refers to reading comprehension as "the heart of reading" (p. 311). Golinkoff (1976) used the broad areas of decoding, lexical access, and text organization as a framework for discussion in a review of research involving comprehension in good and poor readers ". . . text comprehension relies upon the decoding or recognition of individual words, the access of the meaning of those words in long term semantic memory, and the extraction of the relations which hold between the words" (p. 638).

The process of reading is composed of many integral skills. The well-versed reader coordinates these skills with exactness and speed, the processing of the subskills are automatic and requiring little attention. Such automatic process of subskills is critical to the successful operation of the complex skill of reading.

Without automaticity of the component skills, attention overload and disfluency are manifested in the reading process (Durkin, 1981).

The concept of comprehension is restricted to gathering the main idea of a paragraph. Within the last fifteen to twenty years, however, new research has changed these traditional comprehension theories (Orasanu and Penny, 1986). The new view of reading emphasizes active construction of meaning from text. While it doesn't deny the importance of smooth decoding, decoding is viewed as a way of gaining meaning rather than end in itself. The new view of reading emphasizes active construction of meaning from the text. When using the new view of reading, a child is told to try to think of a prior experience that will bring to mind something they may know based on the title and headings. As a child begins reading they recognize familiar words with automaticity, less familiar words are recognized by common letters or clusters. This insight is based on the students understanding that certain words will occur dependant upon their prior knowledge and what has already been read. When the child draws upon background knowledge, they can construct a sensible interpretation of what is written on the page. In the old view of reading, meaning stays on the printed page, whereas in the new view the reader creates meaning in their mind dependent upon the text and their prior knowledge of the content, language and structure.

Instructional goals from this perspective are distinctly different. While the need to develop fluent decoding skills is assumed, emphasis is on the need for readers to gain strategies for

inferring the author's message, using the information written on the page with the readers' prior knowledge (Perfetti, 1985). The process of reading becomes an interactive one between the reader and the text, rather than the acquisition of sequentially developed reading skills (McClelland & Rumelhart, 1981; Just & Carpenter, 1978; Stanovich, 1980).

According to Carlisle (1989), reading and listening are both receptive language skills. Receptive language skills play a vital role in children's adjustments to normal classrooms and learning in those classrooms. Students who have difficulty listening, as well as those who have difficulty reading, also may have difficulty learning.

Carlisle suggested that the assessment of students with difficulties in reading comprehension should include a measure of both listening and reading comprehension. Several reading researchers have suggested that comparisons of listening and reading performances can determine the source of reading comprehension deficiencies (Calfee & Funderburg, 1988: Samuels 1987; Stict 1979; Stict & James 1984). Stict (1986) suggests that language development forms the structure on which reading comprehension skills progress. He argues that when a student's listening achievement is proper for his or her grade level but reading comprehension achievement lags seriously behind the student is having difficulty learning basic word recognition skills needed for efficient and meaningful reading.

Reading Disabilities

Children with learning disabilities have difficulty with many academic areas; however, poor reading is the most consistently reported problem of the learning disabled student (Aaron & Joshi, 1992). Historically, interpretations of reading disabilities, or dyslexia, changed with the influence of each discipline that focused on it. Explanations citing linguistic, visual, neurological and psychological processing difficulties as either single-factor or multi-factor theories (Vellutino, 1978) resulted.

Investigations of reading disabilities can be evidenced to an English physician, Morgan (Pelosi, 1977). In 1896, Morgan published a paper on his work with a nonreader who appeared to have normal intelligence. Morgan used the term "congenital word blindness" to describe the boy's condition.

In 1917 Hinshelwood (Lerner, 1981), a Glasgow eye surgeon, reported a condition that he alluded to as congenital word blindness. Hinshelwood (Lerner, 1981) suggested that word blindness was due to a disorder of the visual centers of the brain. This early attention to reading disability by the medical profession gained little interest from psychologists and educators.

The first published report in the United States of an endeavor to diagnose individual reading problems and prescribe treatment came from Uhl (1916). Bronner (1917) reported that some children who could decode written words with surprising ease could not comprehend what they had read. Schmitt (1918) detailed a functional phonic method for teaching nonreaders. Fernald and Keller (1921) described

the kinesthetic method. Gray (1922) published the first books on reading disability in America. Gates (1927) produced the first battery of diagnostic reading tests (Lerner, 1981).

Another influential voice during the mid 1900's was that of Samuel Orton, an American psychiatrist, neurologist and neuropathologist. With his primary interest in children's disorders, he is perhaps more closely associated with the perceptual interpretations of dyslexia due to the influence of his followers. Orton introduced the term "strephosymbolia," meaning "twisted symbol" to emphasize the orientation confusions and the visual sequential memory problems seen in this population. In addition, dyslexics showed delays and/or defects in several language areas, incomplete cerebral dominance problems with gross and fine motor coordination, and domestic histories of language disorders. Orton theorized that delayed or incomplete cerebral dominance was a causal factor in dyslexia. In fact, many of the early investigations of reading disabilities were falsely based on the assumption that reading was primarily a visual skill (Orton, 1937). This misinterpretation continues to be the layman's explanation of dyslexia.

Bender (Critchley, 1981), changed Orton's notion of developmental lag with that of "maturation lag." Based on extensive research of the neurological and conceptual development of children five to seven years of age, she reported that many dyslexics demonstrated "soft neurological signs." She further referred to the finding that many were slower than peers to develop right-left

orientation involving body image. They were slower, as well, in motor development, language development and impulsivity control.

Related investigation of perceptual skills was reported by Kurt Goldstein, a German physician studying head injuries during World War I. His major contribution to the field of reading disabilities and specifically to dyslexia, was the notion of perceptual handicaps. Goldsteins's ideas can be traced through the work of Strauss and Lehtinen and the later theories of Lehtinen and Kephart (Bryan & Bryan, 1975). Strauss and Lehtinen (1947) shifted their study of brain damage from adults to children and contributed several theories relating neurological deficits with children's learning difficulties. Strauss and his colleague Kephart viewed dyslexia as the result of visual perceptual disturbances (Bryan & Bryan, 1975).

In 1896 when dyslexia was first known, it was primarily connected with language disturbances until the influence of Strauss and Lehtinen (1947). In the 1950's and 1960's, viewpoints diverged with a focus on the visual perceptual aspects of dyslexia (McCarthy & McCarthy, 1970).

Current research suggests that visual perceptual theories may not be a valid explanation of dyslexia (Vellutino, 1979). Investigation of dyslexic syndromes suggests that the disorder may be heterogeneous (Mattis, French & Rapin, 1975).

The presumption that underlies most discussions of dyslexia, even if not stated explicitly, is that a child with learning disability has a brain cognitive deficit logically specific to the

reading task (Stanovich, 1988). This indicates that the deficits exhibited by dyslexic children do not influence their overall cognitive ability. If the brain-associated deficits stretch into other domains of the dyslexics' cognitive abilities, then they would suppress their overall abilities (intelligence) resulting in a reduction of any discrepancy between reading skills and overall intelligence (Snowling, 1987). Snowling explains that discrepancy between reading skills and overall intelligence is the center of the dyslexic definition, and distinguishes the dyslexic child from the low average poor reader.

Several attempts have been made to define subtypes of reading disabilities. These attempts have been based on non-reading inadequacies, such as perceptual or language skills. Either alone, or in conjunction with reading deficits, contribute to reading problems. Others are based on neuropsychological assessments (Malatesha & Dougan, 1982).

Harris (1981) examined reading disability research concerning both single cause (Orton, 1937; Witelson, 1976; Levinson, 1980) and multiple causes (Johnson & Myklebust, 1967; Boder, 1973; Mattis, French, & Rapin, 1975; Gaddes, 1980). Harris noted three major types of reading disability: a language deficit group, a perceptual deficit group, and a verbally nonfluent group. The first language group is characterized by an extensive deficiency in language skills, normal visual and visual-motor skills, and a lower Verbal than Performance IQ. The language deficit in this group exhibits itself in poor listening comprehension, restricted vocabulary,

problems in verbal expression, limited understanding of sentence structure, faulty auditory discrimination and memory, and inadequate blending ability. The second group perceptual deficit is illustrated by problems in visual perception and visual-motor skills, obviously normal language abilities, and a higher Verbal than Performance IQ. The third verbally nonfluent group has denoted by a deficit in verbal abilities, but normal verbal comprehension and vocabulary. A fourth group also subsequently emerged: an unexpected subtype whose cognitive capabilities fail to show any significant deficiencies that explain reading failure (Satz & Morris, 1980).

Boder (1973) defined three subtypes of disabled readers based on atypical reading-spelling patterns. The first group, dyseidetic dyslexics, exhibited phonetic strengths, but showed visual-spatial weaknesses. These students could read phonetically regular words more easily than non-phonetic words, and used phonetic principles when spelling. Dysphonetic dyslexics exhibited visual-spatial strengths but did not effectively use phonics. These students count on a sight vocabulary approach to reading, and appear to use visual memory skills for spelling more than phonetic rules. Mixed dysphonetic-dyseidetic dyslexics presented difficulty processing text through phonetic and visual means.

Lovett (1984) identified students referred with specific reading dysfunction as "accuracy disabled" or "rate" disabled according to standards developed from a reading skill information processing model. She established that knowledge of morphology and

syntax was significantly predictive of written language and dysfunction for the accuracy disabled student. The quickness with which they could furnish names for single or multiple part visual arrays predicted the level of written language ability for the rate disabled children. Lovett (1984) suggested the accuracy/rate separation could be seen as an initial diagnostic step in recognizing where on a theoretical continuum of normal reading development the dyslexic child is handicapped.

