©1985 Rhoda Elizabeth Cummings

HOLLAND PERSONALITY TYPES AMONG LEARNING DISABLED
AND NONLEARNING DISABLED HIGH SCHOOL STUDENTS

by

RHODA ELIZABETH CUMMINGS, B.A., M.Ed.

A DISSERTATION

IN

EDUCATION

Submitted to the Graduate Faculty
of Texas Tech University in
Partial Fulfillment of
the Requirements for
the Degree of

DOCTOR OF EDUCATION

Approved

May, 1985

13
1985
15.6
Cof.

ACKNOWLEDGEMENTS

I wish to express my sincere thanks to the members of my doctoral committee, Dr. Cleborne Maddux, Dr. Gerard Bensberg, Dr. LaMont Johnson, Dr. Shamus Mehaffie, Dr. John Nevius, and Dr. Jane Winer, for their professional support and guidance.

I also wish to express my gratitude to the administration, faculty, and students of the Lubbock Independent School District whose cooperation and assistance made this study a reality.

I wish to express a special thanks to Dr. Cleborne Maddux, major advisor, whose wisdom, scholarly expertise, and academic integrity have exemplified the ideals of academia.

Finally, I wish to thank my parents, Madge and Lloyd Woods, for their support, and my children, Carter and Courtney, for their patience.

CONTENTS

ACKNOWLEDGEMENTS.....	ii
LIST OF TABLES.....	v
I. INTRODUCTION.....	1
Statement of the Problem.....	1
Research Problem.....	8
Contributions of the Study.....	11
II. REVIEW OF LITERATURE.....	12
Introduction.....	12
Definition of Learning Disabilities.....	13
Career Education: A Rationale.....	21
Career/Vocational Assessment.....	28
Interest and Personality Inventories.....	32
Career Education for the Handicapped.....	36
Vocational Assessment of the Handicapped..	48
Career Development Theory and the Handicapped.....	58
The Holland Theory of Vocational Personalities and Work Environments.....	61
Summary Statement.....	75
III. METHODOLOGY.....	77
Subjects.....	78
Sampling Procedure.....	79
Instruments.....	82
Procedures.....	87

Design.....	89
IV. RESULTS.....	92
Descriptive Data.....	92
Chi-Square Test of Homogeneity.....	94
Coefficients of Equivalence and Stability.....	98
Comparison of Errors Made by NLD and LD Groups on the SDS and the SDS-E.....	104
V. SUMMARY.....	110
Statement of the Problem.....	112
Review of the Literature.....	114
Subjects.....	115
Sampling Procedure.....	116
Instruments.....	117
Results.....	117
Implications.....	121
REFERENCES.....	126
APPENDICES.....	138
A. DATA SHEET.....	139
B. STANDARDIZED INSTRUCTIONS.....	140

LIST OF TABLES

1. Chi-Square And Observed and Expected Frequencies for Holland High-Point Codes of LD and NLD Students.....	96
2. Coefficients of Equivalence and Stability.....	100
3. Tests for the Difference Between Correlation Coefficients for Uncorrelated Data, LD vs NLD Groups.....	101
4. Crossbreak Tables for Errors on the SDS and the SDS-E.....	106
5. Crossbreak Tables for Errors Changing High-Point Codes on SDS and SDS-E.....	108

CHAPTER I

INTRODUCTION

Statement of the Problem

In 1968 the National Advisory Committee on the Handicapped of the U.S. Office of Education described certain children with normal intelligence who were not learning in school as having specific learning disabilities. More recently, Public Law 94-142 has defined Specific Learning Disability as:

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

Today, many children identified as learning disabled in the 1960's have grown up, left the public schools, and are attempting to become integrated into adult society. However, as the literature has recently begun to show, large numbers of these individuals continue to suffer from the effects of their disability (Cox, 1977; Crimando & Nichols, 1982; Cruickshank, 1980;

Deshler, 1978; Fafard & Haubrich, 1981; Gray, 1981; New York ACLD Interim Report, 1982; White, Deshler, Schumaker, Warner, Alley, & Clark, 1983). In fact, for many of them, their handicap has become even more of a problem as they have grown older. Researchers are now beginning to look at some of the problems being encountered by this group after they leave school, and they are discovering some alarming facts.

