

INTELLECTUAL, EDUCATIONAL AND DEMOGRAPHIC CHARACTERISTICS
OF STUDENTS WITH LEARNING DISABILITIES AND
SERIOUS EMOTIONAL DISTURBANCES

by

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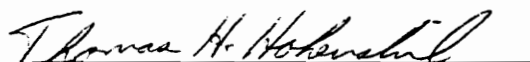
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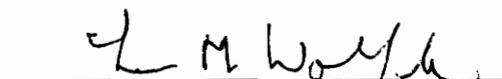
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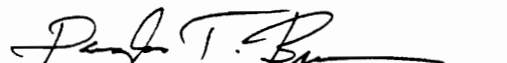
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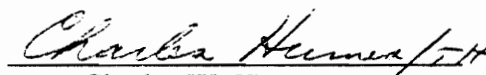
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(ABSTRACT)

This study examined the WISC-III, reading, math and selected family and demographic characteristics of 301 learning disabled students (LD) and 99 emotionally disturbed students (ED). Specifically, this study sought to determine which variables can successfully discriminate between LD and ED students and which variables can discriminate between the different service delivery models in which the students were taught.

Reading skills and the family composition were identified as statistically significant discriminators between the LD and ED students. Reading skills were also determined as significant discriminators among the LD service delivery models. Parent's educational level and WISC-III scale and subtest scores were measured as statistically significant discriminators for the ED service delivery models

To gain further understanding of the intellectual and academic achievement differences between LD and ED students, a series of t-tests were ran. The t-test results

indicated that the WISC-III scale profiles of the groups were similar. However, the reading skills were higher for the ED students. Correlation analyses revealed significant relationships among intelligence, achievement, family characteristics and the level of special services a student received. Students with higher IQ and achievement scores and who resided with their biological parents received fewer special education service.

It is recommended that school psychologists stop using the WISC-III to distinguish between LD and ED students. Furthermore, school psychologists need to incorporate comprehensive reading assessment practices and family assessment procedures to better understand the complex characteristics of LD and ED students. Finally, the results of this study suggest that there are more similarities than differences between LD and ED students which seem to support those who recommend non- or cross-categorical special education placements.

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Chapter 1

INTRODUCTION

The procedures used in the identification and assessment of students with learning disabilities (LD) and serious emotional disturbances (ED) have generated significant interest among professionals in education and psychology. Students referred for special education evaluations due to learning or emotional problems are typically administered a standard battery of tests designed to evaluate cognitive, academic, social, emotional, and perceptual motor functioning (Chittooran, D'amato, Lassiter & Dean, 1993). Since the 1975 passage of Public Law (PL.94-142), Education for All Handicapped Children's Act, now known as Public Law 101-476, the Individuals with Disabilities Education Act (IDEA), there has been considerable debate concerning the criteria used to identify students with LD and ED (Cullinan, Epstein & Kaufman, 1984; Fessler, Rosenberg & Rosenberg, 1991; Merrell & Shin, 1990; Ysseldyke, 1982). One reason there is such debate about the identification of LD and ED is that children with these disabilities frequently have similar learning and behavior problems (Epstein & Cullinan, 1983).

Specific Learning Disability and Serious Emotional Disturbance are two of the fourteen special education categories in the Regulations Governing Special Education Programs for Children With Disabilities in Virginia (1994). Students with a learning disability represent the largest group of students with disabilities in the United States (U.S. Department of Education, 1992). This categorical approach to the identification of

students with disabilities has been viewed by many professionals as unreasonable and a poor educational approach to meet the needs of students with disabilities, especially students with mild disabilities. Instead, a cross-categorical special education identification and placement process has been advocated. In a cross-categorical identification procedure, students are identified and placed in programs according to the student's learning needs without respect to their disability category (Gardner, 1977; Hallahan & Kauffman, 1976; Hewett & Forness, 1974; Lilly, 1979; Neisworth & Greer, 1975; Reynolds, Wang & Walberg, 1987; Stainbak & Stainbak, 1984).

Cross-categorical special education placements are also supported because of the difficulties associated with the Federal definition and terminology used for both LD and ED. Over 30 professional and advocacy groups proposed, in 1990, to replace serious emotional disturbance with new terminology of emotional and behavioral disorder (Forness & Knitzer, 1992). The National Association Of School Psychologists (Dwyer, 1994) has recommended that Congress rewrite the disability categories using generic categories similar to those used for the American with Disabilities Act (1990) and the Rehabilitation Act (1973). The definition would read: "Children with disabilities means children who have a physical or mental impairment which substantially limits the major life activity of academic, social and developmental learning (Dwyer, 1994 p. 10)." This language is consistent with the American with Disabilities Act.

It is the position of National Association Of School Psychologists that a more generic label would reduce the belief that a distinctive educational approach or program is

appropriate for a specific categorical disability such as LD or ED. Much of the controversy surrounding the LD definition focuses on what constitutes appropriate assessment practices and identification procedures (Merrell & Shinn, 1990). The special education language included in the Virginia regulations that states "the team (eligibility committee) finds that a child has a severe discrepancy between achievement and intellectual ability" (Regulations Governing Special Education Programs, 1994 p. 19) as one of the criteria to determine LD has been an area of significant concern. The IQ-achievement discrepancy formula utilized by many school systems in making the determination if a severe discrepancy between achievement and intellectual ability exists has been viewed as statistically flawed and leads to poor decision making (Mckinney, 1987; Wilson, 1985; Algozinne & Ysseldyke, 1983). Furthermore, the IQ-achievement discrepancy formula has not effectively separated students with a learning disability and students with a serious emotional disturbance in distinct educational or clinical groups (Hallahan & Kauffman, 1976, 1977).

Rationale for Study

Public Schools throughout Virginia are mandated with the responsibility of identifying and appropriately educating students with learning disabilities and emotional disturbances under PL 101-476, the Individuals with Disabilities Education Act (IDEA). The standardized individual assessment procedures used in the identification of LD and ED have been questioned for their ability to differentiate between students who are LD

and ED (Tindale & Marston, 1986; Webster & Shenk, 1978; Vance, Fuller and Ellis, 1983).

The following study examines the relationships between achievement, intelligence and significant family and educational background information for identified students with a learning disability and students with a serious emotional disturbance. This research will help explain the unique characteristics of students most at risk for identification as learning disabled or serious emotionally disturbed. There have been limited studies that have examined and compared the intellectual and achievement profile of identified students with LD and students identified as ED, as measured on the Wechsler Intelligence Scales for Children- Third Edition (WISC-III), and on individualized achievement tests (Slate, Jones, Graham & Bower, 1994). Durrant (1994) reports that IQ and achievement levels of children with learning disabilities are poorly reported in the research. Durrant indicates that IQ and achievement levels are often the most difficult information to obtain, but they are the most valuable characteristics to better understand the profile of children with learning disabilities. The unique characteristics of students with learning and emotional problems makes investigating these relationships very important (Hishinuma & Yamakawa, 1993).

The LD population continues to grow representing approximately 50 percent of the identified special education students and 5 percent of the total school age population; and the ED population represents less than 1 percent of the total school age population and 9 percent of the special education population (U.S. Department of Education, 1992).

The ED population has been recognized as an under served group with particularly complex needs (U.S. Department of Education, 1986). Effectively educating children with serious emotional disturbances is important. Children with serious emotional disturbances fail more classes than any other group of children, are retained more often than other children, and have a higher absenteeism rate than any other disability category (Chesapeake Institute, 1994). According to a 1993 report published by SRI International, entitled The National Longitudinal Transition Study of Special Education Students and Youth With Disabilities: How are They Doing?, 58 % of students with serious emotional disturbances have an encounter with the justice system compared to 30% of all students with disabilities. According to the same study, children who are identified as serious emotionally disturbed, are more likely than any other group of special education students to be educated in restrictive settings and to drop out of school.

The problem of educating children with serious emotional disturbances has become such a concern that the U.S. Department of Education's Office of Special Education Programs (1994) has set a national agenda for achieving better results for children and youth with serious emotional disturbances. One of the seven target goals set by the Office of Special Education Programs is to "Promote Appropriate Assessment". Specifically, this target goal is designed to ensure that assessments are practical and are relevant in developing programs for children requiring special education services. This study will assist policy makers and educators in developing effective service delivery models for students identified as LD or ED.

In addition, this study will help settle the debate whether categorical or non-categorical placement policies are more appropriate when addressing the educational needs of students with learning disabilities and students with serious emotional disturbances. This study will add to the discussion of whether the WISC-III, the most widely administered intelligence test among psychologists (Cohen, Swerdlik & Smith, 1992) is a valuable instrument to help identify and differentiate children who are suspected of being LD or ED. This study will help school psychologists better understand if traditional psycho-educational assessment practices are the best procedures for differentiating LD and ED or whether other educational and socio-cultural variables are more relevant. Since school psychologists spend approximately 50% of their time in assessment activities (Benson & Hughes, 1985; Hutton, Dubes & Muir, 1992; Smith, 1984), the study should be of extreme importance to the field of school psychology.

The following research statements guided this study:

- 1) There will be no differences among students with a learning disability and students with a serious emotional disturbance using the Verbal, Performance and Full scale IQ scores on the WISC-III.

- 2) Students with a serious emotional disturbance will score higher than students with a learning disability using the standardized reading and math scores from individually administered achievement tests.

- 3) Students with learning disabilities will score lower on verbal comprehension and vocabulary subtests on the WISC-III than students with serious emotional disturbances.
- 4) There is a cluster of intellectual, educational and demographic variables that discriminate between the learning disabilities and serious emotional disturbances classification.
- 5) There is a cluster of intellectual, educational and demographic variables that discriminate the service delivery model for students with a learning disability and students with a serious emotional disturbance.

Limitations of Study

The sample of students with learning disabilities and students with serious emotional disturbances selected for this study represented a specific geographic location from the Northern Shenandoah region of Virginia. Although the three school systems that participated in this study diagnose students with learning disabilities and students with serious emotional disturbances, according to the Regulations Governing Special Education Programs for Children with Disabilities in Virginia (1994), the results of this research should be generalized with caution. This study also incorporated existing data from

particular intelligence and achievement tests. School systems that administer different tests and employ a different criteria to determine a significant discrepancy between ability and achievement should not generalize these findings to their specific school systems.

Delimitations

The following delimitations were imposed on this study by the author:

Students that were administered intelligence tests other than the WISC-III and students who were administered achievement tests different than the Kaufman Test of Educational Achievement (K-TEA), the achievement battery of the Woodcock Johnson Psycho-Educational Test (WJ-R) and the Wechsler Individual Achievement Test (WIAT) were not included. However, due to the popularity of these instruments very few students were excluded. Behavioral and personality assessment data were excluded from this study due to concerns related to reliability and validity (Welch, 1984), and a lack of consensus among the school systems on behavioral assessment procedures. Finally, students with the dual diagnosis of ED and LD were excluded because of the small sample size.

Definition of Terms

To facilitate a better understanding of the text, some of the commonly used terms are identified.

- 1) Individual with Disabilities Education Act (IDEA)- is Public Law (PL) 101-476, which mandates a free appropriate public education for all children ages 3-21.

- 2) Free Appropriate Public Education - means special education and related services that are provided at public expense, under public supervision and direction and without charge.

- 3) Special Education- means specially designed instruction, at no cost to the parents, to meet the unique needs of a child with a disability.

- 4) Evaluation- means procedures used to determine whether a child has a disability and the nature and extent of the special education and related services that the child needs. The term means procedures used selectively with an individual child and does not include basic tests administered or procedures used with all children in a school, grade or class.

- 5) Individualized education program (IEP)- means a written statement for each child with a disability that describes the specially designed instruction to meet the unique needs of the child's disability.

- 6) Serious emotional disturbance (ED)- means as follows:
 1. A condition exhibiting one or more of the following characteristics over a long period of time and to a marked degree, that adversely affects a child's educational performance:

- a. An inability to learn which cannot be explained by intellectual, sensory, or health factors;
 - b. An inability to build or maintain satisfactory interpersonal relationships with peers and teachers;
 - c. Inappropriate types of behavior or feelings under normal circumstances;
 - d. A general pervasive mood of unhappiness or depression; or
 - e. A tendency to develop physical symptoms or fears associated with personal or school problems.
2. The term includes children who are schizophrenic, but does not include children who are socially maladjusted unless it is determined that they are seriously emotionally disturbed (Federal Register, 42, 474, 1977).
- 7) Specific Learning Disability (LD)- means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell or to do mathematical calculations. The term includes such conditions 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, of emotional disturbance, or of environmental, cultural,

or economic disadvantage (Federal Register, 1977, p.65083).

- 8) Testing- means individual evaluation procedures (formal testing and assessment) to determine initial or continued eligibility for special education services.

- 9) Eligibility committee means" a committee which includes, but not be limited to, school division personnel representing the disciplines providing assessments and the special education administrator, or designee... (Regulations Governing Special Education Programs in Virginia, 1994 p 19)." The eligibility committee determines the student's eligibility for special education services.

- 10) Eligible for LD means the following:
 - a. The child does not achieve commensurate with his or her age and ability levels in one of the following areas listed in paragraph b of this section when provided with learning experiences appropriate for the child's age and ability levels; and

 - b. The team finds that a child has a severe discrepancy between achievement and intellectual ability in one or more of the following areas:
oral expression, listening comprehension, written expression, basic reading

skills, reading comprehension, mathematical calculations or, mathematical reasoning.

- c. The multi-disciplinary team may not identify a child as having a specific learning disability if the severe discrepancy between ability and achievement is primarily the result of (1) a visual, hearing or motor disability, mental retardation, serious emotional disturbance, environmental, cultural, or economic disadvantage (Regulations Governing Special Education Programs in Virginia, 1994 p. 17 & 18).
- 11) Resource instruction- means students who receive less than 50 percent of special education services.
- 12) Self contained- means students who receive 50 percent or more of special education instruction.
- 13) Separate day program- means students who receive a 100 percent of their school day in a special education facility.
- 14) Simple difference score model- means a single IQ score from the WISC-III is compared to a single standard score on an individualized achievement test.

- 15) Reading decoding- reading letters to pronounce words.
- 16) Reading Comprehension - relating ideas and meaning to printed words.
- 17) Math computation - means completing math calculations such as addition, subtraction, multiplication, division, fraction, etc.
- 18) Math applications - means using math calculations to solve real and hypothetical problems.
- 19) Family Composition - means either intact family (both biological parents), or not intact (single parent home, step parent and biological parent, other relatives or foster placement).

Summary

While it is acknowledged that the diagnosis of LD and ED is controversial and often difficult, school systems throughout the United States are still responsible for this important task as mandated by Federal law. Many studies have looked at the intellectual and academic skills of students with learning disabilities and a few have investigated the intellectual and academic skills of students with serious emotional disturbances. There are a limited number of studies that have incorporated the WISC-III as an intelligence

measure. In general, studies have neglected to look at the relationships of intelligence, achievement and socio-cultural variables of students with either learning disabilities or serious emotional disturbances to understand the differences and similarities of both populations. This study will not only help school systems better predict which students are at risk for LD and ED services, but it will also challenge school systems to reevaluate their assessment procedures. Specifically the role of the WISC-III instrument and individualized achievement tests in the diagnosis of LD and ED will be explored for its diagnostic importance.

This document is organized so that chapter One provides the overview, rationale, limitations and definitions pertinent to this study. Chapter Two provides a literature review on this and related areas. Chapter Three addresses the methodology necessary for implementation of the study. Chapter Four contains the statistical results and interpretations of the results. The final chapter summarizes the study and provides implications for practice and research.

Chapter 2

REVIEW OF LITERATURE

This chapter summarizes opinion and empirical studies pertinent to the understanding of the evaluation and identification procedures used to diagnose a learning disability (LD) and a serious emotional disturbance (ED) for school age children. The evaluation and identification procedures utilized by multi-disciplinary special education committees are areas of considerable controversy. Much of the literature reviewed will discuss the problems associated with current individualized intelligence and achievement testing practices to diagnose LD and ED. Furthermore, this chapter will examine the controversy surrounding the eligibility criteria for identifying students as LD or ED.

Since the 1975 passage of PL. 94-142, Education for All Handicapped Children's Act, special education has primarily operated from a categorical process. Children suspected of having a disability were evaluated, identified, and placed in a special education program depending upon the label they received (Lee, 1982). The U.S. Department of Education in 1992 reported that approximately 10% of school age children are receiving special education services. According to the Department of Education's 15th Annual Report to Congress (1992), there were approximately 4.5 million school age children identified with a special education disability. Students with LD represented approximately half of the students identified with a special education disability. There was a 4.9 percent increase of identified students with learning disabilities from 1991 to 1992, and LD services have doubled since the mid 1970's (Hallahan & Kauffman, 1994).

Students identified as ED during the 1991-1992 school year represented less than one percent of the total school population and approximately 9 percent of the special education population. Other studies have revealed that 6-10 percent of school age children exhibit serious emotional problems (Bradenburg, Friedman, & Silver, 1990; Kauffman, 1993; Kazdin, 1989). A 1988 study by the National Health Interview Survey of Child Health (NHI-CH) indicated that approximately 10% of children ages 3-17 had received psychological assistance (Zill & Schoenborn, 1990). A similar study completed by NHI-CH in 1981 found that 6.5 percent of children ages 3-17 had received psychological help because of emotional, mental or behavioral problems (Zill & Schoenborn, 1990).

LD Identification

The significant increases in the identification of LD and the under identification of ED have been viewed by many as a problem caused by poor identification procedures and a lack of consensus among professionals on what constitutes LD and ED (Cullinan, et al. 1984; Fletcher, 1992; Mckinney, 1987; Siegel, 1989; Stanovich, 1991). Since the 1960's, eleven different definitions of learning disabilities have generally been accepted (Hammell, 1990). Hallahan and Kauffman (1994 p. 162) identified four criteria that are included in some, but not all, of the definitions:

1. IQ-achievement discrepancy.
2. Presumption of central nervous system dysfunction.
3. Psychological processing disorders.

4. Learning problems not due to environmental disadvantage, mental retardation, or emotional disturbance.

In the field of learning disabilities, debate continues on what is LD, what are acceptable evaluation methods and identification practices, and if a learning disability is a correct classification (Algozzinne & Ysseldyke, 1983; Coles, 1988; Kavale & Forness, 1985). The lack of agreement of what is the most critical factor for an LD diagnosis is demonstrated by the positions taken by leading LD researchers. A study by Merrell and Shinn (1990) highlighted some of the diverse opinions on what are the critical variables in the learning disabilities identification process: neurologically based perceptual processing difficulties (Cruickshank, 1984); significant ability-achievement discrepancy (Wilson, 1985); and low academic achievement (Algozzinne, 1985; Ysseldyke, Algozzinne, Shinn & McGue, 1982). The absence of an operational definition has been viewed as a major cause for the significant increase of students being identified as LD (Algozzinne & Ysseldyke, 1984; Reynolds, 1985). Many experts do agree that the LD criteria that is common in all definitions is the criteria that a severe discrepancy between aptitude and achievement exists (Merrell & Shinn, 1990).

A study by Frankenberger and Fronzaglio (1991) indicated that states are moving towards an adoption of ability-achievement discrepancy criteria for identifying LD. Their study indicated that between 1988 and 1990, 40% of states had changed their guidelines for LD and now 76% of states have adopted an ability-achievement discrepancy formula. An earlier study completed by Frankenberger and Harper in 1987 revealed that in, 1981-

1982, 33% of the states adopted an ability-achievement discrepancy criteria and in 1985-1986 it had increased to 57% . A survey of State Departments by Mercer, Hughes & Mercer (1985) confirmed that the trend for LD diagnosis is towards a more exact evaluation and identification procedure. The goal to operationalize an LD identification procedure at the State level has driven the ability-achievement criteria as the important variable and has minimized the importance of neurological, social skills and psychological processing deficits as important variables (Merrel & Shinn, 1990).