Holder (1987) utilized multivariate empirical techniques to student neuropsychological test data. He found three subtypes of reading disabled subjects at two age levels, 6 to 8 years and 9 to 14 years. At both tiers a "left hemisphere deficit" and "minimal deficit" subtype were acquired. At the younger level, the third subtype surfaced was portrayed by appropriately strong verbal abilities as contrasted to spatial abilities. At the older level, a "mixed deficit" subtype surfaced.

McKinney (1984) analyzed research on subtypes of learning disabled children and found the evidence argued against a "single syndrome" theory. McKinney gathered from the literature four subtypes of LD children. Subtype I was identified by an intellectual profile of average verbal skills with deficiencies in sequential and spatial skills, a behavioral profile marking deficiencies in independence and task-orientation, strengths on conceptual subtests of the WISC-R, and mild handicap in reading recognition and mathematics. Subtype II was particularly impaired on the general information, arithmetic, and picture arrangement

subtests of the WISC-R and significantly impaired in achievement and behavioral ratings. Subtype III, almost exclusively male, was described by above average conceptual skills and behavioral deficiencies. Subtype IV was comparable in intellectual profile to Subtype I but demonstrated no concomitant behavioral deficiencies. McKinney (1984) proposed these findings strengthened the possibility of creating more homogeneous diagnostic groups within the immense LD category.

Fisk and Rourke (1983) discovered evidence of subtypes of LD children that are homogeneous, not only with respect to the neuropsychological abilities and deficiencies paradigm, but also with regard to the quality and modeling of academic abilities and intervention strategy demands.

Lyon (1985) identified subtypes of learning disabled readers (LDR) by using a battery of auditory receptive and auditory expressive language, visual perceptual, memory and integration tasks. Within this identification, Lyon distinguished six subtypes comprising different patterns of strength and weakness in these three areas (Lyon & Watson, 1981). This research led to the fact that not all LDR children manifested the same pattern of oral language, memory and perceptual deficits, nor did they respond equally well to the same teaching tactics. Lyon stressed the complexity of diagnosing and instructing LDR children:

> What is indicated from these studies is that reading is an exceedingly complex and difficult task for those who are not inherently able to efficiently and automatically decipher its code. For these children, even the most well thought out sequence of instruction and the most powerful application of reinforcement

> principles will not reduce the complexity and difficulty unless a systematic analysis of the interface between learner characteristics and task demands is carried out (p. 34).

Current Challenges

Byrne (1992) established that by generating an explanation of reading success, researchers are in a better position to study reading failure. This is positively representative of most of the research in this area. One of the most vigorous findings in reading research over the past few decades is the strong support that has prompted researchers to explore alternative criteria and procedures that could be used in making decisions considering LD. Shinn (1989) stated the need for curriculum-based measurements. Another study (Brown & Campione, 1986) produced an attempt to develop assessment tools that are based on the components that make up the academic skill under inquiry. The component-based diagnostic approach has the benefit of leading immediately to suggestions regarding corrective instruction. Information gathered using component-based assessment tools can also be used to make eligibility determinations, yet those decisions are usually controlled by administrative and fiscal pressures rather than psychological needs (Aaron, 1991).

Batsche (1984) questioned the "traditional" approach to assessment, decision-making and report writing, suggesting reasons for referral or the type of evaluation sought. Reacting to a referral form with a vague summary of a student's academic and/or behavioral difficulties, a school psychologist, constrained by a

lack of time and referral specificity, directs a required evaluation. Albeit such an approach might contribute a uniformity and consistency to assessment across children, Batsch proposed that it served little purpose in answering specific questions about student function and dysfunction. Batsche referred to numerous disadvantages to using this traditional assessment approach. They include:

- the impossibility of adapting this model across a variety of evaluation formats and reasons for referrals
- the model is not likely to answer referral reasons in ways that lead to interventions
- the model does not take into consideration disparities in student background and environmental differences
- the model is likely to lead to "placement" options rather than intervention strategies
- the model is not likely to employ a multi-trait, multi-method format (p. 3).

Other researchers, including Galagan (1985) and Reschly (1988), authenticated that the assessment process, when focused on determining eligibility for categorical services, is of minimal use for planning instructional interventions. Reschly (1988) examined the quality and usefulness of assessment information collected during preplacement evaluations. Many tests presently used in assessment are of debatable technical adequacy (Reschly, 1980; Ysseldyke, Thurlow, Graden, Wesson, Algozzine, & Deno, 1983). The Wechsler Scales are technically adequate for estimating general intellectual functioning.

A survey of the practices of learning disability and reading disability specialists (German, Johnson & Schneider 1985) indicates tests including a measure of listening comprehension are

infrequently used. An examination of several textbooks used to train diagnosticians (Salvia & Yeseldyke 1988; Taylor 1984) indicated listening comprehension is not discussed as a regular component of a reading skills assessment. When a student is referred for difficulties with reading comprehension, diagnosticians test word recognition, oral reading, and passage comprehension. It is assumed that if the student cannot recognize words quickly and accurately, comprehension problems are attributable to the decoding deficiency. Any further analysis of comprehension abilities is usually not undertaken by the diagnostians.

Several reasons exist for the omission of tests of listening passage comprehension from assessment batteries. Good tests of listening and reading are simply not available among published standardized tests (Farr and Carey 1986). Lack of interest in reading/listening tests among critics indicate a lowered view of the importance of comparing listening and reading skills (Danks and Pezdek 1980; Rubin 1980). Experts consider that since listening and reading place such different processing demands on the individual, meaningful comparisons cannot be made.

Reading comprehension views have changed. With these changes have come concerns about both assessment and instruction. No longer is comprehension widely viewed as the product of reading. Instead, comprehension is considered to be a process whereby a reader mentally formulates a representation of the author's intended meaning (Carlisle, 1989). Understanding is conditional on the presence of numerous interviewing variables, including task,

materials, context, and individual characteristics (Idol 1988; Samuels 1987). The present problem is to devise reasonable assessment methods given the presence of intervening factors that affect comprehension.

What is the effect of prior knowledge on comprehension? Researchers suggest a person's knowledge about a topic can have a pronounced effect on passage comprehension (Berger 1978). Background information and experiences may produce a different understanding of text. Scores on standardized tests of reading may reflect something other than a person's general comprehension abilities (Johnston 1984; Valencia & Pearson 1988).

Better comprehension tests also employ texts developmentally appropriate in content and structure (Horowitz & Samuels, 1987). The passages must place similar demands on the child, whether during listening or reading. The level of difficulty of the vocabulary and the difficulty of sentences should be matched and generally suitable for both listening and reading. We need to pay attention to a child's abilities to meet demands placed on them when listening to or reading school lessons. One goal might be to test comprehension of passages that resemble those used in classroom lectures and school textbooks in both information and structure.

Comprehension tasks, designed to give information about what the listener-reader has understood, place different demands on students. Answering questions has been shown to influence test-taking strategies (Gold & Fleischer, 1986). Cloze procedure centers on word knowledge judgment and forces sentence comprehension

strategies, rather than the integration of information in an extended manner (Fuchs, Fuchs, & Maxwell 1988; Johnston 1983). Word recall places similar demands on memory and expressive language, so that students with deficits in these areas may appear to have very poor comprehension (Fuchs, Fuchs, & Maxwell 1988; Johnston 1983). A more direct measure of comprehension is possible. This comprehension test should be uncontaminated by test-taking strategies as well as expressive language capabilities. There is a need for tests that directly compare listening and reading comprehension. Tests so constructed should reflect current listening and reading comprehension theory as well as reflect content and structure of text passage selection.

Jackson and McClelland (1979) examined the speed of information-processing and found that comprehension ability and reaction time in a letter-matching task accounted for nearly all of the variance in the subjects' reading ability.

Their investigation focused on separate central processes rather than sensory processes (i.e. eye movements) that could reinforce both effective reading and the accumulation of information from the content of a solitary fixation.

If reading relies on a hierarchial arrangement of sub-processes that contain analyses first for visual characteristic and proceeds to letter-word, semantic-syntactic, and conceptual levels of analyses, it is feasible faster readers construct suitable higher level illustrations more quickly. This inquiry looked at speed of

forming visual letter codes, letter identity codes, semantic word codes, and verbal word codes.

The sample population consisted of fifty-two freshman and sophomore college students who were examined to distinguish a group of fast readers and average readers based on reading speed and effectual comprehension. The faster readers were noted to be reading faster and comprehending better. The students were examined on a long passage reading test and a short passage reading test. In addition to the two reading tests, the study included speed of encoding visual information tasks and analysis of sensory functions, verbal and quantitative reasoning ability, short-term auditory memory span, and ability to understand spoken text.

The outcome of the reaction time data disclose fast readers had an advantage over slow readers in every task and the contrast expanded in size with the average amount of decision time required. These sensory tasks displayed no representative relation to reading ability. Faster readers were also more exact in verbal and quantitative reasoning, short-term auditory memory, and speech comprehension. The correlation and regression analyses show listening comprehension is highly correlated with effective reading speed, demonstrating that for these subjects, independent, language comprehension skills. A second experiment matched fast and average readers on a homophone task using pseudowords as stimuli rather than homonyms. Outcomes on this task do not lend support for the ideas that individual reading ability differences are dependent upon phonological encoding processes but rather are dependent upon

letter-code access ability as a preparatory step to phonological encoding.