In 1981, Sitlington found that public schools were not adequately preparing learning disabled students for adult living in terms of independent living and employment. According to Fafard and Haubrich (1981), many learning disabled individuals are leaving schools unprepared either for college, vocational/technical school, or employment. They often have difficulty finding employment, and if they do find a job, they often cannot keep it because of their poor work habits and inadequate interpersonal skills. Crimando and Nichols (1982) state that learning disabled individuals may become victims of an invisible handicap which neither they nor their employers understand. They may live their lives in frustration, isolation, depression, and at levels far below their potential. If they do find and keep employment, it may be in dead-end jobs which are boring and do not make use of their full capabilities.

From these and other studies (Geib, Guzzardi, & Genova, 1981; Kendall, 1981), it is becoming increasingly apparent that many learning disabled adults are not faring well once they leave school. As a result, the public schools are beginning to recognize that academic remediation alone will not solve the problems of this handicapped group. Because of this realization, some initial attempts are being made to provide learning disabled students with vocational as well as academic instruction. However, many of these programs are often inappropriate. Instead of developing vocational programs suited to the unique needs of learning disabled students, schools are often placing these students into vocational programs which are designed either for nonhandicapped students or for mentally retarded students (Cummings & Maddux, 1984).

The regular vocational programs are often inappropriate for learning disabled students for several reasons: (1) instructors usually have no expertise in special education and the specific needs of learning disabled students, (2) the curriculum is designed for nonhandicapped students and may prove too difficult for many learning disabled students, and (3) because so many learning disabled students have difficulty with reading, they may not be able to pass the safety tests required in many of the courses (Dahl, 1978; McDaniel, 1982;

Washburn, 1975).

On the other hand, vocational programs designed for mentally retarded students often train students for low-level jobs which most learning disabled students would find tedious and unchallenging (Cummings & Maddux, 1984; Sitlington, 1981).

While nonhandicapped individuals often have a variety of choices of work environments, learning disabled individuals often do not. Because of inappropriate vocational preparation (if there were any at all), many post-secondary learning disabled students are often in work settings which are not suited to their abilities, interests, and personalities (Crimando & Nichols, 1982; White et al., 1983). This lack of an appropriate work setting may be one explanation for their reported unsuccessful occupational experiences.

The vocational literature suggests that an individual's personality and interests are important determiners of the occupations in which a person will experience job satisfaction and success (Holland, 1985; Osipow, 1983; Norris, Hatch, Engelkes, & Winborn, 1979). Perhaps if we considered learning disabled individuals as having personalities and vocational interests as varied as those of nonhandicapped individuals, we would be more likely to train them for occupations suited to their interests and in which they can experience success

and satisfaction.

One traditional way of tapping an individual's vocational interests is through the administration of vocational interest inventories. Although interest inventories are routinely administered to high school students, little thought has been given to their applicability for handicapped populations. However, use of interest inventories with handicapped persons might provide valuable information in terms of more appropriate vocational preparation and training.

One vocational interest inventory which might be applicable for use with learning disabled students is the Self-Directed Search developed by John Holland and first published in 1970. The instrument was developed out of Holland's theory of vocational personalities and work environments. Holland suggests that an individual's career choice reflects to a great extent that person's personality and behavioral styles (Osipow, 1983). According to Holland, we can characterize people by their resemblance to one of six personality types--Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Holland also characterizes work environments by their resemblance to six model environments--Realistic, Investigative, Artistic, Social, Enterprising, and Conventional.

According to Holland (1985), Realistic types tend to be asocial, conforming, inflexible, and uninsightful. They prefer physical, highly concrete activities and avoid abstract problem situations. A Realistic environment stimulates realistic activities such as using machines and tools.

Investigative types tend to be analytical, intellectual, complex, and precise. They prefer activities which involve abstract problem-solving, organizing, and understanding. The Investigative environment requires abstract problem-solving skills and a scientific curiosity.

Artistic personalities are complicated, disorderly, emotional, expressive, and imaginative. Artistic environments reward people for display of artistic abilities and would include the theater, dance companies, and art studios.