The identification of a learning disability based upon a severe discrepancy between ability and achievement has been well researched with diverse findings. The major areas of disagreements with the severe discrepancy criterion is the lack of consensus on what is a severe discrepancy (Epps, Ysseldyke & Algozzine, 1983; Reynolds, 1985), and poor statistical formulas that have psychometric deficiencies such as the non standard score models (Wilson, 1985; Reynolds, 1985; Hanna, Dyck & Holen, 1979) which compare two non standard scores such as chronological age, actual achievement, grade age and grade placement. Berk (1984) and Reynolds (1990) have argued that age and grade equivalents, and percentile ranks have serious statistical limitations as metrics for discrepancy analysis.

Only standard scores have been advocated by leading experts as the appropriate metric for calculating discrepancies (Reynolds, 1985). A study by Mercer, King-Sears and Mercer (1990) indicated that out of the 30 states that have specific criteria for a severe discrepancy, 17 states follow a simple difference model and 13 use a regression model. The acceptance of the simple difference model may be due to the simple mathematical

formulas of subtracting two standard scores and the ease in interpreting the results to others (Evans, 1992). Concerns with the simple difference model is that the simple subtraction of standard scores ignores the correlations between the two scores and often error of measurement is not considered (Braden & Weiss, 1988). The simple difference method to be used correctly must determine if the difference between ability and achievement are statistically significant and how frequently does this difference occur in the standardization sample (Berk, 1982).

The regression model defines a discrepancy as the difference between expected and obtained achievement. Regression models have been used for many years and the justification was explained by Thorndike (1963): "It is necessary to define 'underachievement' as discrepancy of actual achievement from the predicted value, predicted on the basis of regression equation between aptitude and achievement"(p. 13).

Shepard, (1980) an early advocate of the regression model, summarized the advantages of the regression model, indicating that "expected performance is predicted from aptitude scores, so that children from the full ability continuum will be identified... Therefore, LD children are clearly distinguished from slow learners" (p. 84).

The two basic equations of the regression model "are the calculation of expected achievement and the discrepancy scores" (Evans, 1992). Looking at the advantages of one model over another is not the intent of this research. However, past studies have indicated that a regression model may be more statistically sound (Reynolds, 1984) and a better predictor of LD for minorities (Evans, 1992). The majority of school psychologists who

work in states that utilize a regression model have accepted the model (Evans, 1992; Mclesky & Waldron, 1991; Smith, 1991).

The regression model is not without its critics. A recent study by Evans (1992) concluded that regression models do not address the concerns of identification at low IQ levels, a criticism of the simple difference standard score model. Berk (1984) indicated that the regression model can be flawed due to imperfect correlations which may contribute to discrepancies due to prediction error as well as true differences. Hammell (1990) disagrees with the use of a regression mathematical equation model to determine LD. He contends, like others, that it was never the intent of the Federal guidelines to operationalize LD using a severe-discrepancy model and that discrepancy models cannot accurately and consistently discriminate children with LD from children without LD (Algozinne & Ysseldyke, 1987; Algozinne, Ysseldyke & Shin, 1982).

ED Identification

The process involved in the identification of children who may warrant special education services because of a behavior that adversely affects their educational performance has been problematic. These children are identified as either being emotionally handicapped, emotionally impaired, behavior disordered or seriously emotionally disturbed. The primary problem associated with the identification of children with ED is the lack of consensus on an appropriate interpretation of the Federal special education ED definition (Balow, 1979; Bower, 1982; Forness, Sinclair & Russel, 1984). The Federal definition that governs the rules and regulations of IDEA is controversial and

often criticized. Critics have questioned why "socially maladjusted" children are excluded from ED services (Cline, 1990). The exclusion of children with social maladjustment problems often result in that the child will receive no or limited help to meet their emotional or behavioral problems (Knitzer, Steinberg & Fleish, 1990). Another problem with the ED definition is the clause that states " which adversely affects educational performance". It is ambiguous and does not provide evaluators with a definition of educational performance (Hallahan & Kauffman, 1994).

Adverse educational performance can mean just academic, or it can mean academic, social or behavioral performance (Forness, Kavale & Lopez, 1993). Children who cannot meet the academic and social demands of formal education have been of great interest to mental health professionals and educators (Telegdy, 1974). One difficulty in the diagnosis of children who are ED is that the diagnostic categories within special education share common characteristics, which often lead to disagreement among professionals regarding the proper diagnosis (Fuller & Goh, 1981).

The differential diagnosis between ED and LD is often difficult (Thompson & O'Quinn, 1979). One reason the differential diagnosis is difficult is because many school psychologists do not feel that they have the necessary skills for conducting assessments of children with serious emotional disturbances (Barbanel, Huffenberg-Rutman, 1974). Ramage (1979) found, in a representative sample of the membership of the National Association of School Psychologists (NASP), that approximately one-third of those surveyed expressed the greatest need for training and continuing education in the

assessment of children with emotional problems. A national survey completed by Prout (1983) found that more than half of all school assessments called for the assessment of serious emotional disturbances, however, many practicing school psychologists do not perceive themselves as having the necessary training to conduct these assessments.

In a 1977 study of all 50 state departments of education (Epstein, Cullinan & Sabatino), 11 different ED components were identified. The components included: (1) disorders of emotional/behavior, (2) interpersonal problems, (3) learning achievement problems, (4) deviation from behavioral norms, (5) chronicity of problems, (6) prognosis for improvement, (7) specific causal phenomena, (8) exclusion i.e., no sensory or physical impairments, (9) special class placement required, (10) eligibility for services was certified and (11) severity of problems. Hallahan and Kauffman (1977) boldly stated " when the meaning of ED in children is sifted out of the definition, it appears that a child is disturbed when an adult authority figure says he is (p 140)."

Hallahan and Kauffman (1994 p 206) summarized the reasons why it is difficult to agree on an ED definition:

- . Lack of precise definitions of mental health and normal behavior.
- . Differences among conceptual models.
- . Difficulties in measuring emotions and behavior.
- . Relationships between emotional and behavioral disorders and other disabilities.

Differences in the professionals who categorize and serve children and youth.

A review of the various definitions do show some common features in defining ED (Hallahan & Kauffman, 1994). The general agreements are:

- . Behavior that goes to an extreme.
- . A problem that is chronic.
- . Behavior that is unacceptable because of social or cultural expectations.

Review of Standardized Assessment Instruments.

Wechsler Intelligence Scale for Children-Third Edition (WISC-III)

The Wechsler Scales have been the intelligence test of choice for the cognitive assessment of school age children since the 1974 publication of the Wechsler Intelligence Scale for Children-Revised (WISC-R). The WISC-III, a 1991 revision of the WISC-R (Wechsler, 1974), is the primary intelligence instrument utilized by psychologists (Cohen et al., 1992). The main reason for revising the WISC-R was to update the norms that were nearly 20 years old (Wechsler, 1991). Approximately 73% of the WISC-R test items remain in the WISC-III in either original or slightly modified format (Wechsler, 1991). The WISC-III Full Scale IQ scores are approximately 5.3 points lower than the WISC-R Full Scale Scores (Wechsler, 1991) for normal children. This was expected as part of the new standardization procedures (Kaufman, 1994).

Most studies of exceptional groups report a similar difference in the Full Scale IQ

scores (Doll & Boren, 1993; Newby, Recht, Caldwell, & Schaefer, 1993). Dumont and Faro (1993) suggest that the Full Scale IQ difference may actually be greater for some special education populations.

The WISC-III is an individually administered intelligence test for children ages 6 through 16 years, 11 months. The WISC-III contains 13 subtests, 6 in the Verbal scales and 7 in the Performance scales. Five subtests in each scale are administered as part of the standard administration. According to the WISC-III manual (Wechsler, 1991) the WISC-III was standardized on 2,200 children, 100 boys and 100 girls in each of the 11 age groups from 6 through 16 years. The WISC-III has outstanding reliability (Sattler, 1992). The three scales have internal consistency reliability coefficients of .89 or better over the entire range covered in the standardization group. The average internal consistency reliability coefficients and test-retest reliability coefficients for the scale IQs range from .87 to .96, and the standard error of measurement for the scale IQs are the following: Verbal IQ 3.53, Performance IQ 4.54, and Full Scale IQ 3.20 (Wechsler, 1991).

Since the WISC-III is a relatively new instrument, there are limited validity studies. The validity studies in the WISC-III manual suggest satisfactory concurrent and construct validity (Sattler, 1992).

Wechsler described intelligence as the "capacity of the individual to act purposefully, to think rationally, and to deal effectively with his or her environment" (Wechsler, 1944 p.3). The organization of the WISC-III represents Wechsler's belief that

intelligence is not a single ability, but intelligence is a global capacity to deal effectively with the environment (Nicholson & Alcorn, 1993). The WISC-III is divided into Verbal and Performance Scales. The five subtests from the Verbal Scale and the five subtests from the Performance Scale are used to calculate the Full Scale score. The sum of the scaled scores on the Verbal subtests yield the Verbal IQ score and the sum of the scaled scores on the Performance subtests yield the Performance IQ (Wechsler, 1991). The Full Scale IQ score is determined by the scores on the Verbal and Performance subtests. The IQ scales have a mean of a 100 and a standard deviation of 15.

Like the WISC-R, the Verbal Scale on the WISC-III is dependent upon a child's previous experiences (Sattler, 1988). Sattler (1988) indicates that the Verbal Scale measures overall language ability and crystallized intelligence. The Verbal Scale measures a child's language development and is more auditory, while the Performance Scale assesses nonverbal ability, fluid intelligence and visual processing skills (Kaufman, 1994; Sattler, 1988). A study by Carrol (1993), in which 460 data sets in the factor analytic literature were examined, led him to propose a three-stratum theory of cognitive abilities. His theory was an expansion of Cattell and Horn's GF/GC Theory (1978) and the three level model proposed by Gustafsson (1984). In summary, Carrol's study concluded that the Full Scale IQ aligns closely to the third general factor *g* or one's general ability. The Verbal IQ corresponds to *Gc*, crystallized intelligence, and the Performance IQ is similar to the *Gv*, broad visual perception.

It is not unusual for psychologists to also interpret four specific factors: Verbal

Comprehension, Perceptual Organization, Processing Speed and Freedom from Distractibility (Sattler, 1992). The first three factors account for 25, 16 and 10 percent of the variance respectively (Sattler, 1992). The Freedom from Distractibility factor was found to be insignificant (Sattler, 1992).

The interpretation of Verbal-Performance IQ differences is an accepted and almost expected analytical approach in the interpretation of the WISC-III scales (Kaufman, 1994). The critical significant difference values range from 10 to 13 at the .05 level, and 13 to 17 at the .01 level (Sattler, 1992). The average values are 11 points at the .05 level and 15 points at the .01 level. Kaufman (1994) suggests that a difference of 11 or more points between Verbal and Performance IQ deserves to be treated as statistically significant. It is also important to determine not only if the discrepancy is significant, but what is the frequency of the discrepancy (Kaufman, 1994). The WISC-III manual (Wechsler, 1991) reports that 2 out of 5 normal children have significant Verbal-Performance discrepancies at the .05 level. Kaufman (1994) reports that a discrepancy of 19 points would be considered "abnormal". He based this decision on data that is included in the WISC-III manual (Wechsler, 1991) that allows the examiner to judge the magnitude of the discrepancy compared to the standardization sample. The overall Verbal IQ has a higher reliability coefficient than the Performance IQ on the average (.95 vs. .91) (Kaufman, 1994).

Individual subtest analysis and comparisons are frequently used to make inferences about significant cognitive strengths and weaknesses to help determine recommendations

and treatment for the evaluated (Kaufman, 1976; Kaufman, 1993; Sattler, 1988).

However, problems develop with this approach when subtests are viewed as isolated sets of skills without correctly comparing them to the Verbal, Performance and Full Scale IQ scores (Watkins & Kush, 1994). Subtest analysis has been questioned for both its statistical and theoretical grounds (Cahan & Cohn, 1988; Reschly & Grimes, 1990). A study by Watkins and Kush (1994) that compared the WISC-R profile of 1222 special education students to the normative population concluded that only 4% of the subtest profiles were statistically different than the norm populated. They strongly recommended that subtest profile analysis be avoided. Their research also revealed that a greater proportion of special education students had Verbal, Performance and Full Scale IQ scores in the average to low average range than the normative sample and a smaller proportion of students in the high and above average classification.

The WISC-III is a well respected test and most popular test of mental ability among school psychologists (Cohen et. al, 1992). However, it is not without its critics. Some critics oppose individual subtest analysis of the WISC-III (McDermott, Fantuzzo, Glutting, Watkins & Baggaley, 1992) because of questionable psychometric properties. McDermott et al., favor the global IQs over the subtest analysis (1992). Sternberg (1993) feels that the WISC-III does not present a breakthrough in intelligence testing and is basically a recycled WISC-R instrument. However, Sternberg implies that given the choice of today's intelligence tests, he would use the WISC-III because of its good prediction of academic performance and its overall psychometric quality. Shaw, Swerdlik

and Laurent (1993) state that the WISC-III "may be nothing more than a new and improved dinosaur (p.159)."

Wechsler Individual Achievement Test (WIAT)

The WIAT is an individually administered battery designed to evaluate the achievement of children grades K-12. The WIAT measures basic reading, mathematic reasoning, spelling, reading comprehension, numerical operation, listening comprehension, oral expression and written expression (grades 3-12). According to the authors (Psychological Corporation, 1992) the WIAT is unique in two ways. First, the WIAT was developed to be linked with the WISC-III scales. The characterization of the WIAT standardization sample is comparable to the WISC-III standardization sample. The WIAT manual (Psychological Corporation, 1992) indicates that the WISC-III and WIAT shared a common linking sample of 1,118 children and the normative sample for each test instrument used similar stratification percentages. The second unique feature is that the WIAT attempts to measure all areas of a learning disability defined in Public Law 94-142 (1975).

The WIAT subtest raw scores for each age and grade were converted to a scale with a mean of a 100 and a standard deviation of 15 (Psychological Corporation, 1992). Age based reliability coefficients were reported in the manual for the math and reading composites at greater than .90 with the exception of age 5 in mathematics (.83). The average age-based standard error of measurements for the reading and math composites are 3.65 and 4.30 respectively. The average subtest standard error of measurement ranged

from 4.32 in basic reading to 6.03 in numerical operations.

A critique of the WIAT by Gallagher and Myers (1995) indicated that the reliability scores for the overall scale scores are highly reliable and the composite scale scores are sufficient. They caution against using only the subtest scores for diagnostic purposes. Gallagher and Myers also discourage using the WIAT scores for the purposes of developing or monitoring treatment interventions. This conclusion was based upon questionable content and construct validity evidence presented by the authors of the WIAT.

Kaufman Test of Educational Achievement (K-TEA)

The K-TEA (Kaufman & Kaufman, 1985) is an individually administered measure of academic achievement of children in grades 1 through 12. Age norms are presented in the manual (Kaufman & Kaufman, 1985) for 6 years to 18 years, 11 months. The test measures math applications, math computation, spelling, reading decoding and reading comprehension. The reading composite score is based upon the reading decoding and reading comprehension raw scores, and the math application and computation scores make up the math composite. Raw scores are converted into standard scores, mean of a 100 and a standard deviation of 15, for each subtest as well for the composite score.

The reliability for the K-TEA is reported to be at or above .90, which is considered very good (Doll, 1989). The average standard errors of measurement for the reading composite is 2.7, and for the math composite 3.2. Average standard error of measurements for the reading and math subtests ranged from 3.2 in reading decoding to

4.0 in reading comprehension. The K-TEA was described by Sattler (1989) as a "well normed standardized individual test of educational achievement (p. 334)." Concurrent validity studies with various ability and achievement tests are in the .60 to .80s (Kaufman & Kaufman, 1985).

Woodcock-Johnson Psycho-Educational Battery-Revised. Test of Achievement (WJR-ACH).

The WJR-ACH (Woodcock & Johnson, 1989, 1990) is a revised and expanded version of the 1979 Woodcock-Johnson Psycho-Educational Battery (Woodcock & Johnson, 1979). The WJR-ACH is an individually administered achievement test normed for ages 2 through 95 years. The standard battery of the WJR-ACH includes letter-word identification, passage comprehension, math calculation, applied problems, dictation, writing samples, science, social studies and humanities. The reading composite consists of letter-word identification and passage comprehension, and math computation and applied problems create the math composite. According to the authors of the WJR-ACH manual (Woodcock & Mather, 1989,1990), the normative data was collected from a stratified random sample. The standard scores, mean of a 100 and a standard deviation of 15 are consistent with the WIAT and K-TEA. Reliability coefficients are in the high 80s to low 90s for the individual subtests and low to mid 90s for the reading and math composites (Woodcock & Mather, 1989, 1990). The median standard errors of measurement for the reading and math composites are 4.1 and 3.6 respectively. The median standard errors of

measurement for the reading and math subtests ranged from 3.6 in reading comprehension to 5.5 in mathematics reasoning (Woodcock & Mather, 1989, 1990). Validity studies cited in the manual for ages 3, 9 and 17 range from .50 to .70. Woodcock and Mather (1989, 1990) indicate that the reliability and validity properties meet basic technical requirements for individual placement and programming decisions.

Comparisons of the Three Achievement Instruments.

Criterion related evidence of validity provided in the WIAT manual (Psychological Corporation, 1992) demonstrated that the WIAT and the K-TEA had correlation scores in the reading and math subtests of .78 to .87. Validity information comparing the WIAT to WJR-ACH on the reading and math subtests ranged from .67 to .79. Concurrent validity studies reported in the WJR-ACH examiners manual (Woodcock & Mathers, 1989, 1990) with the K-TEA showed correlations of .850 and .834 for reading and math at age 9, and .485 and .734 in reading and math at age 17.

The acceptance of these achievement instruments by school psychologists was recently ascertained on a national survey (Stinnet, Havey & Oehler-Stinnet, 1994). The results of this survey indicated that a national representation of school psychologists identified the WJR-ACH as the most widely used and important achievement instrument. The K-TEA was reported as the third most used and second most important achievement instrument. The WIAT was not included in this survey.

WISC-III Profiles of Students with Learning Disabilities (LD) and Serious Emotional Disturbances (ED).

There are limited studies that have examined the relationships between the WISC-III and achievement test scores for students with learning and emotional disorders (Slate, Jones, Graham & Bower, 1994). The research examining the relationship between the WISC-III and academic achievement for special populations is greatly needed (Slate et al., 1994). The WISC-III manual (Wechsler, 1991) presents the means and standard deviations of WISC-III IQ scores for 65 children with learning disabilities. The children with LD scored slightly lower on the Verbal IQ scale than on the Performance IQ scale. These findings were consistent with earlier WISC-R studies that concluded that children with LD have higher performance scores than verbal scores (Sattler, 1988; Schmidt & Saklufske, 1983; Smith, Smith, Mathews & Kenny, 1993). A study by Dean (1977) suggested that, as a group, children with serious emotional disturbances also exhibit a weaker performance in their verbal functioning and have more subtest scatter than normal children.

Researchers have also identified that the Verbal-Performance IQ discrepancies among children with learning disabilities is not remarkably different from the general population (Berk, 1982; Kaufman, 1994; Naglieri, 1979) and cannot discriminate children with LD from the general population (Luffi & Cohen, 1988) and children with ED (Vance & Fuller, 1983). Two studies of children with learning disabilities revealed an insignificant difference of Performance > Verbal IQ on the WISC-III (Prifitera & Dersh, 1993; Slate et

al., 1994). Students with learning or reading problems have historically scored lower on the Verbal IQ section than the Performance IQ section (Kaufman, Harrison, & Ittenbach, 1990; Prifitera & Dersh, 1993; Rugel, 1974; Slate et al., 1994). The Verbal IQ subtests are more closely related to school performance and school related tasks which are generally difficult for students with learning disabilities (Kaufman, 1994). Lower Verbal IQ scores have been associated with problems in specific knowledge, language, vocabulary and memory (Nicholson & Alcorn, 1993; Siegel & Ryan, 1988; Vellutino, 1978, 1979). However, children with LD who have impaired fine motor skills, visual spatial deficits and arithmetic problems may score higher on the Verbal IQ section than the Performance IQ section (Rourke & Finlayson, 1978; Siegel & Feldman, 1983).