It would appear that the measurement of a discrepancy between listening and reading comprehension would seem to be direct. This idea, however, is complicated by reports that the verbal comprehension problems of students with specific reading disabilities are not limited to reading. Shankweiler and Crain (1986) implied that listening comprehension difficulty might arise in individuals with reading disabilities (RD) on sentence processing tasks that inflict uncommonly severe requirements on working memory. They subsequently suggested that the word-decoding difficulty of disabled readers inflict an additional demand on working memory during reading. Perfetti and Lesgold (1977) reported that it would be possible for a disabled reader to comprehend a spoken sentence that did not place excessive stress upon working memory, yet be unable to comprehend a similar printed sentence even though each word in the printed sentence was decoded correctly.

In a recent study by Spring and French (1990), a procedure of identifying children with specific reading disabilities by identifying discrepancies between their reading and listening comprehension scores. This validation was conducted with disabled and nondisabled readers in Grades 4, 5, and 6. This study was based on the use of a modified version of the reading comprehension subtest of the Peabody Individual Achievement Test (Markwardt, 1987). The fundamental focus of this study was the comparability of individuals with and without RD on a measure of the discrepancy

between reading and listening comprehension. The authors were able to support a significant group-by-modality interaction. Whereas reading and listening scores of nondisabled readers did not vary significantly, reading scores were significantly more decreased than listening scores in the RD group.

The premise behind a study by Aaron (1991) was to generate normative data to be utilized in an assessment procedure that was designed to diagnose the different forms of reading disabilities without resorting to the use of IQ tests. In this study the experimenter utilized data obtained by administering reading tests and reading related task as the diagnostic procedure. One hundred and eighty children, Grades 3 through 8, were used to obtain the data. In this study the correlation coefficients between reading and listening comprehension ranged from .58 to .74 which indicates consistency with those reported by other investigators. These results led Aaron (1991) to the conclusion that 34% to 55% of the variability seen in reading comprehension could be accounted for by listening comprehension. Upon the combination of all the grades it was found that listening comprehension accounted for 53.3% of the variability found in reading comprehension. Aaron (1991) observed that one of the advantages of this assessment procedure is that it can lead to recommendations concerning remediation and treatment.

Summary

The area of Reading Disabilities has come a long way in the past few years. This review of literature indicates that reading is

an exceedingly complex and difficult task for those who are not inherently able to efficiently and automatically interpret its code. In order to establish an historical framework, a summary of the early literature relating to reading disability was presented in this chapter. A review of the literature related to the identification of the reading disabled student showed general agreement that good assessment practice should extend beyond merely making placement decisions. Each study supplied more pieces to the puzzle of the assessment procedure for the identification of the reading disabled student.

Chapter III will be concerned with the design of this study. Information on the instruments used, the population studies, the variables considered, the procedure of the study, and the statistical methods utilized will be discussed.

CHAPTER III

METHOD

Introduction

The purpose of this study is to determine if children with specific reading disabilities can be identified from their reading and listening comprehension scores discrepancies. This chapter discusses the subjects to be studied, instruments and procedures used to assess reading ability and data analysis procedures.

Subjects

The population for this study involves four groups of students: Grade 3 reading disabled and nondisabled reader, Grade 5 reading disabled and nondisabled reader. Study participants were selected from Grade 3 and Grade 5 students who attend a public school system in a mid-size community in the midwest. After administrative permission was received, the purpose and procedures of the research project was described to several teachers of Grade 3 and Grade 5 students. Parental permission was granted before the testing of the student. Information concerning the purpose of the study project, tests to be administered, time required, and confidentiality was provided to parents of participating students. A copy of the Informed Consent Form is included in Appendix A.

The reading disability groups are composed of 30 third grade students and 30 fifth grade students. The students had been previously identified as learning disabled (with a specific deficit in reading) by an evaluation administered by a school psychometrist and a Team Evaluation. It is important to note that in the public school system from which study participants were drawn, eligibility for receiving special education programming is determined by a multi-disciplinary team evaluation. The team considers age, achievement level, grade level, capabilities, and test scatter analysis. The nondisabled reader groups are composed of 30 third grade students and 30 fifth grade students. None of the nondisabled reader students had been identified as experiencing a reading disability.

In order to reduce confounding variables, additional criteria for student participation in the reading disabled or nondisabled reader groups included the following:

1. Thirty subjects in third grade and in fifth grade that have been identified as Learning Disabled and are currently receiving at least 30 minutes of special education programming per day.

2. Thirty subjects in third grade and in fifth grade that are reading at the age appropriate levels in reading as measured by the Iowa Test of Basic Skill, Form G (ITBS, G) (1985).

3. Evaluated by School Nurses as being free of gross visual, speech, and/or hearing disabilities.

4. English as the primary language.

Table I indicates the characteristics for the reading and nondisabled reader students.

Instruments

Peabody Individual Achievement Test-Revised

The Peabody Individual Achievement Test-Revised (PIAT-R) (Dunn & Markwardt, 1989) is an individually administered test designed to provide a wide-range screening measure of academic achievement. The standardization sample consisted of 2,899 children, at least 200 at each of the thirteen grade levels. Twenty-nine school districts participated based upon their geographic region and community size.

Test-retest reliability coefficients range from .64 to .89 and a correlation coefficient of .95 with the WRAT.

All subjects were individually administered a modified version of the Peabody Individual Achievement Test (PIAT) Reading Comprehension subtest. The original version of this subtest includes 100 items, each item contains a single sentence on one page of a test booklet, with four pictures on the next page. The items are arranged in order of difficulty, covering a range of reading abilities from Grade 1.9 to Grade 12.8. In the original version, students are requested to read each sentence. The examiner then turns the page and shows four pictures, and students are asked to point to the picture that best illustrates the event described in the sentence. For the modified version, the subtest is divided into two forms. Form A follows a modified procedure, with students

TABLE I

CHARACTERISTICS OF READING DISABLED AND NONDISABLED READER STUDENTS

Subject Characteristics	Grade	Reading Disabled	Nonreading Nondisabled
n =		60	60
Age in Months	Grade 3	117.06 (SD 6.15)	107.33 (SD 6.28)
	Grade 5	136.20 (SD 6.87)	133.43 (SD 4.99)
Grade Three n=		30	30
Grade Five n=		30	30
Reading Level: Iowa Test of Basic Skills	Grade 3	*	3.7
	Grade 5	*	5.9

* Note: Determined by a student's prior identification as experiencing a specific learning disability in the area of reading by a multi-disciplinary team evaluation.

listening as the researcher reads each sentence aloud. On Form B, nevertheless, as in the original version of the test, subjects were required to read each sentence. Form A contained all odd-numbered items plus sample items A and C. Form B consisted of all even-numbered items plus sample items B and D. The score for each form is the total number of correct answers accumulated before reaching the stopping criterion (PIAT-R manual, p. 8).

Standard instructions were revised to conform to these alterations. All students were administered both comprehension tests. The items in each form were presented sequentially, starting with two practice items. On the listening test (Form A), the students were not allowed to see sentences as they were read by the researcher, but the researcher was permitted to repeat sentences if the student so requested. On the reading test (Form B), the students were allowed to read sentences silently or aloud and were also able to reread the sentences. Hence, coinciding procedures were followed. The students received no examiner feedback except on practice items.

Woodcock Reading Mastery Tests-Revised

The Woodcock Reading Mastery Tests-Revised (WRMT-R) (Woodcock, 1987) is an individually administered test used to assess development of readiness skills, basic reading skills, and reading comprehension skills.

The WRMT-R was standardized on 6,089 students in sixty geographically diverse communities. The internal-consistency reliability exceeds .90. The subtest of Passage comprehension has a test-retest reliability of .92.

The level of reading comprehension of the 120 students was determined by administering the Passage Comprehension subtest from the Woodcock Reading Mastery Tests-Revised (Woodcock, 1987), Form G. The procedure for the administration of this subtest was followed as directed in the test manual (p. 13). The student's task was to read silently a passage that has a word missing and then tell the researcher a word that could appropriately fill the blank space.

Data regarding listening comprehension ability was collected by administering the Passage Comprehension subtest from the Woodcock Reading Mastery Tests-Revised, Form H.

The researcher read the sentence to the students, who were asked to supply the missing word. The student was free to ask the researcher to repeat the sentence once. This test uses a modified close procedure. The passages are actual passages drawn from newspaper articles and textbooks. The researcher read the sentence to the student, who was then ask to supply the missing word. The student was free to ask the researcher to repeat the sentence once. Since the two forms of the subtest (Form G, which will be used as a reading comprehension test, and Form H, which will be used as a listening comprehension test) are compared for number of inferential questions, length, and difficulty level, both forms of the test

provided similar data; the only variation between them is the modality of presentation.

The test battery was individually administered. Raw scores were obtained for use in the data analysis as suggested in the test manual.

The WRMT-R has several useful applications relevant to this study. To assist in clinical assessment and diagnosis, the WRMT-R provides a comprehensive analysis of reading skills from which to proceed to other diagnostic procedures or instructional planning. The information gleaned from the tests can be used when developing a particular program, or to group students for instruction (Woodcock, 1987).