Social types are cooperative, friendly, helpful, warm, and understanding. Social occupations include teaching, counseling, and social work.

Enterprising personalities are adventurous, ambitious, energetic, self-confident, and extroverted. Enterprising environments reward people for the display of enterprising values and goals such as money, power, and status. Such environments would be sales occupations, corporations, and political occupations.

Conventional personalities are careful, conforming, conscientious, orderly, and methodical. They do well in structured occupations such as accounting, clerical work, and school administration.

According to Holland, job satisfaction and stability occur more often if personality type and work environment are congruent - that is, a Realistic type is happier in a Realistic work environment.

In order to test his theory, Holland first developed the Vocational Preference Inventory (VPI) in 1953. As a result of research findings from the VPI, Holland has refined and revised his theory.

In 1970, Holland developed a second personality/interest inventory, the Self-Directed Search. To use the SDS, a person fills out the assessment booklet and obtains a three-letter occupational code with the first letter of the code indicating the predominant type.

More than 400 studies have been done with the SDS, and it has proved to be an effective instrument to determine vocational interests and predict job success (Holland, 1985; Osipow, 1983).

Holland's theory may have implications for predicting job success of handicapped individuals. It may be that we tend to have stereotypic views of appropriate work environments for handicapped

individuals and place them in work settings according to those views.

In 1984, Plue studied job types of 3,177 mildly retarded individuals in the state of Mississippi. Service occupations including Structural Work, Bench Work, Processing Operations, and Miscellaneous accounted for 82% of handicapped employment. For purposes of the present proposed study, these job titles were located in the Dictionary of Holland Occupational Codes (Gottfredson, Holland, & Ogawa, 1982). Without exception, the predominant Holland code assigned to occupations in each of these five work clusters is R, or Realistic.

It is obvious from Plue's findings that mildly retarded individuals are working in environments which are predominantly Realistic. Is this because mildly handicapped individuals, including those with learning disabilities, tend to have Realistic personalities, or are they being stereotyped as Realistic types when, in fact, their personalities and interests may be much more diverse?

Research Problem

Learning disabled adults do not seem to be as successful vocationally as nonhandicapped adults. Studies examining job stability and success indicate that vocational satisfaction, stability, and achievement

depend on compatibility between an individual's personality and the environment in which that individual works (DeVoge, 1975; Gottfredson, 1977; Mount & Muchinsky, 1978; Wiggins, 1976). It may be that learning disabled adults are not doing well vocationally because they are occupationally stereotyped in a manner which is incongruent with their vocational personalities. Job training programs for learning disabled individuals are similar to those for mentally retarded persons (Sitlington, 1981). They may prepare participants for jobs which fit a constricted stereotypic view of these individuals' abilities and interests rather than for jobs which are actually congruent with their personalities.

Although nonhandicapped individuals have traditionally been considered as having a variety of occupational interests (Campbell, 1974; Holland, 1985; Kuder, 1966), the same has not been true for handicapped persons. If learning disabled individuals have as much variety of vocational interests as nonhandicapped individuals, then vocational programs should consider those interests in terms of occupational training and counseling approaches. One way to determine personality and vocational interests is by administering occupational interest inventories such as Holland's Self-Directed Search.

Because the SDS was developed for use with nonhandicapped individuals, learning disabled students may have more difficulty with test items than nonhandicapped students. Holland has designed a simpler form of the SDS--the SDS-E--for adults and adolescents who are poor readers (Holland, 1979). The SDS-E is slightly shorter than the SDS, the directions include only fourth-grade words, and the scoring is simplified. To date, studies on the effectiveness of the SDS-E are virtually nonexistent. Holland (1979) assumes, because of the large item overlap, that the two forms have about equal validity. In 1979 Wirtenberg (cited in Holland, 1979) obtained Alpha coefficients indicating that the subscales of Form E have moderate to high reliability and that these reliability coefficients do not differ substantially from the reliabilities obtained for the full scales in the regular form. Finally, Winer, Wilson, and Pierce (1983) conducted an exploratory study of SDS-E use with 44 remedial reading students and determined that the SDS-E might be a useful counseling tool for reading deficient high school students.