The WISC-III manual (Wechsler, 1991) includes a study of 26 students who were receiving ED services because of severe conduct problems. The mean scores on the Verbal IQ, Performance IQ and Full Scale IQ were 77.9 (SD=10.5), 82.2 (SD=15.7) and 78.1 (SD=13.5) respectively. Research studies on juvenile delinquents reveal that, as a group, juvenile delinquents perform better, but not significantly greater, on the Performance IQ section than the Verbal IQ section (Andrew, 1974; Cornell & Wilson, 1992; Culbertson, Feral, & Gabby, 1989; Eaves & Cutchen, 1990; Grace & Sweeny, 1986; Meinhardt, Hibbett, Koller, & Busch, 1993; Rosso, Falasco, & Koller, 1984; Zimmerman & Woo-Sam, 1972).

Hallahan and Kauffman (1994) indicate that the average student with emotional problems has an IQ around 90, and only a few students with emotional problems have high

IQs. This profile also holds true for achievement standardized test scores (Kauffman, 1993). A study by Watkins and Kush (1994) that investigated the WISC-R profiles of students with learning disabilities and students with serious emotional disturbances enrolled in a southwestern school district revealed that their IQ profiles were statistically similar. However, when compared with the reading and math composites of the Woodcock- Johnson Psycho Educational Achievement Test (Woodcock & Johnson, 1988, 1989) the LD group had a greater discrepancy in both achievement areas. A study by Hamm and Evans (1978) researched the WISC-R subtest patterns for children with emotional disturbances and concluded that there was no significant pattern that would distinguish children with serious emotional disturbances from normal children. Other researchers concluded that there is an absence of particular patterns of scores that differentiate children with ED from normal children (Hale & Landino, 1981). Furthermore, findings by Schooler, Beebe and Koepke (1978) showed that the score patterns on the WISC-R failed to discriminate children with ED from children with LD. However, studies by Morris, Evans, and Pearson (1978) concluded that there is a WISC-R subtest pattern difference between children with ED and the standardization sample focusing on Kaufman's (1975) three factor description of the WISC-R. The children in their study scored lower than the standardization sample on all three factors. The Verbal and Performance IQ scores were not significantly different.

A study by Thompson (1980) suggests three reasons why the research is inconclusive. First, emotionally disturbed, behaviorally disordered, and learning disabled

are not precisely defined categories (Achenback & Edelbrock, 1978; Curry & Thompson, 1979; Thompson & O'Quinn, 1979). A second difficulty is the small amount of studies that evaluate clinical groups from each other and discriminate normal groups from clinical groups. Third, there is difficulty in agreeing as to what is the most meaningful and scientifically acceptable method of interpreting childrens' WISC-R profiles. Kaufman's (1979) subtest scatter analysis procedure fails to statistically separate emotionally disturbed and normal children (Hale & Landino, 1981; Hirshorn & Kavale, 1976). Certain Performance-Verbal discrepancy studies suggest that depressed verbal scores may be related to the tendency of emotionally disturbed children to behave disruptively (Andrew, 1974; Dean, 1977, 1978) and other studies conclude that the Verbal-Performance discrepancy is a poor predictor of acting out behavior (Fernald & Wisser, 1967). The inconclusive results have led one team of researchers to propose the discontinued use of diagnosing LD and ED solely using the WISC-R subtest pattern or Verbal-Performance IQ differences (Vance, Singer, Kitson, & Brenner, 1983).

Reading and Math Profiles of Children with Learning Disabilities and Children with Serious Emotional Disturbances. Children with Learning Disabilities.

Reading disabilities affect approximately 2 to 10% of school age children and represent a large subpopulation of students with learning disabilities (Hynd & Cohen, 1983). Reading is the greatest area of difficulty for LD students (Hallahan & Kaufman, 1994). Phonological skills needed for word decoding mastery is the primary reading difficulty for students with learning disabilities (Foorman & Liberman, 1989; Stanovich,

1991; Vellutino, 1987). Stanovich (1991) also suggested that some students with LD have reading problems due to difficulty processing the visual information from letters. Children who acquire fluent word reading skills have improved comprehension and written language skills (Torgesen, 1989).

The ability-achievement discrepancy used to diagnose a reading disability is highly controversial. Intelligence tests have been viewed as irrelevant for the diagnosis of a reading disability (Shinn, 1989; Siegel & Ryan, 1989; Stanovich, 1991). Stanovich (1989) warns educators and psychologists not to view IQ as a measurement of someone's potential. Stanovich also implies that a child's IQ is not a predictor of his or her ability to remediate a reading disability. Siegel (1989) questioned, in four specific areas, the application of an IQ score to determine a discrepancy. He criticized the basic assumptions that "(1) IQ scores measure intelligence; (2) intelligence and achievement are independent, and the presence of an learning disability will not affect IQ scores; (3) IQ scores predict reading and/or arithmetic scores- children with low IQ scores should be poor readers and children with high IQ scores should be good readers; and (4) individuals with reading disabilities who are of different IQ levels evidence different cognitive processes and information-processing skills (Glez & Lopez, 1994 p. 155)." Researchers suggest that measuring the discrepancy between reading comprehension and listening comprehension would be a better predictor of reading potential (Aaron, 1991; Gillet & Temple, 1986; Royer, Kulhau, Lee & Peterson, 1986; Sticht & James, 1984). Studies that have compared the educational prognosis of reading disabled children based upon a discrepancy

formula as opposed to poor readers who did not meet a discrepancy criteria have provided mixed and inconclusive results (Stanovich, 1989). Siegel (1989) reported that it is difficult to find marked differences between poor readers who did, and those who did not, meet a discrepancy criterion.

Another concern raised about the role of intelligence testing in the diagnosis of a reading disability is what has been described by Stanovich (1986) as "Matthew Effects". Stanovich remarks that children who have difficulty reading have less experience with print, self esteem and motivation and therefore, a decrease IQ score is due to reading failure not cognitive weaknesses. This position was also advocated by Biemiller (1977-78) who showed that poor readers have limited vocabulary growth compared to non-reading disabled children, due to limited exposure to printed materials. Vocabulary and other word knowledge subtests on the WISC-R would be adversely affected for those who have limited exposure to reading materials, and hence a lower IQ (Biemiller, 1977, 1978; Siegel & Ryan, 1988; Vellutino, 1977,1978).

Other studies support the use of IQ testing in the diagnosis of reading disabilities. Most of the justification is centered around public policy issues (Fletcher, 1992). Fletcher indicates that one leading concern is that without an IQ-achievement discrepancy criterion an over identification of language and reading disabilities would occur. However, under identification of reading disabled children has been blamed on the current IQ-achievement discrepancy formulas being utilized (Shaywitz, Escobar, Shaywitz, Fletcher & Makuch, 1992; Stanovich, 1991). Torgesen (1989) makes an argument that IQ testing can assist in

remediation techniques. Poor readers with average IQs can take advantage of certain educational procedures that low IQ students cannot (Torgesen, Dahlem, & Greenstein, 1987). Torgesen (1988) also supports the use of intelligence tests for research purposes. Intelligence tests will assist researchers in knowing if different reading interventions used between groups of reading disabled children are effective regardless of the intellectual differences of the children.

Math problems are now recognized as the second greatest academic problem for children with learning disabilities (Hallahan & Kaufman, 1994). A study completed by Kavale & Reese (1992) demonstrated that the average math percentile score for children with LD on standardized tests was about the 30th percentile. Children with learning disabilities have difficulty with both math computation (Mercer & Miller, 1992) and math problem solving (Cawley & Parmar, 1992). Children with LD who may do poorly on math word problems may have difficulty selecting and applying problem solving strategies, and may not have problems with computational strategies (Montague & Bos, 1990). Studies have shown that children with math disabilities may have impaired fine motor and visual spatial abilities which would depress the Performance score on the WISC-R (Rourke & Finlayson, 1978; Siegel & Feldman, 1983). Children with Serious Emotional Disturbance.

There are limited studies that have investigated the achievement levels of children with ED. (Kauffman, 1993). Kauffman suggests that most children with ED are underachieving at school as measured by standardized tests. There has been an

assumption that children with serious emotional disturbances as a group have educational disabilities (Tamkin, 1960). Tamkin found that children with ED had significantly lower scores in math than reading. A follow-up study by Stone and Rowley (1964) concluded that there were significant reading and math deficits when mental age, as well as chronological age, was measured. Math scores were found to be significantly lower than reading scores. Jastak (1946) went as far to imply that children with math disabilities are at greater risk to have personality difficulties. Stroud (1956) supported Jastak's findings and concluded that children with ED are disabled in math due to a lot of missed classroom instruction. Other studies investigating ED students' academic achievement skills, however, determined more difficulty in reading and written language than in math (Badian, 1983; Gallico, 1986; Mercer, 1979; Wallace & McLaughlin, 1979).

The incidence of serious reading problems among children with ED in public schools or outpatient settings has ranged from 50 to 80% (Glavin & Annesley, 1971; Hinton & Knights, 1971; Wright, 1974). A study by Forness, Bennet & Tose (1983), that examined the achievement skills of children hospitalized for serious emotional or behavioral problems, led to the conclusion that when IQ is controlled the achievement of children with ED may not be as low as once assumed. Cullinan, Lloyd and Epstein (1981) indicated that children with serious emotional disturbances seem to have greater deficits in achievement as they grow older. In the Forness et al., (1983) study, achievement weaknesses emerged by age 9, especially in the area of math. Some reasons suggested for lower math skills included lost instructional time and retention in lower grades. Fessler et

al., (1991) studied the learning problems of 124 children with ED and stated that 37% were identified as LD and 17.8% had learning problems to impede normal rates of achievement. A greater percentage of children with ED in this study who had learning problems had difficulties in reading and written language than in math. These results did not strongly support earlier findings of other studies (Cullinan et al., 1981; Forness et al., 1983) with regard to the distribution of learning problems by age. Fessler et al., (1991) saw a decrease in learning disabilities as children increase in age and a stable incidence of learning problems across all age groups studied.

Research from criminal justice and behavior studies suggest that there is a high correlation between delinquency and school failure (Tarnopol, 1970; Reilly & Bullock, 1979). Children with delinquent behaviors have been found to have an increased incidence of learning disabilities and neuropsychological deficits (Andrew, 1974; Hathaway & Munachesi, 1963; Robbins, Beck, Pries, Jacobs, & Smith, 1983). Reilly, Wheeler, & Ettinger (1985) concluded that students with ED performed significantly better than juvenile delinquent subjects, educable mentally retarded and students with learning disabilities on the reading and spelling subtests of the Wide Range Achievement Test (Jastak, 1946).

Studies by Webster and Schenck (1978) indicate that children with serious emotional disturbances are of average intelligence, and close to grade level on reading achievement tests, but are still having problems in learning. By the age of 16, many students with ED have fallen significantly behind their peer age group in achievement

(Reilly & Bullock, 1979). Studies that have looked at educational attainment of children ED in a special class versus being in a regular class saw no advantage of one educational setting over another (Calhoun & Elliot, 1977; Carlberg & Kavale, 1980; Vacc, 1972).

Two recent studies compared children with learning disabilities and children with serious emotional disturbances on the WIAT (Psychological Corporation, 1992) and on the WJR-ACH (Woodcock & Johnson, 1989, 1990). The WIAT study revealed that children with LD and children with ED scored approximately the same on the WIAT reading and math tests. Watkins and Kush (1994) investigated the WJR-ACH test performance of students with LD and students with ED and determined that ED children performed better on both the reading and math sections. Results should be interpreted cautiously due to the small clinical sample.

Socio-cultural Factors

Socioeconomic Status (SES) and Parent Educational Level

Socioeconomic status (SES) appears to influence a child's opportunity for success in school. Many students from a low socioeconomic background experience school difficulties (Grotberg, 1970; Telegdy, 1974). Low SES has been associated with high referral rates for psycho-educational testing (Ysseldyke & Algozzine, 1981). Barona & Faykus (1992) implied that special education eligibility decisions and SES level are related. Studies suggest that low SES students are over represented in classes for mentally retarded children, while middle SES children are more likely to be found in classes for the learning disabled (Franks, 1971; Kealy & McLeod, 1976). Low SES children are over

represented in ED classes as well (Bernard & Clarizo, 1981). Children from low SES backgrounds have been found to score lower on standardized measures of intelligence than middle SES students (Minton & Schneider, 1980). Children from higher SES backgrounds score significantly higher on standardized intelligence and achievement tests than children from lower SES levels (Barona, 1989). Research that examined the relationship of socioeconomic influences and the Wechsler scales showed higher scores on the Verbal Scale in children from professional families (Seashore, 1951; Kaufman, 1976). Granier and O'Donnell (1991) provided data on the relationship between parent's education and the WISC-III. The WISC-III Full Scale Score is directly related to the parent's educational level. College graduates averaged 106, parents with some college experience averaged 101, high school graduates averaged 98, 9th to 11th grade education averaged 92, and those with less than a 9th grade education averaged 86. Children from lower SES levels scored slightly better on Performance subtests than they did on Verbal subtests and the opposite was true for children from higher SES levels (Kaufman, 1994). Kaufman (1994) states that "P > V scores for culturally disadvantaged children may suggest true intellectual ability (potential) despite inadequate learning experiences (p. 183)." Kaufman (1994) also suggests that learning environments that allow a child to utilize his strengths highlighted on the Performance section i.e., problem solving, can improve a child's chances for school success.

A study that compared low IQ scores of students in regular and special education classes concluded that students in special education classes also obtained lower SES index

scores (Rubin, Krus & Balow, 1979). Mercer (1971) stated that low SES is a predisposing factor to special education placement when IQ and achievement are held constant. The effects of SES were more relevant than the effects of race (Mercer, 1971).

A study by Telegdy (1974) that investigated school readiness of kindergarten children as measured by four frequently used readiness tests concluded that low SES students, regardless of sex, scored significantly lower than middle SES students. The results indicate that problem areas for the lower SES students were in perceptual motor integration and language comprehension.

Zill and Schoenborn (1990) studied the developmental, learning and emotional problems of children, and showed that parental education and family income had the strongest relationship for children with learning disabilities. The prevalence of learning problems decreased with the increasing years of education or increasing income. The relationship between children with emotional disturbances and family income showed significant variation among different income groups. However, children from lower income groups had the greatest chance of exhibiting emotional problems.

Gender

The relationship of sex and age as factors in special education placement indicates that males, especially younger children, are heavily over represented, not only in the initial referral process, but in special education placement as well (Bernard & Clarizo, 1981). Boys outnumber girls in special education LD classes by more than 2 to 1 (Zill & Schoenborn, 1990). Furthermore, boys are much more likely to be referred for programs

to address emotional problems, although the research suggests that there are no significant differences in the prevalence rates for childhood psychological problems for boys and girls ages 4 to 16 years (Achenbach & Edelbrock, 1981; Achenbach, Howell, Quay & Connors, 1991; Zill & Schoenborn, 1990). Clarizo and Phillips (1986) suggest that the high representation of boys in special education may reflect a sex bias in referrals by teachers. Sex bias in referrals was also noted in the higher referral rate and identification of boys for reading disabilities (Shaywitz, Shaywitz, Fletcher & Escobar, 1990). A study by McLesky (1992) that investigated the descriptive characteristics of 790 students with learning disabilities revealed that boys outnumbered girls 3 to 1 across the grade level. This study supported the male to female special education ratios found in previous large scale studies (Cone, Wilson, Bradley & Reese, 1985; Kirk & Elkins, 1975; Norman & Zigmond, 1980; Shepard & Smith, 1983). A recent study concluded that 67% of the special education referrals were males (Fugate, Clarizo & Phillips, 1993).

The concern of over representation of males in special education prompted the State of Wisconsin to convene a panel to help explain why 81% of students receiving ED services were males and 71% of students receiving LD services were males (Harmon, 1992). The panel identified five general factors to help explain the gender disparities, which were: biological differences, learned differences, different reactions of boys and girls to school, different reactions of teachers to boys in comparison to girls and, flaws or weaknesses in criteria procedures or tests. Biological differences included fewer birth defects and rapid physical maturation rates for females (Harmon, 1992). Learned

differences were primarily associated with modeling behaviors of same-sex role models and responding to societal expectations. Girls are generally more passive than boys (Harmon, 1992; McGuire, 1973) and girls respond better than boys to reinforcement provided by both male and female teachers (Jacklin, 1989). In the area of teacher reactions to boys in comparison to girls, the research suggest the greater the similarities between teacher and student, such as gender, the less likely a referral for special education will occur (Harmon, 1992). In addition, teachers are less tolerant for active learners who challenge authority and insist on explanation which is more associated with the learning style of boys (Keder-Voivodas, 1983). Some studies that have examined the flaws and weaknesses in the criteria procedures used for ED eligibility decisions focused upon the type of information provided by teachers. The studies imply that student-teacher interactions frequently determine a child's special education eligibility decision regardless of the child's academic performance (Algozzine, Schmidt & Mercer, 1981; Leinhardt, Seewald & Zigmond, 1982). Kratovil and Bailey (1986) point out that subjective information provided by teachers during an evaluation is often unreliable. Others who observe the same behavior may not agree that the behavior warrants special education intervention. Kratovil and Bailey (1986) also suggest that some teachers may refer boys for special education consideration as a classroom management tool to remove uncooperative students.

Research that has examined the achievement and ability discrepancy between males and females conclude that the magnitude of the discrepancy is the same for both boys and

girls with learning disabilities (Clarizo & Phillips, 1986). However, a study by Payette and Clarizo (1994) indicated that girls in their study had a greater chance than boys of being found eligible for LD services without a severe discrepancy being evident. Achievement levels of males and females in ED programs were found generally to be the same in a study completed by Forness et al., (1983).

Age

During the 1991-1992 school year, children in the age range of 6 to 11 represented the largest group of students with special education disabilities (15th Annual Report to Congress, 1993). Children with learning disabilities are most likely to be found eligible for special education services during grades K-5 (Cone et al., 1985; Kirk & Elkins, 1975; Norman & Zigmond, 1980). Most learning disabilities are difficult to assess until a child starts to read, write and do arithmetic (Hallahan & Kauffman, 1994; Zill & Schoenborn, 1990). However, a trend towards early identification before a child enters school has been occurring. Language and motor development are two early identification areas for a potential learning disability (Hummel, D.L & Humes, C.W., 1984).

A 1975 survey of 21 states by Kirk and Elkins found a median age at time of referral for students with learning disabilities at 8.83 years. Norman and Zigmond surveyed 22 states (1980) and identified 11.83 as the average age of referral for LD identification. The study completed by Fugate et al., (1993) revealed the average age for an LD assessment was 9.7 and the average grade placement was fourth. Payette and Clarizo (1994) reported that over 50% of students found eligible for LD services in their

study occurred during the first and second grade. Students with severe reading problems are often identified in the lower grades and students with math problems are often identified in the older grades (McLesky, 1992). Children at the end of the first grade can correctly be identified as having phonological processing deficits, often a cause for a learning disability (Hurford, Darrow, Edwards, Howerton, Mote, Schauf & Coffey, 1993). Previous studies have also shown that the older a child is identified for a learning disability the greater the discrepancy between achievement and ability (Cone et al., 1985; Norman & Zigmond, 1980; Shepard & Smith, 1983).