The Wechsler Individual Achievement Test

The Wechsler Individual Achievement Test (WIAT) (The Psychological Corporation, 1992) was selected because it is based on current research in reading. The WIAT is the only achievement battery directly linked with the Wechsler Scales. Educators have often stressed the importance of using co-normed or linked data from achievement and ability tests in diagnosing and assessing learning disabilities (Berk, 1984; Reynolds, 1990; Shepard, 1980). The WIAT covers the areas of learning disability specified in the Education for all Handicapped Children Act (Public Law 94-142; 1975).

Reliability information provided in the Wechsler Individual Achievement Tests (Psychological Corporation, 1992) included split-half reliabilities and test-retest alternative form reliabilities.

Reliability measures were reported for a sample of 367 children. The sample was drawn from five grades: Grades 1, 3, 5, 8, and 10. The Spearman-Brown split-half reliability for the Reading Comprehension test was .93 for the third grade sample and .91 for the fifth grade sample. The split-half reliability for the Listening Comprehension was .86 for the third grade and .88 for the fifth grade sample.

Construct-related evidence of validity is provided in a study by Roid, Twing, O'Brien, & Williams (1992). Correlation matrices to the multitrait-multimethod matrices recommended by Campbell and Fiske (1959) were constructed and correlations were calculated between normal-curve equivalent scores on the composites commonly found in achievement tests. The correlations among the scores on the basic reading and reading comprehension subtests consistently ranged from .79 to .84 across the groups, showing strong evidence of concurrent validity.

A wide range of curriculum objectives are contained in the WIAT subtests. The subtest of reading comprehension items tap several skills: recognizing stated detail, recognizing stated cause and effect, sequencing, recognizing implied cause and effect, and making inferences. The second subtest administered, listening comprehension, can supply rich information about the child's receptive language skills.

The WIAT subtest of reading comprehension is a series of printed passages and orally presented questions designed to measure skills such as recognizing stated detail and making inferences.

Passages consist of one or more sentences, some with accompanying pictures. The student will respond orally.

Listening comprehension, another subtest of the WIAT, is a series of items for measuring listening comprehension skills such as listening for detail. The student must identify the picture that corresponds to an orally presented word or passage. During the early items the student responds by pointing to a picture. For later items the student is to respond orally. The reliabilities for each of the test are found in Table II.

Procedures

Initially, the superintendent for each of the participating school districts was contacted and permission for their school district's participation in the study was obtained. Parental permission was obtained for student testing. Information concerning the purpose of the study project, tests to be administered, time required, and confidentiality was provided to parents of participating students.

Subjects were tested individually in a single session that averaged between one and a half to two hours. All students were assessed in a small office where visual and auditory distractions were minimized. After original rapport was established, typically on the way to the testing room, the examiner confirmed that the subject knew the purpose of the testing session. The student was told of the researcher's interest in learning more about reading both from students who had some difficulty and from those who had no

TABLE II

RELIABILITIES FOR TESTS

Test	r	Method	Source
PIAT-R	.97	Split-half	Markwardt (1989)
WRMT-R	.96	Split-half	Woodcock (1987)
WIAT	.95	Split-half	The Psychological Corporation (1992)

difficulty with reading. The overall format of the testing period was explained as was test content. The students were assured that no grades or any other type of educational repercussion would result from their performance--they were selected to help the researcher.

Prior to specific instructions to each test being given, the overall nature of the task was explained to each student.

Data Analysis

The section on data analysis includes scoring procedures and statistical analyses used in the WRMT-R, PIAT-R and WIAT Reading and Listening comprehension subtests. The t-test (Norusis, 1990) is a test applicable when comparing group mean scores. Reading and listening comprehension mean scores for students with and without RD will be used to compare group-by-modality interaction. These data will be analyzed with two-tailed t tests. The examiner will also examine group differences between reading and listening scores.

Correlations between listening comprehension and reading comprehension discrepancy scores as measured by appropriate WIAT, WRMT-R and PIAT subtests will be computed.

This correlation may suggest that RD students with low reading comprehension scores can be distinguished from nondisabled children with average reading scores by their reading and listening discrepancy scores as measured by the modified WRMT-R, PIAT and the WIAT listening and reading comprehension subtests. None of these subtests have been used in combination before. The statistical analysis may suggest not only subtests relationships but may suggest

their utility in determining the reading abilities of both reading disabled and nondisabled reader students.

Figures I, II, and III are a graphic representation of the mean comprehension scores of subjects with and without reading disabilities under reading and listening conditions on the PIAT-R, WRMT-R, and WIAT. These figures are found in Appendix B, C, and D.

Chapter IV deals with the results of the data collection as it relates to each hypothesis of this study. The statistical significance of the analyzed data will be discussed. This analysis was conduced using two-tailed t tests and a correlational matrix.

CHAPTER IV

ANALYSIS OF DATA

The purpose of this chapter is to present the statistical analysis utilized to test the hypotheses in this study. The primary goal of this study was to determine if children with reading disabilities could be identified from a discrepancy between their reading and listening comprehension subtests scores. A second goal was to determine if there was any significant difference between the reading disabled and the non-reading disabled groups in their reading and listening comprehension subtests skills. A third goal was to examine the relationship of the reading tests administered in this study to determine any significant correlation between tests. A strong relationship among reading tests was anticipated.

The results of the statistical treatment of data with respect to each of the study hypothesis are presented in this chapter. Analyses first address the description of groups. A discussion next specifies the different tasks which measure reading and listening comprehension. Then the hypotheses are stated and the analysis presented. Lastly, the summary of results finalizes this chapter.

According to Ary, Jacobs, and Razavieh (1979), the ". . . most commonly used levels of significance in the field of education are the .05 and .01 levels" (p. 144). Since this study involves several independent analyses on the same data, statistical significance has

been set at the .01 level to minimize error. While not considered statistically significant under the procedures of this study, a probability level < .05 will be viewed as warranting further investigation.

Definition of Groups

The reading status classification for the study participants was determined by a student's prior identification as experiencing a learning disability in the area of reading by the local system. The reading status of the second group of study participants was determined by the composite reading score on the Iowa Test of Basic Skills.

Reading Tasks

Reading skills are measured by different tasks such as the ability to read a passage or to listen as a passage is being read and then respond appropriately. In this study these tasks were measured by the following standardized tests. The Peabody Individual Achievement Test-Revised (PIAT-R), (Markwardt, 1989) measured the students ability to read and listen to a sentence, then point to a picture that best illustrates the event described in the sentence. The Woodcock Reading Mastery Test-Revised (WRMT-R), (Woodcock, 1987) Form G measures the reading comprehension of the student on a modified cloze procedure. Form H is used to verify the listening comprehension of the student. The Wechsler Individual Achievement Test (WIAT) (The Psychological Corporation, 1992) was

selected because it is based on current reading research. The student reads a passage and then answers questions about the content of the passage read. To measure listening comprehension the students listens as the examiner reads a passage and then answers questions about the passage.

Group means and standard deviations for the Grade 3 and Grade 5 reading disabled and nondisabled reader groups on reading and listening comprehension measures appear in Table III and Table IV.

Hypothesis 1: There will be a significant difference between the mean Reading Comprehension and Listening Comprehension scores of the disabled readers and nondisabled readers on the Reading Comprehension subtest of the Peabody Individual Achievement Test-Revised (PIAT-R) (Markwardt, 1989).

Hypothesis 1 was tested by the use of t-test analysis (Norusis, 1990). The group means and results of these analyses appear in Tables V and VI.

On the Peabody Individual Achievement Test-Revised (PIAT-R) for Grade 3 reading disabled and Grade 3 nondisabled reading groups, the comprehension scores were compared with two-tailed t-tests. The reading comprehension scores of the group with RD were significantly lower than those of the nondisabled group, $t(58) = -.9.33$, $p < .01$. Listening comprehension scores of the group with RD, were also significantly lower than those of the nondisabled group, $t(58) = -4.31$, $p < .01$.

The Grade 5 reading disabled and Grade 5 nondisabled reader groups comprehension scores were compared using two-tailed t-test.

TABLE III

COMPARING DISABLED READER AND NONDISABLED READER STUDENTS ON READING TESTS GRADE THREE

Grade Level Means, Standard Deviations, and Cases	Third Grade RD (N=30)			Third Grade NRD (N=30)		
Variables	Mean	SD	N	Mean	SD	N
PIAT-R.C.	11.83	3.90	30	22.03	4.54	30
PIAT-R L.C.	18.50	4.11	30	22.83	3.67	30
WRMT-R.C.	23.83	5.66	30	37.47	5.02	30
WRMT-R L.C.	32.90	4.11	30	36.57	6.64	30
WIAT R.C.	12.13	2.39	30	22.97	6.09	30
WIAT L.C.	24.07	3.15	30	24.63	4.58	30

PIAT-R.C. - Peabody Individual Achievement Test-Revised (Dunn & Markwardt, 1987) (Reading Comprehension subtest)
PIAT-R L.C. - Peabody Individual Achievement Test-Revised(Dunn & Markwardt, 1987) (Listening Comprehension subtest)
WRMT-R.C. - Woodcock Reading Mastery Test-Revised (Woodcock,1987) (Reading Comprehension subtest)
WRMT-R L.C. - Woodcock Reading Mastery Test-Revised (Woodcock, 1987) (Listening Comprehension subtest)
WIAT - Wechsler Individual Achievement Test (Psychological Corporation, 1992) (Reading Comprehension subtest)
WIAT - Wechsler Individual Achievement Test (Psychological Corporation, 1992) (Listening Comprehension subtest)