Since learning disabled students find learning easier with modified environments and curricula (Meyen, 1978; Kirk & Gallagher, 1983), the SDS-E may be more appropriate than the SDS to use with this group.

Contributions of the Study

Learning disabled adults do not seem to be as successful vocationally as nonhandicapped adults (Cox, 1977; White et al., 1983). One reason for their lack of success may be that they are working in occupations which are not congruent with their personalities and interests. While nonhandicapped individuals are considered to have a variety of occupational interests, the same has not been true for learning disabled individuals. Therefore, they are often slotted into occupations without consideration of their interests and personalities.

This study will investigate whether learning disabled students have vocational interests and personalities as different as those of nonlearning disabled persons. If such differences are found to exist, then vocational programs should consider those interests in terms of occupational training and counseling approaches for learning disabled students.

The study will also consider whether or not the SDS-E is more appropriate than the SDS for use with learning disabled students. If the SDS-E is found to be more appropriate than the SDS, then professionals should consider it an effective counseling tool for use with learning disabled persons.

CHAPTER II

REVIEW OF LITERATURE

Introduction

More and more evidence indicates that learning disabled adolescents and adults frequently are failing to make adequate postsecondary adjustment in terms of interpersonal skills, independent living, and work (Cox, 1977; Geib, Guzzardi, & Genova, 1981; Gray, 1981).

One reason for this lack of adjustment may be that public schools have not developed appropriate secondary programs for most learning disabled students (White, Deshler, Schumaker, Warner, Alley, & Clark, 1983; Faford & Haubrich, 1981). Most secondary LD programs follow the elementary school model of remediation of academic skills (Cummings & Maddux, in Press). Vautour, Stocks, and Kolek (1983) suggest that the emphasis of PL94-142 on educating handicapped students in the least restrictive environment resulted in educators concentrating on modifying the regular school curriculum. They make the following comment:

We were simply operating on the basis of a false assumption, namely, that mastery of a modified regular curriculum would automatically guarantee successful employment. Only upon closer examination did the truth surface. These students additionally needed specific assistance in the area of career exploration and vocational preparation if they were to be employable. (p. 54)

One reason many learning disabled individuals are not coping well as adults may be that public schools have failed to provide them with appropriate career/vocational education. The purpose of this chapter is to review the literature pertaining to appropriate career/vocational programming for learning disabled students. This review will be divided into seven sections including:

1. Definition of Learning Disabilities
2. Career Education: A Rationale
3. Career/Vocational Assessment
4. Career Education for the Handicapped
5. Career/Vocational Assessment of the Handicapped
6. Career Development Theory and the Handicapped
7. Holland's Theory of Vocational Choice

Definition of Learning Disabilities

There is increasing evidence that learning disabled individuals are not faring well once they leave school (White, Deshler, Schumaker, Warner, Alley, & Clark, 1983). They are often employed in low-level, unskilled jobs (Crimando, 1982; Washburn, 1975), have difficulty establishing positive relationships with employers and co-workers, and many of them remain at home much longer than do their nonhandicapped peers (Fafard & Haubrich, 1981).

In response to this problem, there is currently

increasing interest in developing public school vocational programs for exceptional children, particularly for learning disabled students. Such programs are difficult to design and implement, and public schools have been slow to attempt to do so (Cummings & Maddux, in Press).

One of the primary problems in developing appropriate vocational programs for learning disabled students is the lack of a coherent research- and theory-based operational definition of learning disabilities. This lack has resulted in very large numbers of children being identified as learning disabled. Partly because of this over-identification, these large groups of children are also extremely heterogeneous (La Greca, 1982).

This may not seem surprising since it is commonly stated that learning disability is a heterogeneous condition (Bryan, 1978). However, what is usually meant by this statement is that there is a wide variety of deficits exhibited by learning disabled children. Some LD children, for example, have deficits in auditory sequential memory, others have problems in fine-motor skills, others are deficient in auditory figure-ground discrimination, etc. The problem at the present time, however, is that the heterogeneity commonly found in groups of children who have been labeled learning

disabled is probably not due to great variance in the nature of component deficits, or pathologies which reside primarily within each child. Rather, the heterogeneity is primarily due to great variance in the environmental causes of academic underachievement.