The research on the age and grade range of children receiving ED services is less clear and not as available due to the lack of clarity with the ED definition (Kauffman et al., 1987). A study by Valdes (1990) reports that the greatest percentage of students receiving ED services were students 6 to 12 years of age. Zill and Schoenborn (1990) report that emotional and behavioral problems can occur at any age, and the rates of emotional and behavioral problems seem to increase fairly steadily with age. Parents reported in the Zill and Schoenborn study that most emotional problems emerged during the preschool years and during the early elementary years. The median age which chronic emotional problems were noticed was 7 years 2 months.

Family Composition

Family structure has been investigated for its importance to better understand the unique characteristics of students with disabilities. Previous research has demonstrated

that children in single parent families are at greater risk of developing emotional and academic difficulties than those from two parent families (Emery, 1988; McLanahan, 1988). Zinn and Schoenborn (1990) suggests that single family homes tend to have lower educational and income levels than two parent homes which can contribute to school difficulties. Furthermore, Zinn and Schoenborn (1990) report that children in step families are also at greater risk of maladjustment and school failures. Father absence and family size appear to influence a child's performance on achievement and intelligence tests (Blanchard & Biller, 1971; Falbo, 1977; Kohlberg, 1966; Marjoribanks, 1972; Sutton-Smith, Rosenberg & Landy, 1968; Zajonc, 1976). Barona and Faykus (1992) concluded that father absence from home and family size did not significantly contribute in the special education eligibility decision. A study by Barona, Barona and Faykus (1993) that measured the effects of socio-cultural variables on LD placements concluded family size and father absence are not important when intelligence factors are correctly adjusted for.

Personality and behavior patterns of parents have been recognized as strong predictors of their child's behavior. Family patterns that include the disintegration of the family increase the risk of aggressive adolescent behavior (George & Main, 1979; Stewart, Adams, & Mewdon, 1978; Werner & Smith, 1979). Studies of juvenile delinquents suggest that the absence of a father has been related to the prevalence of delinquency (Blakely, Stephenson & Nichols, 1974).

Service Delivery Models

The Individuals with Disabilities Education Act (1990) requires that children with disabilities be taught in the least restrictive environment. Specifically, it requires that children with disabilities are educated with non disabled children to the maximum extent appropriate. Furthermore, it requires that children only be removed from regular classes when the condition of their disability does not offer the student the opportunity to benefit from regular classes (34.C.F.R Sec. 300.550). The regulations also require that a continuum of alternative placements be available to meet the needs of individual students which includes regular classes, special classes, special schools, home instruction, hospitals and institutions (Hasazi, Johnston, Ligget & Schattman, 1994). The goal to educate students with disabilities in regular classroom settings has been a source of controversy (Fuchs & Fuchs, 1991; Kauffman, 1989; Stainback & Stainback, 1992).

There has been an emerging consensus that students with mild learning and emotional disabilities can be taught effectively in regular classroom settings (McLesky & Pacchiono, 1994). A greater agreement exists that students with learning disabilities should be taught most of the day in a regular education program (Carlberg & Kavale, 1980; Epps & Tindale, 1987; Leinhardt & Pally, 1982; Madden & Slavin, 1983). A review of the Annual Reports to Congress on the Implementation of PL. 94-142 from 1979-1989 indicated that, in 1989, 98.5% of students with learning disabilities were either taught in a regular classroom, resource room or a separate class (McLeskey & Pacchiano, 1994). McLeskey and Pacchiano also report that the percentage of students with learning

disabilities taught in either the regular classroom or a resource program have ranged from 76.8 to 81.1 during the same time period.

Although most students with learning disabilities are taught within the regular classroom or resource program, a higher percentage of students with serious emotional disturbances are taught outside the regular classroom (Hallahan & Kaufman, 1994). Students with behavior disorders are often ranked as the most difficult to teach and are considered less acceptable in regular educational settings and classrooms (Slate & Saudargas, 1986; Walker, Stevens, Todis, Block-Pedego, Williams, Haring & Barckley, 1990). Delivery of special education services for children with emotional disturbances is more complex, because of inconsistencies in the definition and identification measures (Council for Children with Behavioral Disorders, 1987; Forness, 1988).

A study by Kauffman, Cullinan and Epstein (1987) examined the relationship of IQ and academic performance of students with serious emotional disturbances, and the service delivery model in which they were taught. They concluded that intelligence and achievement levels were not clearly linked to placement. Although there was a trend for students with higher IQs to be mainstreamed more often than lower IQ students, other undefined factors seem to better explain the placement decision. Barack (1986) suggests that males with serious emotional disturbances are over represented in more restrictive educational and psychiatric environments.

Summary

In this chapter an attempt was made to review the literature pertaining to the intellectual, academic achievement and demographic profile of students with learning disabilities (LD) and students with serious emotional disturbances (ED). The beginning of the chapter introduced the research surrounding the identification and evaluation procedures to determine if a student is eligible for special education services for a learning disability or serious emotional disturbance. The scope is broadened with the introduction of literature addressing the instruments most often used to assess the intellectual, reading and math skills of learning disabled and seriously emotionally disturbed students, and the intelligence and achievement profiles of learning disabled and seriously emotionally disturbed students. The literature review of important demographic and family variables that may be unique to learning disabled and seriously emotionally disturbed students followed the literature review on intelligence and academic achievement. The latter part of the chapter explored some of the research pertaining to the educational placements of students with learning disabilities and students with serious emotional disturbance.

Chapter 3

METHODOLOGY

This study investigated the relationships between intelligence, reading and math abilities, and selected demographic information of students identified with a learning disability (LD) and students identified with a serious emotional disturbance (ED). Specifically, this study sought to determine if students with learning disabilities and students with serious emotional disturbances can be separated from each other by their IQ profiles, reading and math skills, gender, family composition, parent's educational level, current grade placement, age referred for a special education evaluation, and their current age. In addition, this study examined if these variables can discriminate between the special education delivery service model for students with learning disabilities (resource or self contained) and students with serious emotional disturbances (resource and self contained, which included students in the day treatment program).

The following research statements guided this study:

- 1) There will be no differences among students with a learning disability and students with a serious emotional disturbance using the Verbal, Performance and Full scale IQ scores on the WISC-III.
- 2) Students with a serious emotional disturbance will score higher than students with a learning disability using the standardized reading and math scores from individually administered achievement tests.

- 3) Students with learning disabilities will score lower on verbal comprehension and vocabulary subtests on the WISC-III than students with serious emotional disturbances.
- 4) There is a cluster of intellectual, educational and demographic variables that discriminate between the learning disabilities and serious emotional disturbances classification.
- 5) There is a cluster of intellectual, educational and demographic variables that discriminate the service delivery model for students with a learning disability and students with a serious emotional disturbance.

Participants

The special education confidential files of students currently enrolled in programs for the learning disabled and serious emotionally disturbed in three school systems located in the Northern Shenandoah Valley Region of Virginia were analyzed. Three hundred and one files of students with learning disabilities and 99 files of students with serious emotional disturbances in grades K through 12 were analyzed for the study. Records of students with a dual diagnosis of LD and ED or any other secondary disability were excluded from this research. The three school systems together had approximately 885 learning disabled students and 119 emotionally disturbed students. The distribution of students selected for the research presented in Tables 1 and 2 was generally representative of their numbers as they existed at the time of the research in the programs for students with emotional disturbances or learning disabilities.

Table I**Chronological Age of Subject**

Age Distribution of Sample				
Age	Count	Cumulative Count	Percent	Cumulative Percent
07	14	14	3.50	3.50
08	39	53	9.75	13.25
09	39	92	9.75	23.00
10	37	129	9.25	32.25
11	35	164	8.75	41.00
12	36	200	9.00	50.00
13	53	253	13.25	63.25
14	43	296	10.75	74.00
15	49	345	12.25	86.25
16	22	367	5.50	91.75
17	22	389	5.50	97.25
18	11	400	2.75	100.00
Missing	0	400	0.00	100.00

Table 2

Grade Level of Subjects

Grade Distribution of Sample				
Grade	Count	Cumulative Count	Percent	Cumulative Count
01	4	4	1.00	1.00
02	21	25	5.25	6.25
03	44	69	11.00	17.25
04	45	114	11.25	28.50
05	28	142	7.00	35.50
06	47	189	11.75	47.25
07	46	235	11.50	58.75
08	53	288	13.25	72.00
09	46	334	11.50	83.50
10	35	369	8.75	92.25
11	21	390	5.25	97.50
12	7	397	1.75	99.25
Missing	3	400	0.75	100.00

The three participating school systems are located in communities that share common boundaries and are part of the same planning district. The total population from the three jurisdictions in 1993 was 84,600 (Lord Fairfax Planning District Commission, 1993). The 1993-1994 end of year total student membership for the three school systems was 13,712 (Superintendent's Annual Report for Virginia, 1994).

According to the 1993 Lord Fairfax Planning District Commission Report (LFPDC), residences of the three jurisdictions share characteristics similar to both rural and urban areas. Common characteristics among the three jurisdictions include the percentage of high school graduates or higher (68.8 to 75) and the percentage of families below the poverty level (4.7 to 6.9). The three localities share a regional library, hospital, airport, community college, disability services board, emergency services council, food bank, health district, small business development center, soil and water conservation district, community services board, 4H center and agency on aging. The three school systems share a regional vocational center and regional special education program which is governed by a joint board of control.

The three school systems selected for this study follow identical procedures to identify students with learning disabilities and to identify students with serious emotional disturbances. Students identified for a learning disability need to demonstrate a severe discrepancy of approximately one standard deviation (15 points) between achievement and ability. Students who qualify for special education services for a serious emotional disturbance are found eligible based upon the criteria outlined in the Virginia Special

Education Regulations (1994). All students are found eligible for special education services by a multi-disciplinary eligibility committee which includes a school psychologist, school social worker or visiting teacher, educational diagnostician, medical professional, special education teacher, teacher, principal and special education administrator or designee. Evaluations are completed by personnel who meet the licensure requirements set by the Virginia Department of Education.

The three school systems were also selected for this study because they have the same service delivery models for students with learning disabilities and students with serious emotional disturbances. Resource (less than 50% in special education) and self contained (50% or greater in special education) programs for students who are learning disabled, or students who are seriously emotionally disturbed, and a separate day school program for students who are seriously emotionally disturbed are available at all grade levels. The separate day school program is a more intensive psycho-educational program which is shared among the three school systems.

Instrumentation

The Wechsler Intelligence Scale for Children - Third Edition (Wechsler, 1991), Kaufman Test of Educational Achievement (Kaufman & Kaufman, 1985), Woodcock Johnson Test of Achievement (Woodcock & Johnson, 1989, 1990) and the Wechsler Individual Achievement Test (Psychological Corporation, 1992) provided the standardized data for this study. These instruments are frequently used as part of an

evaluation to determine a learning disability or serious emotional disturbance. A complete review of the psychometric properties of these instruments can be found in Chapter Two.

Data Collection Process

Permission to review the files was obtained from the Superintendent or his designee for approving research for the school district (see appendix A 1). All files were reviewed in an area designated by the school systems and no identifying information was documented in order to guarantee confidentiality.

Data collected were from the most current evaluations completed by qualified and licensed school personnel (school psychologist, educational diagnostician and school social worker) employed by the three participating school systems. The psychological reports or eligibility minutes provided the WISC-III Full, Verbal and Performance IQ scores, subtest standard scores, and significant Verbal and Performance discrepancies of 15 points or greater. Educational reports were reviewed to obtain standard age scores in reading and math. Other data such as gender, age, age at time of special education referral, parent's educational level and current grade level were collected from the socio-cultural report or other appropriate reports located in the confidential file. Current educational placement or service delivery model was determined by the most recent individualized educational plan (IEP) located in the confidential files.

Data Analysis

Each student was given a code to assure anonymity. Standard scores from the WISC-III, K-TEA, WJR-ACH and WIAT together with the demographic and descriptive data was analyzed using the Statistica (Release 5) program. T- tests were performed to determine differences between the means of students with learning disabilities and students with serious emotional disturbances. Specifically, the mean IQ scale scores and the mean vocabulary and comprehension subtest scores of the LD and ED students were compared for differences. In addition, the mean reading and math standard scores of the LD and ED students were compared for differences.

A discriminant analysis technique was employed to analyze appropriate variables simultaneously to help discriminate among LD and ED students and to predict group membership. Furthermore, separate discriminant analyses were used to discriminate between the service delivery models for LD students (resource and self contained) and for ED students (resource and self contained). The level of significance to determine whether or not differences exist between or among the various subsamples will be set at .05.

Chapter 4

RESEARCH RESULTS

This chapter provides a review of the sample, statistical methods and statistical results utilized to respond to the five research statements posed in Chapter I of this document. Furthermore, this chapter provides a descriptive review of the entire sample and a description of the studied characteristics specific to the LD and ED sample. The five research statements investigated were the following:

- 1) There will be no differences among students with a learning disability and students with a serious emotional disturbance using the Verbal, Performance and Full scale IQ scores on the WISC-III.
- 2) Students with a serious emotional disturbance will score higher than students with a learning disability using the standardized reading and math scores from individually administered achievement tests.
- 3) Students with learning disabilities will score lower on verbal comprehension and vocabulary subtests on the WISC-III than students with serious emotional disturbances.

- 4) There is a cluster of intellectual, educational and demographic variables that discriminate between the learning disabilities and serious emotional disturbances classification.
- 5) There is a cluster of intellectual, educational and demographic variables that discriminate the service delivery model for students with a learning disability and students with a serious emotional disturbance.

Description of the Sample

Demographics

A total of 400 special education records were reviewed in the study. Of the 400 records reviewed, 301 were records of children with learning disabilities (LD) and 99 were records of children identified as emotionally disturbed (ED). Table C 1 (Appendix C) presents a list of all of the variables, and their assigned values, that were collected on each student.

Student Characteristics

A breakdown of selected demographic descriptors of this sample can be found in Table 3. It indicates that the mean age of the students in the study was 12.2 and the mean age of when students were referred for special education testing was 7.8. The mean grade level of the students in the sample was 6.5. Furthermore, a larger percentage of the

sample were males (306 males to 94 females) as one would expect given the higher ratio of males to females in the general population of students with learning disabilities and serious emotional disturbances. Table 3 also provides a specific breakdown of the above student characteristics by the diagnosis of LD and ED.

Family Characteristics

The educational mean grade level of the parents and family characteristics are presented in Table 4 . With the exception of 12 records, the parent's educational levels were available. The mean parent educational grade level was 12. Parents who had an educational grade level of 12 (high school graduate or GED) were the most representative of the sample (53%). Parents who had not obtained a high school or a general educational diploma (GED) represented 25.2% of the total group. The greatest percentage of students (48.5%) were residing with their natural parents. Students living with a single parent (27.5%) or living with a biological and step parent (16.2%) were representative of 43.7% of the sample. The remaining 7.7% of the students either resided with other relatives or foster placements. Table 4 also displays the above characteristics specifically for the two disability groups.

Table 3**Demographic Descriptors of Subject**

SAMPLE DATA BY SUBJECT						
	All Students		LD Students		ED Students	
Descriptors	N	%	N	%	N	%
SEX						
Male	306	76.5	227	75.41	79	79.79
Female	94	23.5	74	24.58	20	20.20
AGE						
Mean		12.24		11.98		13.03
Minimum		7.00		7.00		7.00
Maximum		18.00		18.00		18.00
Standard Deviation		2.93		2.96		2.73
CURRENT GRADE LEVEL						
Mean		6.56		6.27		7.44
Minimum		1.00		1.00		1.00
Maximum		12.00		12.00		12.00
Standard Deviation		2.71		2.74		2.45
AGE REFERRED FOR TESTING						
Mean		7.88		7.80		8.13
Minimum		3.00		3.00		4.00
Maximum		15.00		15.00		14.00
Standard Deviation		2.17		2.07		2.45
AGE WHEN LAST TESTED						
Mean		10.56		10.42		11.33
Minimum		5		6		5
Maximum		17		16		17
Standard Deviation		2.81		2.74		2.92

Table 4
Family Characteristics of Subject

SAMPLE DATA BY SUBJECT						
	All Students		LD Students		ED Students	
	N = 388		N = 299		N = 89	
Parental Educational Level						
Mean Grade Level	12.0		12.1		11.5	
Standard Deviation	2.3		2.4		2.0	
Family Composition						
	N	%	N	%	N	%
Natural	194	48.5	175	58.1	19	19.1
Single	110	27.5	67	22.2	43	43.4
Step	65	16.2	49	16.2	16	16.1
Other	31	7.7	10	3.3	21	21.2

Psycho-educational Characteristics

The intellectual and achievement characteristics for the sample are provided in Table 5. Verbal, Performance and Full Scale IQ scores of the WISC-III were located in 394 of the 400 student files researched. The mean Verbal, Performance and Full Scale IQ scores for the sample were 92.2, 92.8 and 91.7, respectively. The normed means for the WISC-III is 100. Significant Verbal > Performance IQ score differences of 15 or more points were revealed on only 12% of the sample. Likewise only 15% of the sample had significant Performance > Verbal IQ score differences. The reading and math composite standard scores were received from all students, with the exception of one. The mean reading score was 88.0 and the mean math score was 91.4.

Table 5**WISC-III Scale Scores and Educational Data**

SAMPLE DATA BY SUBJECT			
	All Students	LD Students	ED Students
	N = 394	N = 301	N = 93
Mean Verbal IQ	92.2	92.8	90.3
Standard Deviation	14.0	13.8	14.7
Mean Performance IQ	92.8	92.8	92.8
Standard Deviation	14.0	13.8	14.5
Mean Full Scale IQ	91.1	92.0	90.7
Standard Deviation	13.2	12.9	14.5
	Mean Score	Mean Score	Mean Score
Information	8.4	8.4	8.4
Similarities	9.1	9.2	8.7
Arithmetic	7.9	8.0	7.8
Vocabulary	8.5	8.6	8.0
Comprehension	8.8	9.0	8.1
Digit Span	7.9	7.8	8.4
Picture Completion	9.0	8.9	9.5
Coding	8.3	8.3	8.6
Picture Arrangement	8.9	8.9	8.7
Block Design	8.7	8.8	8.7
Object Assembly	8.9	8.9	8.7
Reading SS			
Mean	88.0	86.3	93.0
Standard Deviation	15.4	14.4	17.0
Math SS			
Mean	91.4	91.2	92.0
Standard Deviation	14.5	14.5	14.8

Service Delivery Model Characteristics

Descriptions of the student, family and psycho-educational characteristics of the specific service delivery models for the LD students (resource and self contained) and ED students (resource, self contained and day treatment) are provided in Table 6. At the time of the study, 80.3% of the LD students in the sample were in resource programs and 19.6 % were being taught in self contained programs. The percentage of ED students taught in resource models was 32.2, self-contained 35.3 and day program 32.3. Overall, the parent's educational grade level, the student's WISC-III scale scores, and the reading and math scores were higher for LD children in resource programs than LD children in self contained settings. All other characteristics for LD students being taught in either a resource or self contained model were similar. Table 6 goes on to show that ED students being taught in a resource model have higher IQ, reading and math scores than students being taught in a self contained or day treatment model. In addition, the mean educational grade level for parents of students in a resource model was approximately one and a half years higher than parents of students being taught in a day treatment program.