TABLE IV

COMPARING READING DISABLED AND NONDISABLED READING STUDENTS ON READING TESTS GRADE FIVE

Grade Level Means, Standard Deviations, and Cases	Fifth Grade LD (N=30)			Fifth Grade NRD (N=30)		
Variables	Mean	SD	N	Mean	SD	N
PIAT-R.C.	19.10	4.46	30	31.63	3.84	30
PIAT-R L.C.	23.10	5.11	30	31.07	3.49	30
WRMT-R.C.	33.10	4.33	30	44.80	6.59	30
WRMT-R L.C.	36.30	5.19	30	43.50	6.45	30
WIAT R.C.	17.70	3.73	30	30.30	3.45	30
WIAT L.C.	24.07	2.74	30	27.67	2.25	30

PIAT-R.C. - Peabody Individual Achievement Test-Revised (Dunn & Markwardt, 1989) (Reading Comprehension subtest)
PIAT-R L.C. - Peabody Individual Achievement Test-Revised (Dunn & Markwardt, 1989 (Listening Comprehension subtest)
WRMT-R - Woodcock Reading Mastery Test-Revised (Woodcock, 1987) (Reading Comprehension subtest)
WRMT-R - Woodcock Reading Mastery Test-Revised (Woodcock, 1987) (Listening Comprehension subtest)
WIAT - Wechsler Individual Achievement Test (Psychological Corporation, 1992) (Reading Comprehension subtest)
WIAT - Wechsler Individual Achievement Test (Psychological Corporation, 1992) (Listening Comprehension subtest)

TABLE V

COMPARISON OF MEAN READING COMPREHENSION AND LISTENING COMPREHENSION SCORES BETWEEN READING DISABLED AND NONDISABLED READERS GRADE THREE

Reading Measure	Grade 3 Reading Disabled	Grade 3 Nondisabled Readers	df	t	p
		Individual Reading Subtest Scores			
PIAT-R	R.C.	11.83 N=30	22.03 N=30	58	-9.33	.000
PIAT-R	L.C.	18.50 N=30	22.83 N=30	58	-4.31	.000

Statistical significance based on the criterion of $p < .01$

TABLE VI

COMPARISON OF MEAN READING COMPREHENSION AND LISTENING COMPREHENSION SCORES BETWEEN READING DISABLED AND NONDISABLED READERS GRADE FIVE

Reading Measure	Grade 5 Reading Disabled	Grade 5 Nondisabled Disabled	df	t	p
		Individual Reading Subtest Scores			
PIAT-R	R.C.	19.10 N=30	31.63 N=30	58	-11.67	.000
PIAT-R	L.C.	23.10 N=30	31.07 N=30	58	-7.04	.000

Statistical significance based on the criterion of $p < .01$

The reading comprehension scores of the group with RD were significantly lower than those of the nondisabled group, $t(58) = -.11.67$, $p < .01$. The listening comprehension scores of this same group of students indicated a significantly lower score for the reading disabled than for the nondisabled reader, $t(58) = -7.04 < .01$.

The original PIAT-R Reading Comprehension test covered a reading ability range from 1.9 grade equivalency to 12.8 grade equivalency. The original test, included 82 items and was divided into a reading test of even-numbered items and a listening test of odd-numbered items. The mean reading comprehension score of the nondisabled group was only about half of the maximum possible score of 41 points. Comparably, the mean listening comprehension scores of the nondisabled and disabled groups were somewhat similar. Additionally, the highest reading comprehension score of any Grade 3 subject, reading disabled or nondisabled reader was 29 points, and the highest listening score for the third grade subjects, reading disabled or nondisabled reader, was 32 points.

The highest reading comprehension score of any fifth grade subject, reading disabled or nondisabled reader was 38 points out of a possible 41 points. These data demonstrate that no subject, either reading disabled or nondisabled reader, was capable of responding correctly to all items on the listening comprehension subtest.

The degree to which students with and without RD were discriminated by differences between their reading and listening

scores was also examined. Reading comprehension scores were subtracted from listening comprehension scores for each student, and the mean discrepancy scores of the two groups were compared. The mean reading-listening discrepancy score for the Grade 3 group with RD was 6.67 (SD=4.15). For the nondisabled Grade 3 students, the mean reading-listening discrepancy score was .80 (SD=3.56). The difference between the discrepancy scores of the two groups was significant, $t(58)= 5.88$, $p < .01$.

The discrimination between the mean reading comprehension and mean listening comprehension scores for the Grade 5 subjects was also examined. The reading comprehension scores were subtracted from the listening comprehension scores for each group and the mean score for the groups was compared. The mean reading-listening discrepancy score for the RD group was 4.0 (SD=.551). The mean reading-listening discrepancy score for the nondisabled reader students was -.5667 (SD=1.960). The difference between the two groups was significant, $t(58)= 6.95$, $< .01$.

Hypothesis 2: There will be a significant difference between the mean Reading Comprehension and Listening Comprehension scores of the disabled readers and nondisabled readers on the Reading Passage Comprehension Form G and Form H of the Woodcock Reading Mastery Test-Revised (WRMT-R) (Woodcock, 1987)

Hypothesis 2 was tested by the use of t-test analysis. Relevant group means and results of these investigations appear in Tables VII and VIII.

TABLE VII

COMPARISON OF MEAN READING COMPREHENSION AND LISTENING COMPREHENSION SCORES BETWEEN READING DISABLED AND NONDISABLED READERS GRADE THREE

Reading Measure Disabled	Grade 3 Reading Reader	Grade 3 Nondisabled	df	t	p
		Individual Reading Subtest Scores			
WRMT-R	R.C.	23.83 N=30	37.47 N=30	58	-98.7	.000
WRMT-R	L.C.	32.90 N=30	36.57 N=30	58	-2.	.013

Statistical significance based on the criterion of $p < .01$

TABLE VIII

COMPARISON OF MEAN READING COMPREHENSION AND LISTENING COMPREHENSION SCORES BETWEEN READING DISABLED AND NONDISABLED READERS GRADE FIVE

Reading Measure Disabled	Grade 5 Reading Reader	Grade 5 Nondisabled	df	t	p
		Individual Reading Subtest Scores			
WRMT-R	R.C.	33.10 N=30	44.80 N=30	58	-8.13	.000
WRMT-R	L.C.	36.30 N=30	43.50 N=30	58	-4.76	.000

Statistical significance based on the criterion of $p < .01$

The mean scores for reading comprehension of the 60 Grade 3 reading disabled and Grade 3 nondisabled reader study groups were administered the Woodcock Reading Mastery Test-Revised (WRMT-R) Passage Comprehension subtest, Form G. and Form H. On the WRMT-R, the reading comprehension and listening comprehension scores were compared with two-tailed t-tests. The mean reading comprehension scores of the group with RD was significantly lower than those of the nondisabled group, $t(58) = -9.87$, < p.01. Listening comprehension scores of the group with RD were also significantly lower than those of the nondisabled group $t(58)= -2.57$, $p < .01$.

The Grade 5 reading disabled and Grade 5 non-reading disabled study groups comprehension scores on the WRMT-R were compared using two-tailed t-test. The reading comprehension scores of the group with RD were significantly lower than those of the nondisabled group, $t(58) = -8.13$, $p < .01$. The listening comprehension scores of this same group of students indicated a significantly lower score for the reading disabled than for the nondisabled reader, $t(58) = -4.76$, $p < 01$.

The Woodcock Reading Mastery Test covered a reading ability range from Grade Equivalency K.0 to Grade Equivalency 16.9. The original test included 68 items. The mean reading comprehension score of the nondisabled group was only about half of the maximum possible score of 68 points. Comparably, the mean listening comprehension scores of the nondisabled and disabled groups were somewhat higher.

Additionally, the highest reading comprehension score of any third grade subject, reading disabled or nondisabled reader, was 37 out of a possible 68 points, and the highest listening scores for the third grade subjects, reading disabled or nondisabled reader, was 36 out of a possible 68 points. The highest reading comprehension score of any fifth grade subject, reading disabled or nondisabled reader was a total of 45 out of a possible 68 points. Neither the disabled nor the nondisabled subjects were able to score all 68 points on the listening comprehension subtest. The highest score for the subject was 43 points out of 68 points. These data demonstrate that no subject was capable of responding correctly to all items on either the reading subtest or the listening subtest.

The degree to which students with and without RD were discriminated by differences between their reading and listening scores was also examined. Reading comprehension scores were subtracted from listening comprehension scores for each student, and the mean discrepancy scores of the two groups was compared. The mean reading-listening discrepancy score for the Grade 3 group with RD was 9.06 (SD=6.02). The mean reading-listening discrepancy score for the Grade 3 nondisabled reader students was -.90 (SD=6.32). The difference between the discrepancy scores of the two groups was significant, $t(58)= 6.25$, $p < .01$.

The discrimination between the mean reading comprehension and listening comprehension scores for the Grade 5 subjects was also examined. The reading scores were subtracted from the listening comprehension scores for each group and the mean score for the

groups was compared. The mean reading-listening discrepancy score for the RD group was 3.2 (SD=5.48). The mean reading-listening discrepancy score for the nondisabled reader students was -1.30 (SD=7.98). The difference between the two groups was significant, $t(58) = 2.54$, $p < .01$.