The result is that most children who are labeled LD by school districts have met only one criterion, that of underachievement. The diverse causes of this underachievement may include learning disabilities, but many more of these children have simply not mastered the school curriculum because of such factors as lack of motivation, poor teaching, irregular attendance, frequent moves from city to city, etc. Such children obviously need help, but they are not learning disabled children in the strict sense. The difference is crucial. A pathological condition obviously may lead to a learning problem, but the reverse is not necessarily true. Learning disabled children are often underachievers; underachievers are not always learning disabled. That such a distinction even needs to be expressed indicates the seriousness of the present dilemma.

The large numbers of children who are now labeled LD and the great heterogeneity in LD classes makes it difficult to design and implement useful vocational programs, either for the majority of children who are

underachievers for a variety of environmental causes, or for the minority who are underachievers because they are truly learning disabled.

Regular vocational programs do not work since they were designed for children with intact academic skills who are motivated to succeed in school. Intensive special education techniques have not been employed for two reasons. First of all, vocational teachers seldom have the knowledge or training, and often lack the inclination, to individualize their vocational courses to make them consistent with the true LD child's specific abilities and disabilities. Secondly, since there are so many children in LD classes who are not truly learning disabled, vocational programs which employ intensive special education techniques would be inappropriate for the majority of children in such groups.

Underachievement has not always been the sole criterion for identification of learning disabilities. The condition has been known for many years under a variety of labels including brain injury, minimal brain dysfunction (MBD), aphasia, dyslexia, and a host of others (Kirk & Chalfant, 1984). The term learning disabilities became popular in 1963 when, at a joint meeting of the Fund for Perceptually Handicapped Children and the National Orthopsychiatric Association,

Samuel Kirk suggested the term learning disabilities (Siegel & Gold, 1982) be used to describe affected children (Siegel & Gold, 1982). Kirk defined learning disabilities as follows:

A learning disability refers to a retardation, disorder, or delayed development in one or more of the processes of speech, language, reading, spelling, writing, or arithmetic resulting from a possible cerebral dysfunction and/or emotional or behavioral disturbance and not from mental retardation, sensory deprivation, or cultural or instructional factors. (Kirk, 1962, p. 263)

Since 1963, there have been other attempts to define learning disability. However, revised definitions have remained remarkably similar to this early conceptualization. The condition is currently referred to as specific learning disability in federal regulations, and the definition is as follows:

Specific learning disability 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 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, or of environmental, cultural, or economic disadvantage. (Federal Register, August 23, 1977)

While the definition of a handicapping condition is important, the operationalizing of the definition in terms of its use for identification and diagnostic procedures is even more crucial. Although accepted

definitions of learning disabilities have varied since the 1960's, the operational definition has not varied greatly. It has traditionally made use of three basic criteria, all of which should be satisfied before a diagnosis of learning disabilities can be made: (a) the discrepancy criterion, (b) the process deficit criterion, and (c) the exclusion criterion. These will be discussed in turn.

The Discrepancy Criterion

The discrepancy criterion requires that the child demonstrate a significant discrepancy between ability and academic achievement. In other words, evidence is required that the child is capable of achieving more than he actually is achieving in one or more academic areas. Thus, the discrepancy requires that the child be an underachiever.

There are many problems with use of the discrepancy criterion for diagnosing learning disabilities. Some of these problems are statistical in nature (Ysseldyke, 1977, 1978). Other problems are philosophical.

These problems include (a) determining how large the discrepancy can be before it is considered significant; (b) deciding which academic areas to include when determining whether or not a child demonstrates a significant discrepancy between ability and achievement; (c) the implicit assumption that a

direct relationship exists between ability and achievement; and (d) the assumption that both ability and achievement can be accurately and reliably measured.

The Process Deficit Criterion

The process deficit criterion has been even more controversial than the discrepancy criterion. This criterion requires that the child be shown to have a deficit in one or more of the basic psychological processes. A major problem has always been that while most authorities agree that basic psychological processes do indeed exist, there is little agreement as to what these processes are or how to measure them.