Table 6**Selected Service Delivery Model Characteristics**

SAMPLE DATA BY MODEL			
LD Students	Resource N = 242	Self Contained N = 59	
MEAN SCORES			
age	11.8	12.3	
age referred	7.8	7.5	
parent's ed. level	12.4	10.8	
verbal IQ	95.2	83.0	
performance IQ	94.6	85.3	
full scale IQ	94.3	82.6	
reading ss	88.7	76.7	
math ss	93.2	83.0	
ED Students	Resource N = 32	Self Contained N = 35	Day Program N = 32
MEAN SCORES			
age	14.1	11.6	13.4
age referred	8.3	7.7	8.3
parent's ed. level	12.0	11.3	10.9
verbal IQ	97.9	86.4	87.2
performance IQ	98.6	91.1	89.1
full scale IQ	98.0	87.5	87.0
reading ss	100.4	89.2	89.9
math ss	97.9	90.2	88.7

NOTE: means for nonmissing cases

Relationship of the Variables

To gain a better understanding of the sample and the relationships between the WISC-III scale scores, demographic and educational variables, a Pearson Product-Moment Correlation analysis was performed as presented in Table C 2 in Appendix C. A pairwise deletion of missing data approach was used so that each correlation would be computed from all subjects that have complete data for the respective pair of variables.

Significant correlations with the disability diagnosis variable (LD or ED) included the program model (resource and self contained), student's age, age tested, family composition, (intact and non-intact) parent's educational level, grade level, WISC-III comprehension subtest score and reading skills. The program model variable revealed some interesting correlations with other variables. Significant correlations with the program model variable suggested that children with lower IQ and achievement scores were taught in more restrictive environments e.g., self contained. Furthermore, children who resided in an intact family environment and had parents with higher educational levels received less special education services.

Family variables revealed relationship trends that would be expected. Specifically, a significant positive correlation was found between a parent's educational level and a child's performance on the WISC-III and achievement tests.

To better understand the relationships of the variables mentioned above, correlations were computed using the same procedures and $p < .05$ significant level for the LD sample and ED sample provided on Tables C 3 and C 4 in Appendix C. The overall

trend of the significant correlations was similar for the LD and ED students.

The special education services that a child received was significantly correlated with the parent's educational level, WISC-III scale scores and academic achievement standard scores. The higher the parent's educational level and the student's intellectual and achievement scores, the less special education services the student required.

Correlations were also completed for the individual service delivery models for each disability group. The correlations for the self contained group should be interpreted cautiously due to the small sample size. Generally, the same trends exist for the resource group as for the overall sample and the total LD sample. Interestingly, the self contained sample did not reveal significant correlations between the parent's educational level and the student's performance on the IQ or achievement tests. Like the LD self contained group, important significant correlations were not identified within the different ED service delivery models. The exception was a positive correlation between a parent's educational level and a child's reading skills for the self contained group. The lack of significant correlations may be a function of the small sample size and not the absence of significant variable relationships.

Response to Research Statements

Statement One

There will be no differences among students with a learning disability and students with a serious emotional disturbance using the Verbal, Performance and Full scale IQ scores on the WISC-III.

To answer this statement three separate independent t-tests were performed. Tables 7, 8, and 9 present comparisons of the Verbal, Performance and Full Scale IQ means of the LD and ED students. At the .05 level of significance, the means were not significantly different for any of the three Scale IQ scores. The results of the three independent t-tests failed to show any significant differences between the IQ scale scores on the WISC-III among LD and ED students. The null hypotheses statement was supported.

Statement Two

Students with a serious emotional disturbance will score higher than students with a learning disability using the standardized reading and math scores from individually administered achievement tests.

Two separate independent t-tests were utilized to respond to this statement. As presented in Table 10, students with a serious emotional disturbance scored significantly

higher than students with learning disabilities when comparing the mean reading composite scores ($t = - 3.80, p < .01$) at the .05 level of significance. The mean reading composite score for LD students was 86.3 and for ED students 93.0. In comparing the mean math composite scores provided in Table 11, we see that there was no significant difference among the LD and ED students.

The results of the two independent t-tests indicate that reading skills of LD students, as measured on standardized reading instruments, were significantly lower than the reading skills of ED students. However, the math skills, as measured by individually administered achievement tests, were evenly developed.

Table 7

Comparison of WISC-III Verbal IQ for the LD and ED Students

	Mean LD	Mean ED	T-Value	DF
Verbal IQ	92.85382	90.37634	1.485413	392
P	Std Dev LD	Std Dev ED	F-Ratio Variance	P Variance
.138238	13.84817	14.72348	1.130409	.444964

Table 8

Comparison of WISC-III Performance IQ for the LD and ED Students

	Mean LD	Mean ED	T-Value	DF
Performance IQ	92.81728	92.89247	-.045074	392
P	Std Dev LD	Std Dev ED	F-Ratio Variance	P Variance
.964072	13.89760	14.58667	1.101623	.543125

Table 9

Comparison of WISC-III Full Scale IQ for the LD and ED Students

	Mean LD	Mean ED	T-Value	DF
Full Scale IQ	92.07641	90.70968	.866172	392
P	Std Dev LD	Std Dev ED	F-Ratio Variance	P Variance
.386925	12.90959	14.50081	1.261711	.151353

Table 10

Comparison of Reading Standard Scores for the LD and ED Students

	Mean LD	Mean ED	T-Value	DF
Reading	86.39535*	93.09184*	-3.80050*	397*
P	Std Dev LD	Std Dev ED	F-Ratio Variance	P Variance
.000167*	14.47802*	17.06210*	1.388821*	.038713*

Table 11

Comparison of Math Standard Scores for the LD and ED Students

	Mean	Mean		
	LD	ED	T-Value	DF
Math	91.21595	92.25510	-.612483	397
	Std Dev	Std Dev	F-Ratio	P
P	LD	ED	Variance	Variance
.540569	14.50344	14.84651	1.047867	.755077

Statement Three

Students with learning disabilities will score lower on verbal comprehension and vocabulary subtests on the WISC-III than students with serious emotional disturbances.

An independent t-test was used to compare the mean verbal comprehension subtest scores on the WISC-III as presented on Table 12. Students with learning disabilities scored significantly higher than students with serious emotional disturbances ($t = 2.46, p = .014$). The mean subtest score for LD students was 9.0 and 8.1 for ED students.

The vocabulary subtest mean scores on the WISC-III verbal section were compared by an independent t-test shown on Table 13. The results revealed no significant difference among LD and ED students on this subtest.

In contrast to the research statement, the results revealed that LD children do not score lower than ED children on subtests that measure language development (vocabulary and comprehension). The LD children scored significantly higher than the ED children on the verbal comprehension subtest.

Table 12**Comparison of the WISC-III Comprehension Subtest for LD and ED Students.**

	Mean	Mean		
	LD	ED	T-Value	DF
Comprehension	9.096346*	8.144444*	2.464938*	389*
	Std Dev	Std Dev	F-Ratio	P
P	LD	ED	Variance	Variance
.014135*	3.167652*	3.367262*	1.130001*	.451086*

Table 13

Comparison of the WISC-III Vocabulary Subtest for ED and LD Students.

	Mean	Mean		
	LD	ED	T-Value	DF
Vocabulary	8.641196	8.033333	1.754755	389
	Std Dev	Std Dev	R-Ratio	P
P	LD	ED	Variance	Variance
.080089	2.814989	3.102916	1.215029	.234093

Statement Four

There is a cluster of intellectual, educational and demographic variables that discriminate between the learning disabilities and serious emotional disturbances classification.

A discriminant function analysis was used to determine which variables discriminate between the LD and ED groups. All variables were assigned values to meet the continuous variable requirements necessary to run a discriminant function analysis. The service delivery model variable was excluded from the analysis due to its high correlation with the disability variable. Table C 5 in Appendix C provides the results of the discriminant analysis. Variables that discriminated at the statistical significance level of $p < .05$ between LD and ED students included family composition, grade level, picture completion subtest, coding subtest, picture arrangement subtest, block design subtest, reading skills and $P > V$ IQ. Table C 6 in Appendix C 6 provides a factor structure matrix of the pooled within-groups correlations of the variables with the respective discriminant function. This analysis helped to explain the partial correlation between the variables and the entire cluster. The identified discriminating variables that appeared to have correlations of importance with the entire function were family composition (.611), grade level (-.315) and reading (-.322). Table 14 illustrates predicted group memberships. Based on the discriminant function, the LD classification could be predicted with 92.3% accuracy and 39.3% accuracy for ED students. Table C 7 in Appendix C provides means for the discriminant function. The function had a positive relationship for the LD students and a negative relationship for the ED students.

Table 14

Classification Matrix for LD and ED Membership

Classification Matrix Rows: Observed Classifications Columns: Predicted Classifications			
Group	Percent Correct	LD p=.75250	ED p=.24750
LD	92.35	278	23
ED	39.39	60	39
Total	79.25	338	62

In summary, the discriminant analysis procedure revealed a cluster of intellectual, educational and demographic variables that discriminate among the LD and ED classification.

Statement Five

There is a cluster of intellectual, educational and demographic variables that discriminate the service delivery model for students with a learning disability and students with a serious emotional disturbance.

Two separate discriminant analyses were run to determine which variables discriminate between the LD service delivery models (resource and self contained) and which variables discriminate between the ED service delivery models (resource and self contained). ED students receiving services in the day treatment program were grouped in the self contained model. All variables were assigned values to meet the continuous variable requirements necessary to run a discriminant function analyses. The results of the ED analysis should be interpreted cautiously due to the smaller sample size. Table C 8 in Appendix C provides the results of the LD discriminant analysis. Variables that successfully discriminated between resource and self-contained models were statistically significant at the $p < .05$ level.

Table 15

LD Service Delivery Model

Classification Matrix			
Rows: Observed Classifications			
Columns: Predicted Classifications			
Group	Percent Correct	Resource p = .80399	Self Con p= .19601
Resource	96.28	233	9
Self contained	38.98	36	23
Total	85.04	269	32

Family composition, student's grade level, similarities subtest and reading skills were identified as discriminant variables. Table C 9 in Appendix C displays a factor structure matrix of the pooled within-groups correlations of the variables with the respective discriminant function. Only the reading variable (.591) and the similarities subtest (.637) seemed to have a correlations of significance with the entire function . The predicted classification of the service delivery model based on the discriminant function is provided in Table 15. Students in a resource model were classified correctly at 96.2% and students in a self-contained model were classified accurately at 38.98%. Table C 10 in Appendix C provides the means for the discriminant function. The resource model had a negative relationship with the function and the self-contained had a positive relationship.

The results of the discriminant analysis for the ED service delivery models are provided on Table C 11 in Appendix C. Variables that successfully discriminated between students receiving less than 50% of special education services (resource) and students receiving more than 50% (self contained) for the ED students at $p < .05$ level were age tested, parent's educational level, performance and full scale IQ, vocabulary subtest, block design, and V>P IQ. Table C 12 in Appendix C provides the pooled-within-groups correlations for the identified discriminant function.

A comparison of the significant discriminating variables with the factor structure matrix of the pooled within group correlations function revealed that the full scale IQ (-.350) and the block design subtest (-.345) were discriminators that had correlations of significance with the respective function. The function was negatively correlated with the resource group and positively correlated with the self contained group as presented in Table C 13 in Appendix C. The classification predictions highlighted in Table 16 indicated that both groups had high classification accuracy based upon the function. The predicted classifications for the self contained group were higher than the resource group.

In summary, the results of the discriminant analyses indicated a cluster of variables that can discriminate among the different service delivery models for LD and ED students.

Table 16

ED Service Delivery Model

Classification Matrix			
Rows: Observed Classifications			
Columns: Predicted Classifications			
Group	Percent Correct	Resource p=.32323	Self Con p=.67677
resource	71.87500	23	9
self cont	95.52238	3	64
Total	87.87878	26	73

Chapter 5

CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS

This chapter includes major conclusions to be drawn from the research, a discussion of the potential implications, and recommendations for future research. Since this sample was specific to a limited geographic area, inferences made to a larger population should be done cautiously.

The focus of this study was to examine the intellectual, educational and demographic data collected by multi-disciplinary teams to determine a student's eligibility for special education services due to a learning disability (LD) or a serious emotional disturbance (ED). Specifically, this study researched the following areas: 1) Determining if there were intellectual and achievement differences between LD and ED students based upon the results of individually administered intelligence and achievement tests. 2) Determining if a cluster of intellectual, educational and demographic variables can discriminate between LD and ED students. 3) Determining if a cluster of intellectual, educational and demographic variables discriminate among the different special education environments in which these students were taught. Variables that were selected for this study were highly objective, reliable and valid. As presented in the delimitations section in Chapter One, data that lacked objectivity or adequate reliability were excluded.

Conclusions

The following conclusions were drawn for this sample of learning disabled and seriously emotionally disturbed students:

1) Research statements one and two compared the mean score differences of the WISC-III scale scores and the reading and mathematics standard scores (WIAT, K-TEA and WJ-ACH) among LD and ED students. The findings indicated that the Verbal, Performance and Full Scale IQ scores of LD and ED students were statistically similar. These findings were similar to previous research that showed an absence of a WISC scale pattern that can differentiate LD from ED children (Hale & Landino, 1981; Watkins & Kush, 1994).

The mathematics standard scores of the LD and ED students were statistically the same. However, the reading standard scores were significantly higher for the ED students. This should not be of great surprise, considering that for a child to be found eligible for LD services a significant discrepancy between intelligence and achievement must exist. Furthermore, recent research suggests that 80-90% of all children classified as learning disabled have reading difficulties (Palincsar & Perry, 1995). Reading problems are the primary cause for a learning disability evaluation (Witt and Bartlett, 1982). A potential reason why the mathematics scores were similar may be related to the age in which children were first identified for special services. The average age a student was referred was approximately 8 years old. As mentioned in the research section, children referred during the early elementary school years are primarily experiencing reading

difficulties. Older children are more often referred for mathematics weaknesses.

2) Research statement three further investigated two of the WISC-III Verbal subtests (vocabulary and comprehension) that have a strong association with school achievement (Kaufman, 1994). It was hypothesized that LD children would score lower than ED children on these two subtests. The results of this study did not support the research hypotheses. In fact, the LD students scored significantly higher on the comprehension section than the ED children. Although this was in contrast to what was expected, the results do highlight some clinical significance. The comprehension subtest not only measures verbal comprehension and language development, but it also measures social adjustment (Kaufman, 1994) and an individual's acceptance of social mores (Sattler, 1992). These are two factors that may be deficient in students identified as ED. A criticism of intelligence tests is that it often fails to measure a child's social common sense and social awareness (Brown, 1994). The WISC-III verbal comprehension subtest may not adequately assist the evaluator in sorting out if a child's performance on this subtest is a measure of verbal ability or a measure of social intelligence.

3) Research statement four investigated intellectual, educational and demographic variables simultaneously to determine which variables can successfully discriminate between LD and ED students. The family composition and reading skills of the student seem to be the variable of diagnostic importance. These findings are supported when we consider that 58% of the LD sample resided with their natural parents compared to only

19% of the ED. Furthermore, 21% of the ED students were living in either foster placements or with other relatives in comparison to 3% of the LD students. Living with a single parent was the most common family structure for ED students (43%).

The reading differences between ED and LD students were previously discussed. The approximate 9 point reading difference between the two disability groups demonstrated that reading standard scores were a significant discriminant variable. Although the analysis indicated that some subtests on the Performance Scale IQ section were statistically significant discriminators of the two groups, a review of the mean scores for those subtests (picture completion, coding, picture arrangement and block design) do not support any functional significance. In all cases the mean differences were less than one point.

4) Research statement five examined the intellectual, educational and demographic variables simultaneously to determine which variables can discriminate successfully the different service delivery models for LD and ED students. The results of the LD group are more reliable than the ED group due to the sample size differences.

Reading skills were determined to be the most significant discriminator among the two LD service delivery models. Students taught in the more restrictive environment (self contained model) scored approximately 12 points lower than students taught in a resource model. The reading ability of an LD child was a strong predictor of the level of services received. The findings revealed also that students in a resource model were placed more precisely than students in the self contained model based upon the discriminant function.

This may signify that the placement decision of students who have a self contained profile may be influenced by other factors not related to the assessment procedure. This will be discussed in greater detail later in the service delivery section of this chapter.

The discriminant analysis results for the ED resource and ED self contained service delivery models revealed that the WISC-III Performance and Full scale IQ scores were significant discriminators. Students enrolled in an ED program for more than 50% of the school day averaged 8 points lower on the Performance IQ scale and 11 points lower on the Full IQ scale than students in resource programs. In addition, students in the resource programs scored close to three points higher on the block design subtest than students in the self contained models (more than 50%). Although intellectual and demographic variables were identified as discriminators, an inconsistent pattern develops when comparing the three service delivery models. A clear trend was not established that could separate the three groups by the continuum of restrictiveness (resource, self contained, day program). The block design subtest, a task that measures visual motor coordination, was the only discriminating variable that showed a pattern correlated with the continuum of restrictiveness. The mean scores on the block design subtest were 10.4, 8.2 and 7.7, respectively. However, students who received less than 50% special education services overall had higher IQ and achievement scores than the students taught in models that required more than a 50% level of special education services. In addition, the mean parental educational level of ED resource students was above a high school diploma level, which was not true for the other two groups. Although the classification predictions were

generally accurate based upon the discriminant functions, the results do imply that other factors are contributing to the service delivery model decision.

Discussion

The reader is encouraged to review the limitations, delimitations and working definition of terms supplied in Chapter 1 to understand the features of this study which provide the context in which these data should be interpreted. For example, the major criteria for a student to be found eligible for LD services in the three participating school systems was a significant discrepancy of approximately 15 points (one standard deviation) between intelligence and achievement. Another area that needs to be emphasized was this researcher's attempt to include only data that had a high degree of reliability and objectivity. Furthermore, the data selected to be analyzed were consistently available from the three participating school systems and typical of what would be found in a special education evaluation. Reading and mathematics standard scores were selected from one of three instruments in order to insure inclusion of these data. The validity of these three instruments was good and should not restrict the interpretations of the results. This type of research is often limited because of issues surrounding confidentiality, access to psycho-educational data and school official's concerns about the intrusiveness and time demands of such research on their staff. Fortunately, these limitations did not exist in this research. Within this framework, the following section offers a discussion of the impact the major variables within this study had on the diagnosis of a learning disability or serious emotional disturbance and the special education environments in which the subjects were taught.

Intelligence Testing

The use of the WISC-III, the most widely used intelligence test, seems to have limited effectiveness in trying to discriminate if a child has a learning disability or an emotional disturbance. As in previous research, the LD and ED students had similar Verbal, Performance and Full Scale IQ profiles. The mean scale scores for the LD and ED students were comparable to previous research cited by Kamphaus (1993).

Likewise, there seem to be no evidence in this or previous research (Watkins & Kush, 1993) that would justify using a WISC-III subtest analysis to discriminate between LD and ED children. All subtest variables that were identified as discriminators had mean score differences less than one standard deviation. What the WISC-III and other intelligence tests appear to be lacking is an ability to measure social reasoning and intuition. Intelligence tests that can separate processing weaknesses from problem solving ability and social intelligence may be more useful for psychologists to better separate a learning disability from a serious emotional disturbance.

School systems, and psychologists in general, will continue to administer intelligence tests to children suspected to having a learning or emotional disability, although there is a lack of foundation for this practice. The primary reasons are to eliminate other special programming needs (e.g., mental retardation, gifted education), to determine whether or not there is an ability/achievement discrepancy, consumer pressure and professional identity. With the exception of the first reason, the continued use of intelligence testing as a major component for a LD or ED evaluation does not seem

warranted. Fortunately, the trend for LD testing (Merrell & Shinn, 1990) is towards less emphasis on intelligence testing and more emphasis on educational testing.

Educational Testing

In order for a student to qualify for special education services, his assessed disability must be adversely impacting his educational performance. Educational performance is almost always synonymous with academic achievement as measured on an individually administered achievement test. The practice of administering achievement tests, especially in reading, appears to be an effective tool in discriminating between LD and ED children. This research, like others, revealed that LD children as a group have significantly lower reading skills than ED children. The LD children scored in the below average classification (86.3) and the ED children scored in the lower limits of the average range (93.0). One would expect the LD students to score lower considering a significant discrepancy must exist between intelligence and achievement for a learning disability diagnosis. The ED eligibility definition does not mention a discrepancy criteria or define what constitutes "adversely affecting educational performance". This has been argued as one of the major reasons the ED classification is difficult to operationalize across various educational settings.