Hypothesis 3: There will be a significant difference between the mean Reading Comprehension and Listening Comprehension scores of the disabled readers and nondisabled readers on the Reading and Listening Comprehension subtests of the Wechsler Individual Achievement Test (WIAT) (The Psychological Corporation, 1992)

Hypothesis 3 was tested with a t-test analysis. Applicable group means and results of these investigations appear in Table IX and X.

On the Wechsler Individual Achievement Test (WIAT) for grade 3 reading disabled and Grade 3 nondisabled reader groups, the reading and listening comprehension scores were compared with two-tailed t-tests. The reading comprehension scores of the group with RD were significantly lower than the reading comprehension scores of the nondisabled reader group, $t(58) = -9.07$, $p < .01$. Listening comprehension scores of the group with RD, were also significantly lower than those of the nondisabled group $t(58) = -.56$, $p < .01$.

The grade 5 reading disabled and Grade 5 nondisabled reader groups comprehension scores on the WIAT were compared using two-tailed t-test. The reading comprehension scores of the group with RD were significantly lower than those of the nondisabled group, $t(58) = -.13.58$, $p < .01$. Listening comprehension scores of the

TABLE IX

COMPARISON OF MEAN READING COMPREHENSION AND LISTENING COMPREHENSION SCORES BETWEEN READING DISABLED AND NONDISABLED READERS GRADE THREE

Reading Measure Disabled	Grade 3 Reading Reader	Grade 3 Nondisabled	df	t	p
		Individual Reading Subtest Scores			
WIAT	R.C.	12.13 N=30	22.97 N=30	58	-9.07	.000
WIAT	L.C.	24.07 N=30	24.63 N=30	58	- .56	.597

Statistical significance based on the criterion of $p < .01$

TABLE X

COMPARISON OF MEAN READING COMPREHENSION AND LISTENING COMPREHENSION SCORES BETWEEN READING DISABLED AND NONDISABLED READERS GRADE FIVE

Reading Measure	Grade 5 Reading Disabled	Grade 5 Nondisabled Reader		df	t	p
		Individual Reading Subtest Scores				
WIAT	R.C.	17.17 N=30	30.30 N=30	58	-13.58	.000
WIAT	L.C.	24.07 N=30	27.67 N=30	58	-5.56	.000

Statistical significance based on the criterion of $p < .01$

group with RD were not significantly lower than those of the nondisabled group $t(58) = -5.56$, $p < .01$.

The Wechsler Individual Achievement Test covered a reading ability range from Grade Equivalency K.0 to Grade Equivalency 16.9. The Reading Comprehension subtest included 38 items. The mean reading comprehension score of the Grade 3 nondisabled group was only about half of the maximum possible score of 38 points. Comparably, the mean listening comprehension scores of the nondisabled and disabled groups were somewhat higher. Additionally, the highest reading comprehension score of any third grade subject, reading disabled or nondisabled reader, was 34 points. Comparably, the mean listening comprehension scores of the nondisabled and disabled groups were somewhat higher.

Additionally, the highest reading comprehension score of any third grade subject, reading disabled or nondisabled reader, was 34 out a possible 36 points.

The highest reading comprehension score of any fifth grade subject, reading disabled or nondisabled reader was a total of 33 out of 38 points. Neither the disabled nor the nondisabled subjects were able to score all 36 points on the reading comprehension subtest. The highest score for the subjects was 31 out of a possible 36 points. These data demonstrate that no subject was capable of responding correctly to all items on the listening comprehension subtest.

The degree to which students with and without RD were discriminated by differences between their reading and listening

scores was also examined. Reading comprehension scores were subtracted from listening comprehension scores for each student, and the mean discrepancy scores of the two groups was compared. The mean reading-listening discrepancy score for the Grade 3 group with RD was 11.9 (SD=3.69). The mean reading-listening discrepancy score for the Grade 3 nondisabled reader students was 1.67 (SD=4.27). The difference between the discrepancy scores of the two groups was significant, $t(58) = 9.95$, $p < .01$.

The discrimination between the mean reading comprehension and listening comprehension scores for the Grade 5 subjects was also examined. The reading scores were subtracted from the listening comprehension scores for each group and the mean score for the groups was compared. The mean reading-listening discrepancy score for the RD group was 6.37 (SD=4.82). The mean reading-listening discrepancy score for the Grade 5 nondisabled reader students was -2.63 (SD=4.18). The difference between the two groups was significant, $t(58) = 7.72$, $p < .01$.

It was originally hypothesized that certain of these tests would show a strong relationship to one another due to similarity of reading tasks. In Table XI the correlations on reading and listening comprehension scores among the three types of tests are shown.

Hypothesis 4: There will be a statistically significant relationship between the Reading Comprehension and Listening Comprehension subtests of the modified Peabody Individual Achievement Test-Revised (PIAT-R) (Markwardt, 1989) and the Reading

TABLE XI

COEFFICIENT OF CORRELATION OF TESTS

	PRC	WORC	WERC
PRC	1.000	.8307	.8345
WORC	.8307	1.000	.7664
WERC	.8345	.7664	1.000
	PLC	**WOLC**	**WELC**
PLC	1.000	.5729	.4554
WOLC	.5729	1.000	.2416
WELC	.4554	.2416	1.000
	P DIFF	**WO DIFF**	**WE DIFF**
P DIFF	1.000	.4086	.6115
WO DIFF	.4086	1.000	.4128
WE DIFF	.6115	.4128	1.000

Note: PRC - Peabody Individual Achievement Test-R (Dunn & Markwardt, 1989) (Reading Comprehension subtests)
WORC - Woodcock Reading Mastery Test-Revised (Woodcock, 1987) (Reading Comprehension subtests)
WERC - Wechsler Individual Achievement Test (Psychological Corporation, 1992) (Reading Comprehension subtests)
PLC - Peabody Individual Achievement-R (Dunn & Markwardt, 1989) (Listening Comprehension subtests)
WOLC - Woodcock Reading Mastery Test-Revised (Woodcock, 1987) (Listening Comprehension subtests)
WELC - Wechsler Individual Achievement Test (Psychological Corporation, 1992) (Listening Comprehension subtests)
P Diff - Peabody Individual Achievement Test-R (Dunn & Markwardt, 1989) (Reading and Listening Comprehension subtests differences)
WO Diff - Woodcock Reading Master Test-Revised (Woodcock, 1987) (Reading and Listening Comprehension subtests differences)
WE Diff - Wechsler Individual Achievement Test (Psychological Corporation, 1992) (Reading and Listening Comprehension subtests differences)

Comprehension and Listening Comprehension subtests on the modified Woodcock Reading Mastery Test-Revised (WRMT-R)(Woodcock 1987) Form G and Form H.

According to the PIAT-R and the WRMT-R analysis of data there was a significant relationship at the .001 level. The hypothesis stated there will be a significant relationship between the Reading Comprehension subtests of the PIAT-R and WRMT-R as well as a significant relationship between the Listening Comprehension subtests of the PIAT-R and WRMT-R. These findings are in agreement with the studies of Aaron (1991) and Spring and French (1990).

Hypothesis 5: There will be a statistically significant relationship between the Reading Comprehension and Listening Comprehension subtests of the modified Peabody Individual Achievement Test-Revised (PIAT-R) (Markwardt, 1989) and the Reading Comprehension and Listening Comprehension subtests of the Wechsler Individual Achievement Test (WAIT) (The Psychological Corporation, 1992).

According to the WRMT-R and the WIAT analyze of the Reading Comprehension and Listening Comprehension subtests data there was a significant relationship at the .001 level. This data supported the hypothesis which stated there would be a significant relationship between the WRMT-R and WIAT Reading Comprehension and Listening Comprehension subtests.

Hypothesis 6: There will a statistically significant relationship between the Reading Comprehension and Listening Comprehension subtests on the modified Woodcock Reading Mastery

Test-Revised (WRMT-R) (Woodcock, 1987) Form G and Form H and the Reading Comprehension and Listening Comprehension subtests of the Wechsler Individual Achievement Test (WIAT) (The Psychological Corporation, 1992).

According to the WRMT-R and the WIAT reading subtests data analysis, there was a significant relationship at the .001 level. As the hypothesis stated there will be a significant relationship between the Reading Comprehension and Listening Comprehension subtests of the WRMT-R and WIAT.

The data suggest a significant relationship between the Reading Comprehension and Listening Comprehension subtests of the WRMT-R and the WIAT. The data supports the acceptance of the hypothesis. As stated in Chapter II, Aaron (1991) did a study utilizing the WRMT-R in a similar manner, however, the WIAT has not been used in this manner prior to this study. The findings from this initial investigation support the results of the other hypothesis.

Summary

The objective of this chapter was to present the statistical analysis and interpretation of the data generated by this study. An examination of grade level interactions with the various variables revealed significant relationships. Therefore, the effectiveness with which students with and without RD were discriminated by differences between their reading and listening scores was also examined.

Secondly, it was hypothesized that, even though reading comprehension scores of children with reading disabilities would be significantly lower than those of nondisabled students who were average readers, their listening comprehension scores would not differ greatly from those of nondisabled children. This hypothesis was supported by a significant interaction. It was evidenced that reading and listening scores of nondisabled readers did not vary significantly, and that reading scores were significantly lower than listening scores in the reading disabled students.

The analysis of data also indicates that the discrepancy between reading and listening comprehension scores significantly discriminate disabled readers from nondisabled readers.