The Exclusion Criterion

The exclusion criterion simply requires that the child's primary problem not be because of other conditions such as visual, hearing, or motor handicaps, mental retardation, or environmental, cultural, or economic disadvantage.

One problem with this criterion involves children who have learning disabilities and another handicapping condition such as emotional disturbance. In such cases, it must be shown that the child's primary problem is the learning disability rather than the emotional disturbance. This requirement frequently presents a

dilemma since it may be difficult or impossible to say which came first, or which is primary. However, in spite of these problems, districts frequently use the exclusion criterion to label underachieving children learning disabled when it is impossible to prove any other handicapping condition exists.

Conclusions

Many school children are labeled learning disabled for a variety of reasons. In many instances, children are labeled learning disabled who are underachieving because of environmental problems rather than because they are handicapped. In fact, DeLoach, Earl, Brown, Poplin, and Warner (1981) reported that approximately 30% of students in learning disability classes were not considered by their teachers to be learning disabled.

Because so many students are inaccurately labeled learning disabled and because of the heterogeneity of such large groups of children, it is difficult to design beneficial remedial and vocational programs suited to the specific needs of those children who have the handicap of learning disability. Consequently, many of these students are being inappropriately served by the public schools. Neither are they being adequately prepared for adult living once they leave the public schools.

Career Education: A Rationale

Learning disabled students often do not receive adequate career/vocational training. One solution to this problem is to design career/vocational programs suited for the specific learning needs of learning disabled students. If appropriate career/vocational programs are to be made available to these students, those who develop such programs must have an understanding and knowledge of the development of traditional career education.

Historical Development of Career Education

Kokaska (1983) states that the roots of career education can be traced to the work of Richard Hungerford in the New York City school system in the 1940's and to the work-study programs developed by Kolstoe and Frey (1965). However, career education was first officially introduced to American educators in 1971 by the U.S. Commissioner of Education (Marland, 1971) at a national conference of secondary school principals (Brolin, 1978; Brolin & D'Alonzo, 1973). At that time, educators were concerned with the large numbers of students who were either dropping out of school or who were graduating without being adequately prepared for work. In his address, Marland pointed out that nearly 2.5 million students were leaving school each year without the necessary skills to enter

employment (Marland, 1971). Education officials attributed these problems to students' failure to see the relevance of what they were being taught to their future life goals (Brolin, 1978).

In response to these discouraging statistics, many educators voiced the need for a more practical and meaningful approach to education. To provide this approach, career education was introduced (Brolin, 1978). According to Brolin, Elliot, and Corcoran (1984):

It was believed that the introduction of the career education approach would bring greater relevance and meaning to being in school and that students would become more aware of themselves, their potentials, and the type of career that they could assume later on as responsible adults. (p. 1)

In an effort to make education more relevant to today's economic and employment realities, career education emphasizes relating academic subject matter to various careers and occupations; developing work skills appropriate for present occupational demands; the respectability of all work; and stressing the value of avocational work (Cegelka, 1985). According to Cegelka, career education has "sought to increase the life satisfaction of workers, restore the work ethic, and increase national productivity" (p. 575).

Unfortunately, not all goals of career education have been achieved. Many of the early concerns of proponents of career education continue to be voiced

today. Findings of the National Assessment of Educational Progress (1978a; 1978b) revealed that only 2% of 34,000 high school students surveyed considered public education effective in preparing them for work. Also, these students had not acquired necessary skills such as measuring, computing costs, filling out job applications, and critical thinking. Investigators also judged their occupational aspirations to be unrealistic.

According to Siccone (1983), American schools are graduating students with all-time low achievement levels at the same time society is moving into an information-based age of high technology. In addition, the Carnegie Council of Policy Studies in Higher Education (Kerr, 1979) reported that nearly one third of high school-aged individuals were ill-employed, poorly educated, and incapable of functioning in society. In some communities, school dropout rates were as high as 23% for Caucasians, 35% for Blacks, and 45% for Hispanics. Irrelevant school curricula was cited as the primary cause for the high rates of student dropout.