This research raises an important issue. If ED children are performing within the average range on achievement and intelligence tests, then what is contributing to their academic weaknesses? School psychologists and others involved in the special education

assessment may need to rely less on standardized instruments and more on alternative assessment procedures to help answer this question. Specifically, evaluating the curriculum, instructional materials, student's school work and the student - teacher interaction will help to better understand the student's academic weaknesses and needs.

The dissatisfaction addressed in prior research (Aaron, 1991; Siegel, 1989) about using an IQ-achievement discrepancy to determine a reading disability is an important issue. The reasons why children have difficulty reading cannot be answered by the results of an intelligence test. As this research indicated, the LD children scored significantly lower than the ED children on a reading instrument, but their IQ profiles were similar. In addition, a WISC-III subtest profile was not identified that could realistically separate LD and ED students. In addition, IQ testing does not identify procedures for remedial instruction. As stated by others (Aaron, 1995), school psychologists will need to depend on alternative assessment procedures to help teachers understand the causes of the reading problem and techniques to remediate the problem. Informal assessments that measure decoding skills, reading speed, oral reading, spelling, errors of syntax, context dependency and orthographic processing can support findings from formalized assessment instruments (Aaron, 1995). More importantly this diagnostic information can provide relevant information to a teacher for remediation purposes.

Family Characteristics

To help understand the differences between LD and ED children, the family

composition and parent's educational level (father's education in a two parent home) were analyzed. The results indicated that the composition of the family (intact or not intact) was a significant discriminator between the disability groups. LD children resided with both biological parents (58% to 19%) much more often than ED children. Furthermore, ED children lived in either foster placements or with other relatives 21% of the time, compared to 3% for LD students. These findings were consistent with the research of Zinn & Shoenborn (1990) who stated that children from disruptive family structures had a greater chance of developing emotional problems that may impact school performance. In addition, the family composition was positively correlated with the level of special education services. The children who lived in intact families, especially LD students, generally required less special education services.

The relationship between the parent's educational level and other variables in the study provided some interesting trends. There was a positive relationship between IQ and achievement scores and parental educational level. Also children who received resource services had parents with a higher educational level than those in the self contained or day program.

Understanding the family characteristics of students provide some unique opportunities for school systems. This information can assist schools in identifying children who may be at-risk for school failure before they enter kindergarten. Too often a student must fail or exhibit a severe behavioral problem before he/she receives special attention. Early screening programs that concentrate on letter awareness, print concepts

and phonemic awareness can help schools develop reading enrichment programs at the lower grade levels. It would be to the student's benefit if early intervention services could be offered before school failure occurs. Understanding the child's family background seems to be one way of predicting school performance.

Demographic Variables

The overall gender characteristics of the sample were representative of previous findings that indicated male to female ratios in special education programs to be about 3:1. The gender ratio in the ED program was approximately 4:1 in favor of males. The gender ratios were the same for the LD resource and self contained service delivery models. The most restrictive environment (the day program) was over represented by males (91%). There is little evidence from previous psychological or educational research that would support the reason for such a gender imbalance in the LD and ED programs. Sex bias in referrals by teachers has been identified as a reason for the high representation of males in special education (Clarizo & Phillips, 1986). These findings may suggest that the teacher-child interaction is an important variable in determining who will be referred for special education testing. Another interesting finding from this sample is the age in which children were referred for an evaluation. The average age was approximately 8 years old for both disability groups. This information indicates that, around the second to third grade level, teachers and/or parents had significant concerns about a child's learning and/or emotional development to warrant a special education evaluation. The age a child was referred for testing was in line with previous research (Fugate et al., 1993). However, the

research has suggested that at the end of first grade a child can be identified with a reading disability (Hurford et al., 1993). An interesting trend from this sample that has not been supported in earlier research (Cone et al., 1985) is a positive correlation between age referred and reading and mathematics skills. The older a child was referred for an evaluation, the better he performed on the educational tests. This may speak favorably to the child study committee programs that provide the child with additional support or accommodations before a special education evaluation is requested.

Service Delivery Model

In recent years there has been a movement towards teaching children with disabilities in the regular education environment. Federal policies and recent court decisions have supported the concept of inclusion and mainstreaming. The impact of this movement towards merging regular and special education is not clearly understood at this time. The reasons for this sudden emphasis towards inclusion seem to be motivated by many factors including concerns with current special education outcomes, rising costs and unequal opportunities for students with disabilities.

The results from this research concluded that LD resource children were more accurately classified (96.2%) than the self-contained students (38.9%) based on the discriminant function. Furthermore, reading skills was the best discriminator between the resource and self contained students. It makes sense that a child with a severe reading disability would be placed in a more intensive program. Family characteristics and IQ

scores were significantly correlated with the level of special education services a child received. However, the results are also indicating that other factors must be influencing the placement decision besides the variables analyzed. These factors may be related towards the educational movement of teaching children with learning disabilities in the regular education or resource environment.

The results of the ED students were less clear. This may be the result of the smaller sample size and/or the general difficulty with assessment and diagnosis of the ED disability as reviewed in the research section. The ED classification predictions were high (71.8% and 95.5 %) when discriminating between the resource and self contained model. However, the discriminating variables lacked directional consistency with the overall service delivery model continuum (resource, self contained and day program). Upon comparing ED students who spend less than 50% of the day in special education (resource) with those who spend more than 50% of the day in special education (self contained and day program) some significant differences were identified. Resource students scored higher on sections of the WISC-III, and the parent's educational level were higher for the resource students. Other factors not related to formal assessment may be influencing the service delivery model decisions for an ED student. These factors may include administrative decisions, discipline records, cost and advocacy.

Implications and Recommendations for School Psychologists

This research highlighted the need of the special education and school psychology

field to examine the procedures to identify a learning disability and serious emotional disturbance. This research supported the findings of others who questioned the current practice of administering an intelligence test to discriminate a learning disability from a serious emotional disturbance. What this research did emphasize was the importance of a comprehensive reading evaluation and family assessment to better understand the unique differences between the two disability groups.

The findings also suggested that there may be more similarities than differences between LD and ED students. This observation and the research findings tend to support those who advocate a cross categorical classification procedure. The descriptive data of the sample indicated that the student's age, gender and the age in which a child was referred for an evaluation were very similar for both groups. WISC-III scale and subtest scores were overall the same and lacked specific patterns that would distinguish the two groups. Although reading scores were statistically different, the mathematics scores were the same. Factors that seem to accent differences between the two disability groups and the level of services a child received were related to family characteristics. Although this information is important to understand, it is information that can not be manipulated by the school system.

A criticism of this research may be the intentional deletion of personality and behavioral measurements. Some may believe that the significant differences between the two groups lie with this missing data. This researcher does not believe this to be the case.

Personality measurements for young children lack reliability and validity and may provide false personality profiles. In addition, we know that children with learning and emotional disabilities often have overlapped behavioral traits (Fessler et al., 1991).

These results may have limited applicability to settings outside the three participating school systems. However, the tests analyzed and the rich variety of demographic data provided was typical of assessment information collected for a special education evaluation. Readers are cautioned to appraise the limitations and sample characteristics when considering the following recommendations.

1) Based on the results of this study, it is recommended that school psychologists explore alternative methods to assess the intelligence of learning disabled and seriously emotionally disturbed students. The WISC-III, the most popular intelligence instrument, seems to lack clinical importance in understanding learning disabled and seriously emotionally disturbed students. Policy issues and simple statistical thinking may drive the continued use of this instrument and not sound clinical judgment. Therefore, an intelligence test that measures social intelligence and judgment would provide useful information to better discriminate between the two disabilities. For example, the results of the verbal comprehension subtest showed that ED students scored lower than LD children on questions that measure social intelligence and commonsense.

2) These research results emphasize the importance of school psychologists to acquire exceptional reading diagnostic skills. School psychologists must be prepared not only to diagnose the causes of the reading disability, but to work with classroom teachers

to develop appropriate remediation techniques. The reliance on an IQ/achievement discrepancy formula fails adequately to diagnose a reading disability or to provide useful remedial techniques. Children may still have a reading disability though a discrepancy does not exist. It is recommended that the school psychologist's role of primarily participating in special education eligibility decisions should shift to one of diagnostician and consultant. Furthermore, universities and school psychology training programs should reevaluate their curriculums to insure that adequate training and applied experiences are provided in reading assessment and remediation.

3) The results of this study highlighted the importance of family characteristics in understanding a learning disability or serious emotional disturbance. Therefore, it is recommended that school psychologists expand their assessment procedures to the family environment. Family patterns such as abuse, frequent moves, and child-adult relationships may provide useful clinical data to help gain an understanding of a child's learning or emotional needs. School psychologists need to understand the child in context of his environment.

4) The descriptive data from this study suggested two important considerations for school psychologists. The age in which children were referred for an initial evaluation and the gender of the children being referred for special education services should be considered as important diagnostic information. It is recommended that school psychologists be active in early intervention efforts that promote specialized services to children at a younger age who may be at-risk for school failure. Services should be

provided before a child fails. In addition, the descriptive data showed that males were heavily represented in LD and ED programs, although there is a lack of psycho-educational reasons for this trend. School psychologists working with teachers in understanding the developmental and learning characteristics of males and females may help close the gender gap.

5) Because of the recent movement to teach special education students in the regular classrooms, school psychologists need to take an active role at the IEP meetings. The results of this research suggested that reading was a significant discriminator for the LD delivery service models. Other test data were not effective discriminators between the different LD service delivery models. The results also inferred that other extraneous factors not measured during the assessment were considered by the IEP committee. It is recommended that school psychologists be a standing member of the IEP committee. School psychologists need to present their assessment findings with instructional recommendations to help the IEP committees decide.

Recommendations for Further Research

1) To expand upon the findings and to allow generalization of the results, this study should be replicated using a random sampling procedure across different geographic regions. Variations of the study could include having an additional sample of students who were evaluated, but found ineligible for special education services.

2) To conduct the same research, but to include behavioral assessment data that has similar psychometric characteristics of the intelligence and achievement tests.

3) Expand the variables to include other objective data that may help discriminate between LD and ED students. This may include attendance, retention, state wide assessment results, birth order, number of siblings, and number of times moved.

4) Conduct similar research, but substitute the WISC-III with another intelligence instrument or compare a sample of students who were administered the WISC-III, to a group who were administered a different intelligence test. Furthermore, expand the achievement data to include the subtests associated with reading and mathematics (e.g., decoding, comprehension, computation and application). Include other achievement measures such as writing.

5) To gain a better understanding of why children is placed in a specific service delivery model, school psychologists may want to survey IEP committee members on how they came to specific placement decisions. This will help school psychologists to understand if the IEP committee is considering their assessment practices and results.

6) Research that investigates the reasons why a child was referred for an ED evaluation and the factors that determined a child was ED may help develop an operationalized definition.

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APPENDIX A

DENNIS W. KELLISON
Superintendent

ELEANOR F. ROSS
Assistant Superintendent

October 23, 1995

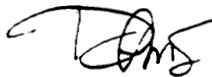
Mr. Scott Kizner, Director
Instructional and Pupil Services
Clarke Count Public Schools
309 West Main Street
Berryville, VA 22611

Dear Scott,

Permission is granted for you to conduct research in the
It is my understanding that your research involves the collection of existing data located in the
special education files. I trust that you will protect the privacy of our students and no identifiable
information will be recorded as part of your study. In light of your position as Director of
Instructional and Pupil Services, which already allows you access to the special education files,
and the nature of this research, you are exempted from obtaining parental permission.

I wish you luck with your research and I look forward to your findings. If I can be of
further assistance, please let me know.

Sincerely,



Dennis W. Kellison
Superintendent

DWK/SRK/afw

April 18, 1995

Mr. Scott R. Kizner, Director
Instructional and Pupil Services
Clarke County Public Schools
309 West Main Street
Berryville, Virginia 22611

Dear Scott:

Pursuant to our recent conversation regarding your planned dissertation and the access to special education statistical information, you are hereby granted permission to proceed with your research project, working directly with Mike Jeffries in making certain that all current legal requirements are followed so as to protect the privacy of our students and the historical data contained in confidential files. I am very interested in the results of your data being made available to Mike and other members of our staff as it may shed additional light on our capacity to predict special education requirements for our students.

If you should have difficulty, please do not hesitate to call upon Mike, Ned Browning, Assistant Superintendent, or me for assistance. Best wishes as you begin your dissertation project.

Sincerely,



Glenn R. Burdick
Superintendent

GRB/cl

cc: Mr. Mike Jeffries, Director, Student Support Services
Mr. Ned Browning, Assistant Superintendent
Mr. Dennis Kellison, Superintendent, Clarke County Public Schools

**Request to Collect Data for
Educational Studies**

Name Scott Kizner

Address 705 Seldon Drive, Winchester, VA 22601

Phone Number 662-8160

Credentials B.A., M.A., Ed.S. degrees. Working towards Ph.D. in School

Psychology. Certified as a School Psychologist and Special Education Supervisor.

Topic Being Studied The intellectual, educational, and sociological determinants of learning disabled & emotionally disturbed child

Reason for Data Collection Data collected will be utilized in research to complete dissertation requirements of doctoral program at VA Tech (supervised by doctoral commit (Note other organizations/universities with which associated)

Specific Data to be Collected Intelligence information (WISC-II), Individual educational reports, sociocultural information. All data will be generated from existing reports in the Category II files. Reports from the child's last eligibility will be investigated.

Data Will be Collected From: Records Employees
Students Parents

Description of Data Gathering Techniques Data will be collected in a location approved by Files of identified LD and ED children evaluated in grades K-8 would be reviewed.

Description of Data Use Data would be formatted for discriminant analysis and multiple regression and correlation procedures. No data that will identify the student will be collected. Data will be incorporated in my discussion and research sections of my dissertation.

Amount of Time Required to Supply Information Approximately 5-10 days

Timeframe for Collecting Data Summer of 1995

Dissemination/Publication of Data December 95 or May 96

APPENDIX B

973-268

CERTIFICATION OF EXEMPTION OF PROJECTS INVOLVING HUMAN SUBJECTS

3

Investigator(s): Scott R. Kizner Dr. Thomas Hohenshil, Faculty Advisor
 Department(s): Student Personnel and Counseling Services, Dept. of Educational and Admin. Services
 Project Title: A Comparative Study of Students with Learning Disabilities and Serious Emotional Disturbances
 Source of Support: Departmental Research Sponsored Research Proposal No. _____

1. The criteria for "exemption" from review by the IRB for a project involving the use of human subjects and with no risk to the subject is listed below. Please initial all applicable conditions and provide the substantiating statement of protocol.

- a. The research will be conducted in established or commonly established educational settings, involving normal education practices. For example:
 - 1) Research on regular and special education instructional strategies;
 - 2) Research on effectiveness of instructional techniques, curricula or classroom management techniques.
- b. The research involves use of education tests (cognitive, diagnostic, aptitude, achievement), and the subject cannot be identified directly or through identifiers with the information.
- c. The research involves survey or interview procedures, in which:
 - 1) Subjects cannot be identified directly or through identifiers with the information;
 - 2) Subject's responses, if known, will not place the subject at risk of criminal or civil liability or be damaging to the subject's financial standing or employability;
 - 3) The research does not deal with sensitive aspects of subject's own behavior (illegal conduct, drug use, sexual behavior or alcohol use);
 - 4) The research involves survey or interview procedures with elected or appointed public officials, or candidates for public office.
- d. The research involves the observation of public behavior, in which:
 - 1) The subjects cannot be identified directly or through identifiers;
 - 2) The observations recorded about an individual could not put the subject at risk of criminal or civil liability or be damaging to the subject's financial standing or employability;
 - 3) The research does not deal with sensitive aspects of the subject's behavior (illegal conduct, drug use, sexual behavior or use of alcohol).
- e. The research involves collection or study of existing data, documents, recording pathological specimens or diagnostic specimens, of which:
 - 1) The sources are publicly available; or
 - 2) The information is recorded such that the subject cannot be identified directly or indirectly through identifiers.

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2. I further certify that the project will not be changed to increase the risk or exceed exempt condition(s) without filing an additional certification or application for use by the Human Subjects Review Board.

Note: If children are in any way at risk while this project is underway, the chairman of IRB should be notified immediately in order to take corrective action.

Scott R. Kizner
 Investigator's/Date

[Signature] 11/13/95
 Chair, Institutional Review Board/Date

Departmental Reviewer/Date

APPENDIX C

Table C 1**Description of Variables**

Variables Studied In Research	
Var 1	disability 1=ld 2=ed
Var 2	1=resource,2=self cont,
Var 3	age
Var 4	age referred
Var 5	age tested
Var 6	gender 1=m, 2=f
Var 7	family comp 1=other, 2= intact
Var 8	parent educational level
Var 9	grade
Var 10	verbal IQ
Var 11	performance IQ
Var 12	full scale IQ
Var 13	information
Var 14	similarities
Var 15	arithmetic
Var 16	vocabulary
Var 17	comprehension
Var 18	digit span
Var 19	picture completion
Var 20	coding
Var 21	picture arrangement
Var 22	block design
Var 23	object assembly
Var 24	reading
Var 25	math
Var 26	v>p
Var 27	p>v

Table C 2

Correlations of WISC-III, Educational and Demographic Data for Entire Sample

STAT.		Correlations (srk.sta)									
BASIC		Marked correlations are significant at p < .05000									
STATS											
Variable	VAR1	VAR2	VAR3	VAR4	VAR5	VAR6	VAR7	VAR8	VAR9	VAR10	NEWVAR 11
VAR1	1.00	.45*	.15*	.06	.12*	-.04	-.34*	-.10*	.18*	-.07	.00
VAR2	.45*	1.00	.04	-.03	.06	-.02	-.27*	-.28*	.05	-.35*	-.24*
VAR3	.15*	.04	1.00	.30*	.91*	-.00	-.15*	.10*	.96*	-.09	-.03
VAR4	.06	-.03	.30*	1.00	.29*	.04	-.07	.21*	.32*	.13*	.12*
VAR5	.12*	.06	.91*	.29*	1.00	-.04	-.16*	.12*	.92*	-.10	-.05
VAR6	-.04	-.02	-.00	.04	-.04	1.00	.03	-.11*	.02	-.15*	-.10
VAR7	-.34*	-.27*	-.15*	-.07	-.16*	.03	1.00	.13*	-.15*	.13*	.09
VAR8	-.10*	-.28*	.10*	.21*	.12*	-.11*	.13*	1.00	.14*	.41*	.22*
VAR9	.18*	.05	.96*	.32*	.92*	.02	-.15*	.14*	1.00	-.02	-.01
VAR10	-.07	-.35*	-.09	.13*	-.10	-.15*	.13*	.41*	-.02	1.00	.53*
NEWVAR11	.00	-.24*	-.03	.12*	-.05	-.10	.09	.22*	-.01	.53*	1.00
NEWVAR12	-.04	-.34*	-.07	.15*	-.09	-.14*	.12*	.37*	-.01	.89*	.86*
NEWVAR13	-.00	-.30*	-.03	.08	-.05	-.12*	.09	.36*	.03	.80*	.42*
NEWVAR14	-.06	-.33*	-.01	.09	-.02	-.12*	.12*	.36*	.04	.85*	.46*
NEWVAR15	-.03	-.23*	-.10*	.18*	-.09	-.19*	.03	.30*	-.06	.71*	.45*
NEWVAR16	-.09	-.32*	-.15*	.06	-.17*	-.11*	.11*	.38*	-.08	.85*	.42*
NEWVAR17	-.12*	-.24*	-.07	.12*	-.08	-.08	.16*	.27*	-.02	.82*	.43*
NEWVAR18	.09	-.09	.00	.10	-.01	-.10	-.02	.17*	.07	.44*	.25*
NEWVAR19	.09	-.07	.12*	.05	.13*	-.08	.04	.12*	.17*	.40*	.70*
NEWVAR20	.04	-.09	-.14*	.10*	-.18*	.14*	.00	.05	-.12*	.14*	.48*
NEWVAR21	-.02	-.20*	-.01	.09	-.02	-.06	.12*	.18*	.00	.40*	.70*
NEWVAR22	-.00	-.23*	-.09	.14*	-.08	-.22*	.02	.21*	-.08	.51*	.76*
NEWVAR23	-.03	-.17*	-.02	.05	-.03	-.15*	.06	.15*	-.01	.32*	.73*
NEWVAR24	.19*	-.20*	.23*	.28*	.19*	-.02	-.03	.38*	.29*	.59*	.31*
NEWVAR25	.03	-.23*	-.06	.19*	-.07	-.09	.06	.27*	-.01	.65*	.46*
NEWVAR26	.08	.03	.12*	.04	.11*	.02	-.07	-.18*	.09	-.27*	.28*
NEWVAR27	.05	-.04	.09	.06	.07	-.05	-.01	.10*	.11*	.28*	-.27*