The t-test used to determine the intensity of association between reading tests provided adequate support for the hypotheses in Chapter I that a discrepancy between reading and listening comprehension scores can identify reading disabled students.

The Peabody Achievement Test-Revised and the Woodcock Reading Mastery Test-Revised have been widely used elsewhere. However the Wechsler Individual Achievement Test has not been used in this manner due to its publication in 1992. Albeit, these tests have not been used in this combination for the task of identifying the reading disabled student.

Chapter V will include an overall summary of findings, literature review, conclusions, and recommendations.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The catalyst for this study came from the criticisms directed at the current identification systems used in special education. In Chapter II, several issues were reviewed concerning problems with current referral practices, assessment procedures for placement in special education programs for the reading disabled.

This study has a number of implications related to the criticisms leveled at the current identification system. Regarding current referral practices, a major concern is the lack of a requirement that a carefully planned intervention to maintain a student in general education be executed and documented (Gartner, 1986). The assessment procedure used in this study could provide data helpful in constructing such a planned intervention. While the assessment results do not indicate preferences for particular instructional strategies or programs, a student's relative strengths and weaknesses could be defined from such a battery.

Present assessment practices have been examined for their failure to lead to particular instructional interventions (Batsche, 1984; Galagan, 1985; Reschley, 1988). The assessment procedure used in this study has direct implications for constructing and designing interventions in the area of reading. Designing a program based on

the information provided from a battery of tests specifically designed to assess reading skills is of benefit to the classroom teacher.

Aaron and others (Aaron, 1991; Spring & French, 1990; Ysseldyke, 1987; Ysseldyke & Algozzine, 1982; Ysseldyke, Algozzine, Richey, & Graden, 1982; Ysseldyke, Algozzine, Shinn, & McGue, 1982) are major critics of the current classification system. Ysseldyke (1987) proposed that (1) there is currently no defensible psychometric methodology for reliably differentiating students into categories, (2) there is no evidence to support the contention that specific categories of students learn differently, and (3) categorically grouped students do not demonstrate a set of universal and specific characteristics. This study would support those criticisms. When reading evaluations are used, the LD populations exhibit different instructional needs than do the Non-LD populations. The findings of this study would also lend support to Ysseldyke's et al. (1982) contention that suggest that the current LD diagnosis is primarily based upon academic functions and that LD children may underachieve for other reasons. Consequently, the use of the current LD criteria has opened the door for significant false positive diagnosis of LD children and a rapid growth of the LD population. Adelman (1989) advises that these evaluation models have led to LD clustering which are heterogeneous. Adelman (1989) also believes that the failure to identify the causes of academic underachievement in the LD population has caused the field's

fundamental research methodology and intervention efforts to fall short of expectations.

The confines characterized above, as well as legal injunctions that prohibit the use of IQ scores in some instances, have encouraged researchers to explore alternative criteria and procedures that could be based on the components that make up the academic skill under investigation. Thus, this study utilizes a form of academic assessment of the reading process.

Discussion and Summary of Findings

The purpose of this study was to investigate a potential screening procedure for identifying children with a reading disability. That is, the method is based on the detection of a discrepancy between listening and reading comprehension scores as an alternative to the traditional method of identification which is based on a discrepancy between intelligence and reading. It was hypothesized that the discrepancy between reading and listening comprehension scores would significantly discriminate disabled from nondisabled readers.

A total of 120 students (30 Grade 3 reading disabled, 30 Grade 3 nondisabled reader, 30 Grade 5 reading disabled, and 30 Grade 5 nondisabled reader) participated in the study. The following measures were administered:

1. The Peabody Individual Achievement Test-Revised (PIAT-R). This test was divided into two versions.

2. The Woodcock Reading Mastery Test-Revised (WRMT-R), Form G was used for reading comprehension and Form H was used for listening comprehension.

3. The Wechsler Individual Achievement Test (WIAT) Reading and listening comprehension subtest.

Data analyses utilized the two-tailed t-test of differences of means. Statistical treatment of data relevant to the primary hypotheses concerning the discrepancy between reading and listening comprehension revealed the following:

The difference between group mean scores on the Peabody Individual Achievement Test-Revised (PIAT-R), Woodcock Reading Mastery Test-Revised (WRMT-R) and the Wechsler Individual Achievement Test (WIAT) for Grade 3 and Grade 5 reading disabled and nondisabled reader students were statistically significant (criterion of $p < .01$). This significance held true for the reading comprehension as well as the listening comprehension mean scores. These findings provide support for the relationships between reading comprehension and listening comprehension discussed in Chapter II (Aaron & Joshi, 1992; Aaron, 1991; Spring & French, 1990; Shinn, 1989, Reschly, 1988).

Analyses of the group differences between reading and listening scores was examined. For the nondisabled group, listening scores were higher than the reading scores. This difference was not significant. For the reading disabled, the difference in reading and listening scores was significant. The reading disabled group had significantly lower reading scores than listening scores.

This study looked at reading and listening discrepancy scores which proved to be effective in discriminating children with reading disabilities from children whose reading abilities were average. Therefore, by administering the PIAT-R, WRMT-R, and the WIAT, the subjects with reading disabilities were identified without giving an intelligence test. This data did prove to be appropriate and significant for the purposes of this study.

It was expected that the students with a reading disability would score lower on reading comprehension than those students that were nondisabled reader. This proved to be true by the comparison with two-tailed t tests. The reading comprehension scores of the group with RD were significantly lower than those of the nondisabled group as measured on the PIAT, WRMT-R and the WIAT.

Researchers have found lower listening comprehension scores for disabled readers than nondisabled readers under certain conditions. Shankweiler and Crain (1986), suggested that the problem may be largely due to the inadequate or limited working memories of disabled readers.

If normative data were available for the modified PIAT-R, the WRMT-R and the WIAT, then the present method of identifying reading disability would have several advantages over the traditional method, which is based on the detection of a discrepancy between reading and intelligence. The proposal of a discrepancy between reading and listening comprehension could be understood by parents and laypersons. Also, the observance of a discrepancy could suggest a remedial strategy. Additionally, this method might be utilized in

school districts that do not now permit the traditional method.

Limitations of this Study and Suggestions for Future Research

This effort to investigate a reading disability screening procedure, based on a discrepancy between reading comprehension and listening comprehension scores represents an initial step toward identifying these children in such a way that there are direct implications for instructional interventions. Additional research is needed to decide whether these results will be replicated using other samples of students classified as reading disabled and nondisabled reader. While this study might be somewhat restricted, the outcomes warrant additional investigation into ways students in various categories of exceptionality might be grouped for instructional purposes.

The results of any study of this type are contingent upon the variables designated for inclusion in the study, the screening instruments selected to measure those variables, and the statistical method used to determine the discrepancies. Whereas every effort was made to insure that the variables examined and the screening instruments chosen to measure them were compatible with the current research in reading, it is recognized that the selection of measures ultimately decides the quality of the discrepancy scores. This was a theory upon which the screening instruments in this study were

chosen. It is recognized that the use of other instruments would possibly result in different scores.

The statistical analyses applied to the data was two-tailed *t* tests to explore the group-by-modality interaction of the compression scores of the students with and without RD and a Pearson Correlation Matrix used to look at the interaction of the various screening instruments.

The data selected for inclusion in the analysis were contingent upon a sampling of reading behavior at a given point in time. It is uncertain how characteristic of the students' daily performance the results of the assessment procedure were. Subsequent research in this area is suggested. This study does not take into consideration the students' rates of learning. Rate of learning would be a notable variable to consider in future studies since it would be preferred for the grouping to have permanence over some length of time.

This procedure does not take into account the students' prior reading experience or instruction. This could be a difficult area to determine as the researcher cannot be positive that the materials listed in a student's files, if any, were in fact used in the classroom. Also, data would need to be collected in regard to the instructional procedures used by the classroom teachers. It is vital information, however, because a student who experiences problems in a particular reading skill after some method of instruction intended to foster that skill might demonstrate a different problem than the student with no previous experience in

that area. It is infeasible at this point to conclude whether the achievement on the various reading measures by a specific student is the product of the student's inherent reading style or the result of educational experience and instruction.

It would be valuable for a processing based reading disability screening battery to include tasks which measure simultaneous and successive processing skills gathered through visual and auditory channels.

Finally, although the results of this study help define characteristics of reading and listening comprehension for reading disabled and nondisabled reader students, decisions still have to be made regarding specific instructional strategies and programs. Additional research is needed to determine what specific instructional interventions prove most effective with the reading disabled student.

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APPENDIXES

APPENDIX A

INFORMED CONSENT FORM

OSU

Oklahoma State University

DEPARTMENT OF CURRICULUM AND INSTRUCTION
COLLEGE OF EDUCATION

STILLWATER, OKLAHOMA 74078-0146
GUNDERSEN HALL 302
(405) 744-7125

Dear Parent,

In cooperation with Oklahoma State University, your school district and your child's principal, I have been granted permission to gather information for my doctoral research in your elementary school. Research in the last several years suggests that listening and reading comprehension are correlated and may have an influence on reading disabilities. I am interested in learning more about this relationship.

For such studies, information is needed from children who are reading on or above grade level experiencing academic difficulties. After consulting with school personnel, your child was suggested to me as a possible subject due to his/her reading level. The children participating in the study will be asked to do a battery of reading tests.

The entire procedure should take approximately 1 - $1^1/2$ hours and would be conducted in the school during regular hours.