STAT.		Correlations (srk.sta)									
BASIC		Marked correlations are significant at p < .05000									
STATS											
Variable	NEWVAR 12	NEWVAR 13	NEWVAR 14	NEWVAR 15	NEWVAR 16	NEWVAR 17	NEWVAR 18	NEWVAR 19	NEWVAR 20	NEWVAR 21	NEWVAR 22
VAR1	-.04	-.00	-.06	-.03	-.09	-.12*	.09	.09	.04	-.02	-.00
VAR2	-.34*	-.30*	-.33*	-.23*	-.32*	-.24*	-.09	-.07	-.09	-.20*	-.23*
VAR3	-.07	-.03	-.01	-.10*	-.15*	-.07	.00	.12*	-.14*	-.01	-.09
VAR4	.15*	.08	.09	.18*	.06	.12*	.10	.05	.10*	.09	.14*
VAR5	-.09	-.05	-.02	-.09	-.17*	-.08	-.01	.13*	-.18*	-.02	-.08
VAR6	-.14*	-.12*	-.12*	-.19*	-.11*	-.08	-.10	-.08	.14*	-.06	-.22*
VAR7	.12*	.09	.12*	.03	.11*	.16*	-.02	.04	.00	.12*	.02
VAR8	.37*	.36*	.36*	.30*	.38*	.27*	.17*	.12*	.05	.18*	.21*
VAR9	-.01	.03	.04	-.06	-.08	-.02	.07	.17*	-.12*	.00	-.08
VAR10	.89*	.80*	.85*	.71*	.85*	.82*	.44*	.40*	.14*	.40*	.51*
NEWVAR11	.86*	.42*	.46*	.45*	.42*	.43*	.25*	.70*	.48*	.70*	.76*
NEWVAR12	1.00	.71*	.76*	.67*	.74*	.72*	.40*	.62*	.34*	.62*	.72*
NEWVAR13	.71*	1.00	.60*	.49*	.64*	.54*	.37*	.35*	.08	.31*	.42*
NEWVAR14	.76*	.60*	1.00	.48*	.70*	.65*	.32*	.41*	.08	.32*	.43*
NEWVAR15	.67*	.49*	.48*	1.00	.49*	.48*	.42*	.27*	.20*	.32*	.44*
NEWVAR16	.74*	.64*	.70*	.49*	1.00	.65*	.31*	.30*	.15*	.29*	.41*
NEWVAR17	.72*	.54*	.65*	.48*	.65*	1.00	.36*	.30*	.12*	.37*	.37*
NEWVAR18	.40*	.37*	.32*	.42*	.31*	.36*	1.00	.16*	.13*	.21*	.22*
NEWVAR19	.62*	.35*	.41*	.27*	.30*	.30*	.16*	1.00	.12*	.41*	.42*
NEWVAR20	.34*	.08	.08	.20*	.15*	.12*	.13*	.12*	1.00	.20*	.18*
NEWVAR21	.62*	.31*	.32*	.32*	.29*	.37*	.21*	.41*	.20*	1.00	.44*
NEWVAR22	.72*	.42*	.43*	.44*	.41*	.37*	.22*	.42*	.18*	.44*	1.00
NEWVAR23	.58*	.21*	.29*	.27*	.24*	.26*	.08	.44*	.17*	.33*	.55*

Note: See Table C 1 on Page 145 for Description of Variables.

Table C 2 (continued)

Correlation of WISC-III, Educational and Demographic Data for Entire Sample

STAT. Correlations (srk.sta)											
BASIC Marked correlations are significant at p < .05000											
STATS											
Variable	NEWVAR 12	NEWVAR 13	NEWVAR 14	NEWVAR 15	NEWVAR 16	NEWVAR 17	NEWVAR 18	NEWVAR 19	NEWVAR 20	NEWVAR 21	NEWVAR 22
NEWVAR24	.52*	.54*	.46*	.46*	.50*	.43*	.36*	.22*	.18*	.19*	.23*
NEWVAR25	.64*	.57*	.49*	.67*	.45*	.50*	.39*	.24*	.19*	.36*	.44*
NEWVAR26	-.01	-.23*	-.21*	-.14*	-.28*	-.23*	-.20*	.22*	.12*	.21*	.15*
NEWVAR27	.03	.24*	.28*	.08	.30*	.26*	.07	-.14*	-.30*	-.17*	-.11*

STAT. Correlations (srk.sta)
 BASIC Marked correlations are significant at p < .05000
 STATS

Variable	NEWVAR 23	NEWVAR 24	NEWVAR 25	NEWVAR 26	NEWVAR 27
VAR1	-.03	.19*	.03	.08	.05
VAR2	-.17*	-.20*	-.23*	.03	-.04
VAR3	-.02	.23*	-.06	.12*	.09
VAR4	.05	.28*	.19*	.04	.06
VAR5	-.03	.19*	-.07	.11*	.07
VAR6	-.15*	-.02	-.09	.02	-.05
VAR7	.06	-.03	.06	-.07	-.01
VAR8	.15*	.38*	.27*	-.18*	.10*
VAR9	-.01	.29*	-.01	.09	.11*
VAR10	.32*	.59*	.65*	-.27*	.28*
NEWVAR11	.73*	.31*	.46*	.28*	-.27*
NEWVAR12	.58*	.52*	.64*	-.01	.03
NEWVAR13	.21*	.54*	.57*	-.23*	.24*
NEWVAR14	.29*	.46*	.49*	-.21*	.28*
NEWVAR15	.27*	.46*	.67*	-.14*	.08
NEWVAR16	.24*	.50*	.45*	-.28*	.30*
NEWVAR17	.26*	.43*	.50*	-.23*	.26*
NEWVAR18	.08	.36*	.39*	-.20*	.07
NEWVAR19	.44*	.22*	.24*	.22*	-.14*
NEWVAR20	.17*	.18*	.19*	.12*	-.30*
NEWVAR21	.33*	.19*	.36*	.21*	-.17*
NEWVAR22	.55*	.23*	.44*	.15*	-.11*
NEWVAR23	1.00	.18*	.29*	.24*	-.20*
NEWVAR24	.18*	1.00	.61*	-.18*	.13*
NEWVAR25	.29*	.61*	1.00	-.13*	.07
NEWVAR26	.24*	-.18*	-.13*	1.00	-.16*
NEWVAR27	-.20*	.13*	.07	-.16*	1.00

Note: See Table C 1 on Page 145 for Description of Variables.

Table C 3

Correlations of WISC-III, Educational and Demographic Data for LD Sample.

STAT.		Correlations (srk.sta)									
BASIC		Marked correlations are significant at p < .05000									
STATS											
Variable	VAR1	VAR2	VAR3	VAR4	VAR5	VAR6	VAR7	VAR8	VAR9	VAR10	NEWVAR 11
VAR1	1.00	--	--	--	--	--	--	--	--	--	--
VAR2	--	1.00	.06	-.07	.06	.01	-.14*	-.25*	.06	-.35*	-.27*
VAR3	--	.06	1.00	.29*	.94*	.01	-.14*	.13*	.97*	-.09	-.07
VAR4	--	-.07	.29*	1.00	.31*	.02	-.07	.26*	.32*	.14*	.13*
VAR5	--	.06	.94*	.31*	1.00	-.01	-.14*	.16*	.93*	-.07	-.06
VAR6	--	.01	.01	.02	-.01	1.00	.01	-.10	.04	-.12*	-.05
VAR7	--	-.14*	-.14*	-.07	-.14*	.01	1.00	.09	-.12*	.12*	.09
VAR8	--	-.25*	.13*	.26*	.16*	-.10	.09	1.00	.18*	.44*	.21*
VAR9	--	.06	.97*	.32*	.93*	.04	-.12*	.18*	1.00	-.01	-.04
VAR10	--	-.35*	-.09	.14*	-.07	-.12*	.12*	.44*	-.01	1.00	.49*
NEWVAR11	--	-.27*	-.07	.13*	-.06	-.05	.09	.21*	-.04	.49*	1.00
NEWVAR12	--	-.36*	-.09	.16*	-.08	-.10	.12*	.38*	-.03	.88*	.84*
NEWVAR13	--	-.31*	-.02	.14*	-.02	-.10	.08	.38*	.04	.80*	.38*
NEWVAR14	--	-.35*	-.02	.10	-.02	-.08	.11	.37*	.03	.86*	.43*
NEWVAR15	--	-.24*	-.11	.17*	-.08	-.18*	.05	.31*	-.06	.71*	.40*
NEWVAR16	--	-.33*	-.18*	.03	-.17*	-.07	.09	.40*	-.11	.84*	.36*
NEWVAR17	--	-.20*	-.04	.11	-.03	-.06	.16*	.29*	.03	.81*	.38*
NEWVAR18	--	-.10	-.02	.07	-.03	-.09	.03	.18*	.04	.41*	.19*
NEWVAR19	--	-.11*	.09	.10	.11	.01	.07	.14*	.13*	.34*	.67*
NEWVAR20	--	-.16*	-.15*	.03	-.18*	.17*	.04	.04	-.13*	.11	.48*
NEWVAR21	--	-.23*	-.04	.11	-.05	-.01	.12*	.16*	-.01	.42*	.72*
NEWVAR22	--	-.22*	-.10	.14*	-.08	-.20*	.04	.21*	-.10	.45*	.76*
NEWVAR23	--	-.18*	-.03	.08	-.02	-.12*	.01	.15*	-.01	.29*	.74*
NEWVAR24	--	-.33*	.21*	.23*	.23*	.03	.01	.43*	.28*	.61*	.27*
NEWVAR25	--	-.28*	-.08	.18*	-.04	-.08	.05	.28*	-.02	.66*	.42*
NEWVAR26	--	.00	.09	.05	.08	.05	-.06	-.19*	.05	-.28*	.29*
NEWVAR27	--	-.05	.11	.08	.10	-.06	.05	.13*	.12*	.27*	-.32*

STAT.		Correlations (srk.sta)									
BASIC		Marked correlations are significant at p < .05000									
STATS											
Variable	NEWVAR 12	NEWVAR 13	NEWVAR 14	NEWVAR 15	NEWVAR 16	NEWVAR 17	NEWVAR 18	NEWVAR 19	NEWVAR 20	NEWVAR 21	NEWVAR 22
VAR1	--	--	--	--	--	--	--	--	--	--	--
VAR2	-.36*	-.31*	-.35*	-.24*	-.33*	-.20*	-.10	-.11*	-.16*	-.23*	-.22*
VAR3	-.09	-.02	-.02	-.11	-.18*	-.04	-.02	.09	-.15*	-.04	-.10
VAR4	.16*	.14*	.10	.17*	.03	.11	.07	.10	.03	.11	.14*
VAR5	-.08	-.02	-.02	-.08	-.17*	-.03	-.03	.11	-.18*	-.05	-.08
VAR6	-.10	-.10	-.08	-.18*	-.07	-.06	-.09	.01	.17*	-.01	-.20*
VAR7	.12*	.08	.11	.05	.09	.16*	.03	.07	.04	.12*	.04
VAR8	.38*	.38*	.37*	.31*	.40*	.29*	.18*	.14*	.04	.16*	.21*
VAR9	-.03	.04	.03	-.06	-.11	.03	.04	.13*	-.13*	-.01	-.10
VAR10	.88*	.80*	.86*	.71*	.84*	.81*	.41*	.34*	.11	.42*	.45*
NEWVAR11	.84*	.38*	.43*	.40*	.36*	.38*	.19*	.67*	.48*	.72*	.76*
NEWVAR12	1.00	.70*	.76*	.66*	.71*	.70*	.36*	.58*	.33*	.65*	.70*
NEWVAR13	.70*	1.00	.61*	.49*	.65*	.53*	.34*	.30*	.06	.34*	.37*
NEWVAR14	.76*	.61*	1.00	.50*	.68*	.64*	.32*	.38*	.04	.34*	.39*
NEWVAR15	.66*	.49*	.50*	1.00	.47*	.46*	.40*	.23*	.15*	.33*	.40*
NEWVAR16	.71*	.65*	.68*	.47*	1.00	.61*	.28*	.21*	.12*	.31*	.35*
NEWVAR17	.70*	.53*	.64*	.46*	.61*	1.00	.34*	.26*	.08	.38*	.32*
NEWVAR18	.36*	.34*	.32*	.40*	.28*	.34*	1.00	.11	.09	.20*	.15*
NEWVAR19	.58*	.30*	.38*	.23*	.21*	.26*	.11	1.00	.09	.42*	.40*
NEWVAR20	.33*	.06	.04	.15*	.12*	.08	.09	.09	1.00	.21*	.14*
NEWVAR21	.65*	.34*	.34*	.33*	.31*	.38*	.20*	.42*	.21*	1.00	.47*
NEWVAR22	.70*	.37*	.39*	.40*	.35*	.32*	.15*	.40*	.14*	.47*	1.00
NEWVAR23	.58*	.19*	.29*	.24*	.20*	.24*	.08	.43*	.19*	.32*	.57*

Note: See Table C 1 on Page 145 for Description of Variables.

Table C 3 (continued)

Correlations of WISC-III, Educational and Demographic Data for LD Sample.

STAT.		Correlations (srk.sta)									
BASIC		Marked correlations are significant at p < .05000									
STATS											
Variable	NEWVAR	NEWVAR	NEWVAR	NEWVAR	NEWVAR	NEWVAR	NEWVAR	NEWVAR	NEWVAR	NEWVAR	NEWVAR
	12	13	14	15	16	17	18	19	20	21	22
NEWVAR24	.52*	.59*	.47*	.46*	.50*	.43*	.29*	.19*	.14*	.20*	.17*
NEWVAR25	.63*	.59*	.51*	.67*	.45*	.46*	.36*	.21*	.14*	.38*	.40*
NEWVAR26	-.00	-.24*	-.20*	-.18*	-.30*	-.21*	-.25*	.24*	.12*	.20*	.20*
NEWVAR27	-.00	.22*	.27*	.06	.28*	.26*	.07	-.18*	-.36*	-.16*	-.15*

STAT.		Correlations (srk.sta)				
BASIC		Marked correlations are significant at p < .05000				
STATS						
Variable	NEWVAR	NEWVAR	NEWVAR	NEWVAR	NEWVAR	NEWVAR
	23	24	25	26	27	
VAR1	--	--	--	--	--	
VAR2	-.18*	-.33*	-.28*	.00	-.05	
VAR3	-.03	.21*	-.08	.09	.11	
VAR4	.08	.23*	.18*	.05	.08	
VAR5	-.02	.23*	-.04	.08	.10	
VAR6	-.12*	.03	-.08	.05	-.06	
VAR7	.01	.01	.05	-.06	.05	
VAR8	.15*	.43*	.28*	-.19*	.13*	
VAR9	-.01	.28*	-.02	.05	.12*	
VAR10	.29*	.61*	.66*	-.28*	.27*	
NEWVAR11	.74*	.27*	.42*	.29*	-.32*	
NEWVAR12	.58*	.52*	.63*	-.00	-.00	
NEWVAR13	.19*	.59*	.59*	-.24*	.22*	
NEWVAR14	.29*	.47*	.51*	-.20*	.27*	
NEWVAR15	.24*	.46*	.67*	-.18*	.06	
NEWVAR16	.20*	.50*	.45*	-.30*	.28*	
NEWVAR17	.24*	.43*	.46*	-.21*	.26*	
NEWVAR18	.08	.29*	.36*	-.25*	.07	
NEWVAR19	.43*	.19*	.21*	.24*	-.18*	
NEWVAR20	.19*	.14*	.14*	.12*	-.36*	
NEWVAR21	.32*	.20*	.39*	.20*	-.16*	
NEWVAR22	.57*	.17*	.40*	.20*	-.15*	
NEWVAR23	1.00	.18*	.27*	.27*	-.20*	
NEWVAR24	.18*	1.00	.61*	-.24*	.11*	
NEWVAR25	.27*	.61*	1.00	-.16*	.08	
NEWVAR26	.27*	-.24*	-.16*	1.00	-.18*	
NEWVAR27	-.20*	.11*	.08	-.18*	1.00	

Note: See Table C 1 on Page 145 for Description of Variables.