Information gathered from the testing will be confidential and shared only with the appropriate school personnel. Upon completion of my research, audiotapes and other materials will be destroyed. Would you kindly indicate your interest in allowing your child to participate, whether positive or negative, and return the consent form? I sincerely thank you for your assistance in my research and am available (wk. 581-2315; hm. 355-7849) for any questions you may have.

Sincerely,

Jackie Wood

Jackie Wood

_____ Permission is granted

_____ Permission is not granted

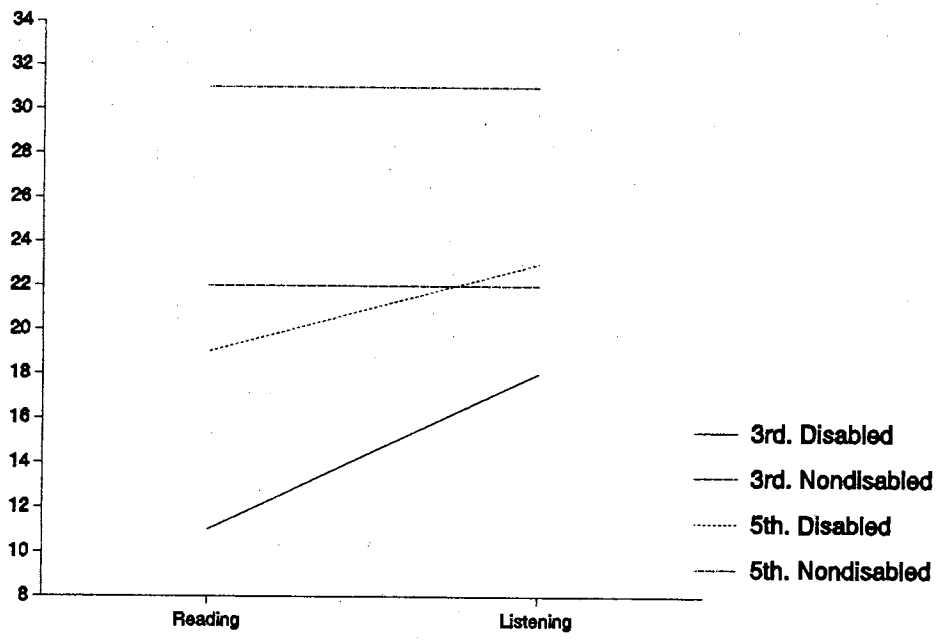
for my child, _____ to participate in the requested activity. I understand that the purpose of this procedure is to collect information on reading and listening comprehension and that no benefits can be promised to my child or myself other than the benefit of having contributed to the study of children with reading difficulties.

In addition, I am free to withdraw my consent with assurance that no negative consequence shall be directed toward my child. Further information regarding my child's rights as a subject may be gained from the Oklahoma State University Institutional Review Board (405-744-5700).

Parent: _____ Date: _____

APPENDIX B

PEABODY INDIVIDUAL ACHIEVEMENT TEST-REVISED

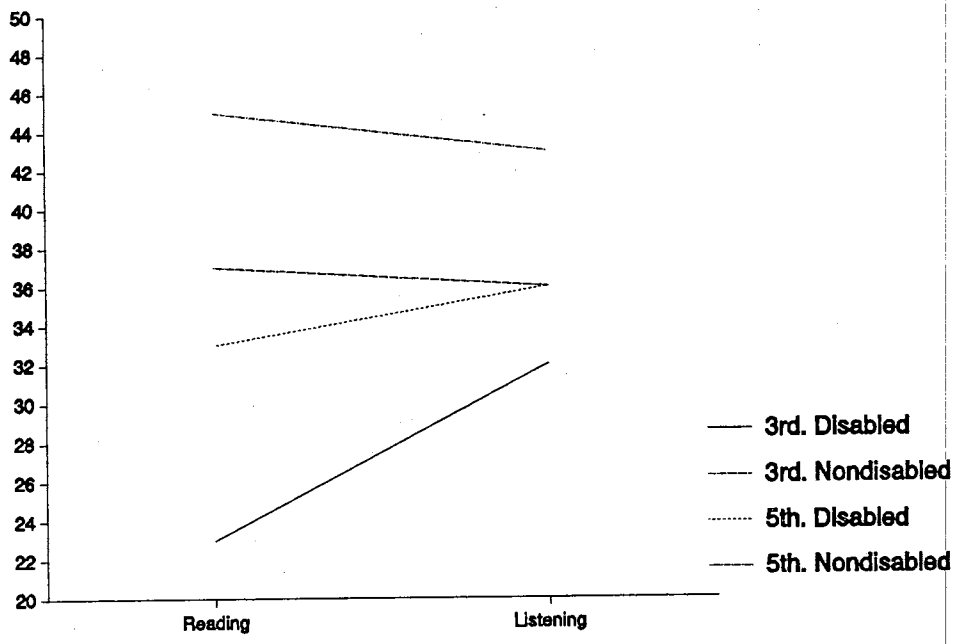


Mean comprehension scores of subjects with and without reading disabilities under reading and listening conditions.

Figure 1. Mean Comprehension Scores PIAT-R

APPENDIX C

WOODCOCK READING MASTERY TEST-REVISED

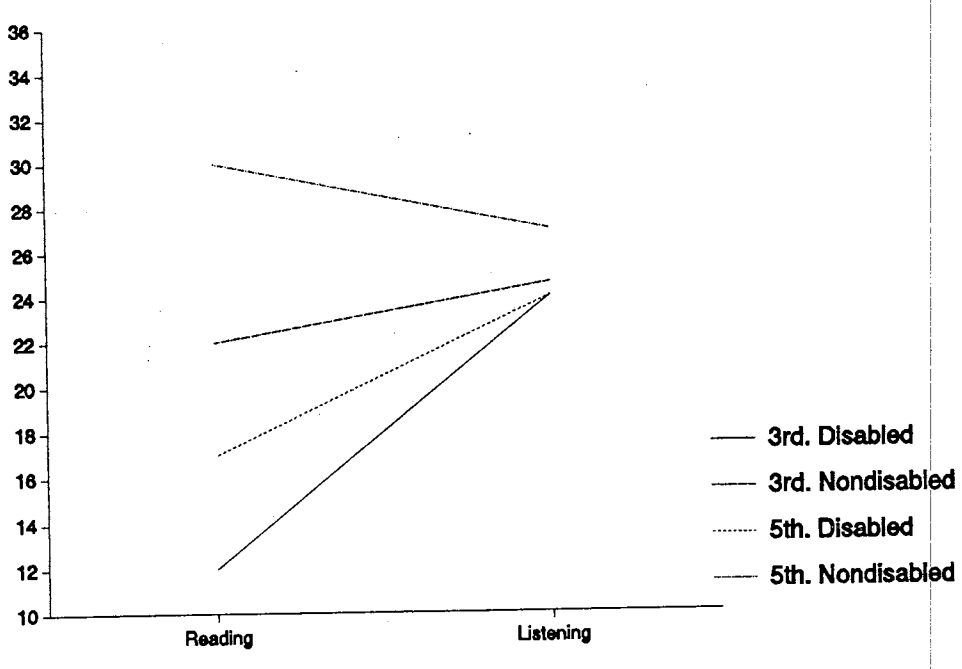


Mean comprehension scores of subjects with and without reading disabilities under reading and listening conditions.

Figure 2. Mean Comprehension scores WRMT-R

APPENDIX D

WECHSLER INDIVIDUAL ACHIEVEMENT TEST



Mean comprehension scores of subjects with and without reading disabilities under reading and listening conditions.

Figure 3. Mean Comprehension Scores WIAT

APPENDIX E

INSTITUTIONAL REVIEW BOARD FORM

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
FOR HUMAN SUBJECTS RESEARCH

Proposal Title: THE IDENTIFICATION OF THE READING DISABELED STUDENT: A FUNCTIONAL STUDY

Principal Investigator: DR. R.M. JOSHI / JACKIE WOOD

Date: 9-21-92 IRB # ED-93-023

This application has been reviewed by the IRB and

Processed as: Exempt [X] Expedite [ ] Full Board Review [ ]

Renewal or Continuation [ ]

Approval Status Recommended by Reviewer(s):

Approved [XX] Deferred for Revision [ ]

Approved with Provision [ ] Disapproved [ ]

Approval status subject to review by full Institutional Review Board at next meeting, 2nd and 4th Thursday of each month.

Comments, Modifications/Conditions for Approval or Reason for Deferral or Disapproval:

PROVISIONS RECEIVED AND APPROVED

Signature: Marcia K. Tilley
Chair of Institutional Review Board

Date: 10-1-92

VITA

Jackie R. Wood

Candidate for the Degree of

Doctor of Education

Thesis: IDENTIFICATION OF THE READING DISABLED STUDENT: A FUNCTIONAL STUDY

Major Field: Curriculum and Instruction

Biographical:

Personal Data: Born in Waurika, Oklahoma. Married to James F. Wood, and the mother of Ryan Jay and Justin Michael Wood.

Education: Graduated from Waurika High School; received a Bachelor of Science degree from Cameron University, May, 1971; received a Master of Education from Southwestern Oklahoma State University, May, 1979; completed requirements for Doctor of Education degree at Oklahoma State University, May, 1993.

Professional Experience: University instructor of Reading and Language Arts; Special Education Regional Coordinator for the Visually Impaired; Itinerant teacher of the visually impaired; Itinerant teacher of the learning disabled; elementary classroom teacher.