Table C 4

Correlations of WISC-III, Educational and Demographic Data for ED Sample

STAT.		Correlations (srk.sta)									
BASIC		Marked correlations are significant at p < .05000									
STATS											
Variable	VAR1	VAR2	VAR3	VAR4	VAR5	VAR6	VAR7	VAR8	VAR9	VAR10	NEWVAR11
VAR1	1.00	--	--	--	--	--	--	--	--	--	--
VAR2	--	1.00	-.29*	-.06	-.12	-.03	-.16	-.30*	-.32*	-.37*	-.28*
VAR3	--	-.29*	1.00	.29*	.84*	-.02	.02	.09	.93*	-.03	.07
VAR4	--	-.06	.29*	1.00	.21*	.11	.02	.09	.30*	.14	.11
VAR5	--	-.12	.84*	.21*	1.00	-.10	-.09	.08	.90*	-.13	-.02
VAR6	--	-.03	-.02	.11	-.10	1.00	.01	-.17	-.02	-.26*	-.27*
VAR7	--	-.16	.02	.02	-.09	.01	1.00	.19	.02	.06	.11
VAR8	--	-.30*	.09	.09	.08	-.17	.19	1.00	.08	.27*	.29*
VAR9	--	-.32*	.93*	.30*	.90*	-.02	.02	.08	1.00	.03	.09
VAR10	--	-.37*	-.03	.14	-.13	-.26*	.06	.27*	.03	1.00	.67*
NEWVAR11	--	-.28*	.07	.11	-.02	-.27*	.11	.29*	.09	.67*	1.00
NEWVAR12	--	-.36*	.02	.14	-.08	-.29*	.09	.30*	.07	.92*	.90*
NEWVAR13	--	-.39*	-.09	-.07	-.16	-.18	.16	.26*	.01	.79*	.53*
NEWVAR14	--	-.32*	.11	.09	.03	-.27*	.11	.27*	.18	.85*	.58*
NEWVAR15	--	-.24*	-.05	.21*	-.13	-.22*	-.06	.24*	-.03	.71*	.62*
NEWVAR16	--	-.28*	.01	.16	-.10	-.25*	.07	.32*	.11	.89*	.61*
NEWVAR17	--	-.26*	-.06	.18	-.15	-.17	-.00	.17	-.05	.86*	.59*
NEWVAR18	--	-.25*	.02	.15	-.03	-.12	-.06	.19	.10	.60*	.44*
NEWVAR19	--	-.14	.17	-.10	.13	-.33*	.07	.08	.22*	.59*	.78*
NEWVAR20	--	.00	-.11	.33*	-.23*	.05	-.06	.14	-.15	.29*	.48*
NEWVAR21	--	-.16	.13	.07	.10	-.24*	.12	.29*	.08	.31*	.65*
NEWVAR22	--	-.36*	-.06	.14	-.08	-.28*	-.06	.20	.02	.69*	.76*
NEWVAR23	--	-.19	.03	-.01	-.04	-.24*	.24*	.14	-.00	.39*	.72*
NEWVAR24	--	-.30*	.21*	.37*	.03	-.14	.14	.32*	.24*	.62*	.44*
NEWVAR25	--	-.27*	-.02	.21*	-.15	-.11	.16	.24*	.00	.64*	.58*
NEWVAR26	--	-.03	.15	-.02	.15	-.07	.02	-.10	.17	-.26*	.23*
NEWVAR27	--	-.12	-.01	.01	-.05	.01	-.19	.01	.03	.36*	-.11

STAT.		Correlations (srk.sta)									
BASIC		Marked correlations are significant at p < .05000									
STATS											
Variable	NEWVAR12	NEWVAR13	NEWVAR14	NEWVAR15	NEWVAR16	NEWVAR17	NEWVAR18	NEWVAR19	NEWVAR20	NEWVAR21	NEWVAR22
VAR1	--	--	--	--	--	--	--	--	--	--	--
VAR2	-.36*	-.39*	-.32*	-.24*	-.28*	-.26*	-.25*	-.14	.00	-.16	-.36*
VAR3	.02	-.09	.11	-.05	.01	-.06	.02	.17	-.11	.13	-.06
VAR4	.14	-.07	.09	.21*	.16	.18	.15	-.10	.33*	.07	.14
VAR5	-.08	-.16	.03	-.13	-.10	-.15	-.03	.13	-.23*	.10	-.08
VAR6	-.29*	-.18	-.27*	-.22*	-.25*	-.17	-.12	-.33*	.05	-.24*	-.28*
VAR7	.09	.16	.11	-.06	.07	-.00	-.06	.07	-.06	.12	-.06
VAR8	.30*	.26*	.27*	.24*	.32*	.17	.19	.08	.14	.29*	.20
VAR9	.07	.01	.18	-.03	.11	-.05	.10	.22*	-.15	.08	.02
VAR10	.92*	.79*	.85*	.71*	.89*	.86*	.60*	.59*	.29*	.31*	.69*
NEWVAR11	.90*	.53*	.58*	.62*	.61*	.59*	.44*	.78*	.48*	.65*	.76*
NEWVAR12	1.00	.72*	.78*	.72*	.82*	.79*	.57*	.74*	.41*	.51*	.78*
NEWVAR13	.72*	1.00	.60*	.49*	.64*	.58*	.50*	.50*	.13	.19	.56*
NEWVAR14	.78*	.60*	1.00	.41*	.80*	.68*	.38*	.55*	.21*	.25*	.55*
NEWVAR15	.72*	.49*	.41*	1.00	.52*	.55*	.53*	.40*	.38*	.31*	.59*
NEWVAR16	.82*	.64*	.80*	.52*	1.00	.73*	.46*	.56*	.26*	.24*	.60*
NEWVAR17	.79*	.58*	.68*	.55*	.73*	1.00	.56*	.47*	.27*	.33*	.53*
NEWVAR18	.57*	.50*	.38*	.53*	.46*	.56*	1.00	.28*	.28*	.29*	.47*
NEWVAR19	.74*	.50*	.55*	.40*	.56*	.47*	.28*	1.00	.20	.40*	.49*
NEWVAR20	.41*	.13	.21*	.38*	.26*	.27*	.28*	.20	1.00	.17	.33*
NEWVAR21	.51*	.19	.25*	.31*	.24*	.33*	.29*	.40*	.17	1.00	.30*
NEWVAR22	.78*	.56*	.55*	.59*	.60*	.53*	.47*	.49*	.33*	.30*	1.00
NEWVAR23	.59*	.28*	.31*	.36*	.35*	.33*	.10	.53*	.10	.38*	.48*

Note: See Table C 1 on Page 145 for Description of Variables.

Table C 4 (continued)

Correlations of WISC-III, Educational and Demographic Data for ED Sample

STAT.		Correlations (srk.sta)									
BASIC		Marked correlations are significant at p < .05000									
STATS											
Variable	NEWVAR 12	NEWVAR 13	NEWVAR 14	NEWVAR 15	NEWVAR 16	NEWVAR 17	NEWVAR 18	NEWVAR 19	NEWVAR 20	NEWVAR 21	NEWVAR 22
NEWVAR24	.58*	.44*	.53*	.49*	.60*	.54*	.50*	.26*	.27*	.21	.42*
NEWVAR25	.67*	.50*	.44*	.69*	.46*	.63*	.48*	.34*	.36*	.31*	.56*
NEWVAR26	-.03	-.22*	-.24*	.00	-.20	-.24*	-.06	.17	.11	.27*	-.07
NEWVAR27	.15	.31*	.35*	.16	.39*	.31*	.03	-.06	-.07	-.20	.05

STAT.		Correlations (srk.sta)				
BASIC		Marked correlations are significant at p < .05000				
STATS						
Variable	NEWVAR 23	NEWVAR 24	NEWVAR 25	NEWVAR 26	NEWVAR 27	
VAR1	--	--	--	--	--	
VAR2	-.19	-.30*	-.27*	-.03	-.12	
VAR3	.03	.21*	-.02	.15	-.01	
VAR4	-.01	.37*	.21*	-.02	.01	
VAR5	-.04	.03	-.15	.15	-.05	
VAR6	-.24*	-.14	-.11	-.07	.01	
VAR7	.24*	.14	.16	.02	-.19	
VAR8	.14	.32*	.24*	-.10	.01	
VAR9	-.00	.24*	.00	.17	.03	
VAR10	.39*	.62*	.64*	-.26*	.36*	
NEWVAR11	.72*	.44*	.58*	.23*	-.11	
NEWVAR12	.59*	.58*	.67*	-.03	.15	
NEWVAR13	.28*	.44*	.50*	-.22*	.31*	
NEWVAR14	.31*	.53*	.44*	-.24*	.35*	
NEWVAR15	.36*	.49*	.69*	.00	.16	
NEWVAR16	.35*	.60*	.46*	-.20	.39*	
NEWVAR17	.33*	.54*	.63*	-.24*	.31*	
NEWVAR18	.10	.50*	.48*	-.06	.03	
NEWVAR19	.53*	.26*	.34*	.17	-.06	
NEWVAR20	.10	.27*	.36*	.11	-.07	
NEWVAR21	.38*	.21	.31*	.27*	-.20	
NEWVAR22	.48*	.42*	.56*	-.07	.05	
NEWVAR23	1.00	.22*	.34*	.13	-.19	
NEWVAR24	.22*	1.00	.63*	-.06	.17	
NEWVAR25	.34*	.63*	1.00	-.01	.04	
NEWVAR26	.13	-.06	-.01	1.00	-.10	
NEWVAR27	-.19	.17	.04	-.10	1.00	

Note: See Table C 1 on Page 145 for Description of Variables.

Table C 5

Discriminant Analysis Between LD and ED Students

STAT. Discriminant Function Analysis Summary (srk.sta)						
DISCRIM. No. of vars in model: 25; Grouping: VAR1 (2 grps)						
ANALYSIS Wilks' Lambda: .74181 approx. F (25,374)=5.2070 p< .0000						
N=400	Wilks' Lambda	Partial Lambda	F-remove (1,374)	p-level	Toler.	1-Toler. (R-Sqr.)
VAR3	.747163	.992832	2.70020	.101176	.063460	.936540
VAR4	.741952	.999805	.07303	.787126	.788379	.211621
VAR5	.748869	.990570	3.56050	.059944	.149189	.950811
VAR6	.747149	.992850	2.69320	.101618	.858244	.141756
VAR7	.804902	.921612	31.81066	.000000	.930171	.069829
VAR8	.748531	.991018	3.38988	.066390	.727599	.272401
VAR9	.756994	.979938	7.65672	.005937	.062194	.937806
VAR10	.743945	.997126	1.07791	.299835	.003597	.996403
NEWVAR11	.741915	.999855	.05435	.815790	.006669	.993331
NEWVAR12	.745138	.995529	1.67949	.195791	.002111	.997889
NEWVAR13	.741999	.999742	.09657	.756159	.126827	.873173
NEWVAR14	.741961	.999793	.07740	.781008	.099760	.900240
NEWVAR15	.742546	.999005	.37232	.542111	.135617	.864383
NEWVAR16	.745699	.994781	1.96224	.162103	.117341	.882659
NEWVAR17	.744977	.995744	1.59839	.206919	.110730	.889270
NEWVAR18	.744027	.997016	1.11933	.290745	.741036	.258964
NEWVAR19	.760473	.975455	9.41067	.002314	.202803	.797197
NEWVAR20	.752832	.985356	5.55837	.018907	.230189	.769811
NEWVAR21	.750923	.987861	4.59584	.032694	.205678	.794322
NEWVAR22	.751278	.987393	4.77520	.029492	.176644	.823356
NEWVAR23	.744918	.995823	1.56861	.211192	.203393	.796607
NEWVAR24	.785395	.944502	21.97586	.000004	.398077	.601923
NEWVAR25	.742000	.999740	.09724	.755343	.373748	.626252
NEWVAR26	.741829	.999970	.01106	.916312	.602189	.397811
NEWVAR27	.757995	.978644	8.16155	.004518	.558444	.441556

Note: See Table C 1 on Page 145 for Definition of Variables.
p-level < .05 are significant

Table C 6**LD and ED Discriminant Analysis**

Factor Structure Matrix Correlations Variables - Canonical Roots (Pooled-within-groups correlations)	
List Variable	Function 1
age	-.263125
age referred	-.109565
age tested	-.208819
gender 1=m, 2=f	.075687
family comp 1= other, 2= intact	.611057
parent educational level	.170996
grade	-.315926
verbal IQ	.124173
performance IQ	-.003768
full scale IQ	.072414
information	.005046
similarities	.098802
arithmetic	.042803
vocabulary	.145392
comprehension	.204180
digit span	-.129762
picture completion	-.145392
coding	-.068889
picture arrangement	.040776
block design	.004757
object assembly	.041062
reading	-.322031
math	-.051905
v>p	-.131364
p>v	-.087196

Table C 7

LD and ED Disability Groups

Means of Canonical Variables	
Group	Function 1
LD	.33750
ED	-1.02614

Table C 8

LD Student Service Delivery Models

STAT. Discriminant Function Analysis Summary (srk.sta)						
DISCRIM. No. of vars in model: 25; Grouping: VAR2 (2 grps)						
ANALYSIS Wilks' Lambda: .74330 approx. F (25,275)=3.7990 p< .0000						
N=301	Wilks' Lambda	Partial Lambda	F-remove (1,275)	p-level	Toler.	1-Toler. (R-Sqr.)
VAR3	.751358	.989270	2.982819	.085275	.041620	.958381
VAR4	.743380	.999886	.031307	.859687	.787042	.212958
VAR5	.743338	.999942	.015834	.899956	.106605	.893395
VAR6	.743651	.999522	.131556	.717102	.841140	.158860
VAR7	.755915	.983306	4.668727	.031580	.915786	.084214
VAR8	.748425	.993146	1.897913	.169432	.727867	.272133
VAR9	.757707	.980980	5.331788	.021681	.046863	.953137
VAR10	.746485	.995727	1.180172	.278272	.003316	.996684
NEWVAR11	.745635	.996862	.865656	.352977	.005572	.994428
NEWVAR12	.743659	.999511	.134572	.714020	.002578	.997422
NEWVAR13	.746537	.995658	1.199251	.274430	.073211	.926789
NEWVAR14	.754010	.985790	3.964067	.047471	.057083	.942917
NEWVAR15	.745609	.996897	.855887	.355703	.076129	.923871
NEWVAR16	.749005	.992377	2.112541	.147237	.072660	.927340
NEWVAR17	.743465	.999772	.062615	.802597	.060552	.939448
NEWVAR18	.743453	.999788	.058222	.809509	.760825	.239175
NEWVAR19	.743354	.999921	.021833	.882640	.090306	.909694
NEWVAR20	.746678	.995470	1.251343	.264272	.082825	.917175
NEWVAR21	.747510	.994362	1.559335	.212825	.077492	.922508
NEWVAR22	.744532	.998339	.457546	.499342	.073402	.926598
NEWVAR23	.745686	.996794	.884604	.347769	.076354	.923646
NEWVAR24	.766283	.970002	8.504680	.003834	.414245	.585755
NEWVAR25	.743308	.999982	.004819	.944706	.388503	.611497
NEWVAR26	.748867	.992560	2.061334	.152214	.595207	.404793
NEWVAR27	.743320	.999967	.009212	.923607	.542906	.457094

Note: See Table C 1 on Page 145 for Description of Variables.
 p-level < .05 for significance

Table C 9**LD Student's Service Delivery Model Discriminant Analysis**

Factor Structure Matrix Correlations Variables - Canonical Roots (Function) (Pooled-within-groups correlations)	
Variable	Function 1
age	.109870
age referred	-.114634
age tested	.109002
gender 1=m, 2=f	.016372
family comp 1= other , 2= intact	-.248194
parent educational level	-.447958
grade	.108009
verbal IQ	-.637267
performance IQ	-.470953
full scale IQ	-.637267
information	-.545468
similarities	-.637816
arithmetic	-.424807
vocabulary	-.600983
comprehension	-.343082
digit span	-.165648
picture completion	-.193804
coding	-.279319
picture arrangement	-.404777
block design	-.384793
object assembly	-.306391
reading	-.591792
math	-.492199
v>p	.001517
p>v	-.092536

Table C 10

LD Disability Group

Means of Canonical Variables	
Group	Function 1
Resource	-.289205
Self-contained	1.186234

Table C 11

ED Students Service Delivery Models

STAT. Discriminant Function Analysis Summary (srk.sta)						
DISCRIM. No. of vars in model: 25; Grouping: VAR2 (2 grps)						
ANALYSIS Wilks' Lambda: .46485 approx. F (25,73)=3.3616 p< .0000						
N=99	Wilks' Lambda	Partial Lambda	F-remove (1,73)	p-level	Toler.	1-Toler. (R-Sqr.)
VAR3	.484220	.960001	3.04162	.085364	.112720	.887280
VAR4	.470403	.988198	.87186	.353518	.560573	.439427
VAR5	.533991	.870523	10.85765	.001520	.168362	.831638
VAR6	.476188	.976193	1.78031	.186258	.713145	.286855
VAR7	.465710	.998156	.13484	.714526	.706127	.293873
VAR8	.532678	.872669	10.65141	.001675	.605299	.394701
VAR9	.487657	.953233	3.58148	.062392	.095394	.904606
VAR10	.469999	.989047	.80842	.371543	.002476	.997524
NEWVAR11	.505338	.919881	6.35805	.013867	.003815	.996185
NEWVAR12	.492788	.943309	4.38711	.039683	.001053	.998947
NEWVAR13	.464927	.999837	.01190	.913447	.214576	.785424
NEWVAR14	.471006	.986932	.96661	.328773	.150152	.849848
NEWVAR15	.479153	.970153	2.24587	.138284	.177815	.822185
NEWVAR16	.496179	.936862	4.91969	.029663	.121156	.878844
NEWVAR17	.465768	.998032	.14394	.705501	.155918	.844082
NEWVAR18	.467069	.995253	.34821	.556949	.546981	.453019
NEWVAR19	.477793	.972914	2.03233	.158246	.227524	.772476
NEWVAR20	.464921	.999851	.01089	.917187	.407150	.592849
NEWVAR21	.464857	.999987	.00095	.975514	.389302	.610698
NEWVAR22	.515981	.900907	8.02947	.005947	.255297	.744703
NEWVAR23	.470391	.988223	.86995	.354044	.320693	.679307
NEWVAR24	.468898	.991370	.63548	.427936	.374788	.625212
NEWVAR25	.465711	.998154	.13503	.714333	.356535	.643465
NEWVAR26	.524316	.886586	9.33834	.003133	.345437	.654563
NEWVAR27	.470864	.987229	.94431	.334381	.421692	.578308

Note: See Table C 1 on Page 145 for Description of Variables.
p-level < .05 for significant

Table C 12

ED Student's Service Delivery Model Discriminant Analysis

Factor Structure Matrix Correlations Variables - Canonical Roots (Pooled-within-groups correlations)	
Variable	Function 1
age	-.278575
age referred	-.056090
age tested	-.108850
gender 1=m, 2=f	-.026849
family comp 1= other , 2= intact	-.147936
parent educational level	-.272344
grade	-.309495
verbal IQ	-.357439
performance IQ	-.265425
full scale IQ	-.350786
information	-.375482
similarities	-.306451
arithmetic	-.224217
vocabulary	-.262773
comprehension	-.237621
digit span	-.205114
picture completion	-.128906
coding	.002024
picture arrangement	-.142698
block design	-.345935
object assembly	-.173235
reading	-.295107
math	-.259986
v>p	-.026249
p>v	-.107895

Table C 13

ED Disability Group

Means of Canonical Variables	
Group	Function 1
Resource	-1.53678
Self-contained	.73398

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EDUCATION:

1991-1996 **Virginia Tech, Blacksburg, Virginia**

Major: Counseling/School Psychology
Degree: Doctor of Philosophy (Ph.D.)
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1985-1988 **James Madison University, Harrisonburg, Virginia**

Major: School Psychology
Degree: Educational Specialist Degree (Ed. S.)

1982-1985 **James Madison University, Harrisonburg, Virginia**

Major: Counseling Psychology
Degree: Masters of Arts

1983-84 **George Mason University, Fairfax, Virginia**

Major: Course work in School Administration and Supervision

1981 **City University of New York, Baruch College**

Major: Psychology
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PROFESSIONAL

EXPERIENCES:

Clarke County Public Schools, Berryville, Virginia

1991-Present

Director of Instructional/Pupil Personnel Services

Responsibilities include supervision and administration of special education and substance abuse prevention programs, social work, counseling, psychological, and health services. Additional responsibilities include the coordination of K-12 instructional and testing programs.

University and College Teaching Experience

1990 - Present

Taught graduate classes in the following areas: Advanced Study of Exceptional Individual, Psycho-educational Assessment of Learning and Behavioral Problems, Evaluation and Appraisal Procedures in Counseling, and Tests and Measurements.

Warren County Public Schools, Warren County, Virginia

1988-1991

School Psychologist - Administrative

Responsibilities include curriculum development, psychological evaluation, counseling, staff training consultation, data collection, record keeping, and specialized student programming.

Other Experiences

1981-1988

Counseled and taught students with emotional and learning disabilities

RELATED EXPERIENCES:

Internship supervisor for James Madison University School Psychology Program.

Presented at the 1996 Virginia Psychological Association Conference. TOPIC: Understanding Children and Adults with Learning Disabilities and Attention Deficit Disorders

Presented at the 1995 National Pupil Services Administrative Conference. TOPIC: Leadership Skills.

Presented at the 1995 Virginia Psychological Association Conference. TOPIC: School Psychologist as Leaders and ED, LD - What's the Difference?

Presented at the 1995 State Conference for the Virginia Council for Administrators for Special Education. TOPIC: Working with emotionally disturbed students in the classroom.

Presented at the 1995 National Effective Schools Conference in Arizona. TOPIC: High expectations for students with disabilities.

Presented at the 1993 Governor's Conference on Education. TOPIC: Including special education students in regular education programs.

Presented at the 1990 Governor's Conference on Education. TOPIC: Developing a school-wide crisis intervention program.

Conducted regional workshops on understanding and working with children with emotional and behavioral problems, Attention Deficit Disorders, and Learning Disabilities.

PROFESSIONAL AFFILIATIONS:

Virginia Department of Education License - School Psychology
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Association for Retarded Citizens
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