Legislation and Career Education

During the late nineteenth and early twentieth centuries, industrialization, increased immigration, and greater numbers of students in secondary schools resulted in demands for public school vocational education programs (Cegelka, 1985). Because of these

demands, laws were passed providing for vocational education in the secondary schools.

The first of these laws was the Smith-Hughes Act of 1917, the first law to make federal monies available for vocational education. The Vocational Education Act of 1963 extended vocational education services to include individuals who had left school, who needed vocational training to gain entry into the job market or to maintain or advance in present jobs, and who had academic, socioeconomic, or other handicaps that prevented them from succeeding in regular vocational education programs. According to Cegelka (1979):

This emphasis on the needs of individuals represents a fundamental philosophical shift in the approach of Congress to vocational education. While the Smith-Hughes Act of 1917 focused on the needs of employers, the Vocational Education Act of 1963 emphasized the importance of vocational skills to workers as a means of insuring their own welfares. (p. 163)

The 1968 Amendments to the Vocational Act of 1963 specified that monies be set aside for the provision of vocational education programs for handicapped and disadvantaged students. The 1968 Amendments also defined the term handicapped for vocational education. Most categories of handicapped students were included with the exception of learning disabilities. The 1976 Amendments included learning disabled students as eligible for services. They also specified that handicapped children be included in regular vocational

education programs with special assistance and equipment being provided as needed.

Federal legislation has also addressed the need for vocational guidance. In 1962, the Economic Assistance Act specified the need for effective career counseling as part of its various programs including Job Corps, VISTA, etc. The 1964 Amendments to the National Defense Education Act encouraged educational agencies to provide counseling and guidance to assist students in achieving appropriate career development. Finally, the 1968 Higher Education Act amendments provided for the training of school guidance counselors.

Career Education Defined

No standard definition of career education exists (Brolin, 1983). In 1975, the official U.S. Office of Education defined career education as "the totality of experience through which one learns about and prepares to engage in work as part of her or his way of living" (Hoyt, 1975, p. 4). While some people interpret this definition to include voluntary work, productive use of leisure time, and the unpaid work of homemakers and students (Kokaska, 1983), others interpret it as emphasizing preparation for paid employment (Brolin & D'Alonzo, 1973).

Other definitions take a broader view of career education (Gysbers & Moore, 1975; Hansen, 1977; Super,

1976). These specify that a career encompasses many different roles including occupational, social, leisure, and interpersonal. Others describe a job as only one part of a person's career. Goldhammer (1972) discusses several "careers" in which individuals become engaged. These are "1) producer of goods and renderer of services; 2) member of a family group; 3) participant in social and political life; 4) participant in avocational pursuits; and 5) participant in the regulatory functions involved in aesthetic, moral and religious concerns" (p. 129.)

More recently, Hoyt (1977) recognized broader roles in one's career pattern when he defined career education as:

An effort aimed at refocusing American education and the actions of the broader community in ways that will help individuals acquire and utilize the knowledge, skills, and attitudes necessary for each to make a meaningful, productive, and satisfying part of his or her way of living. (p. 5)

Finally, the official position statement of the Council for Exceptional Children (1978) describes career education as follows:

The totality of experiences through which one learns to live a meaningful life....providing the opportunity for children to learn, in the least restrictive environment possible, the academic, daily living, personal-social and occupational knowledge and skills necessary for attaining their highest level of economic, personal, and social fulfillment. The individual can obtain this fulfillment through work (both paid and unpaid) and in a variety of other societal roles and personal lifestyles.

Vocational vs Career Education

One commonly-held misconception is that vocational education and career education are the same thing.

Kokaska (1983) points out the difference in the two concepts by defining vocational education as including training in a wide variety of specific technical skills essential in performing work roles. He states,

This training is supervised by specialists who qualify for such occupational areas as accountant, secretary, or electrician. Training begins at the secondary level and is defined in terms of courses within an instructional program. (p. 194)

He defines career education, on the other hand, as encompassing all levels of the school system, involving all teachers, and promoting cognitive, affective, and psychomotor skill development.

Cegelka (1985) defines career education as being a much broader concept than vocational education. She explains that career education encompasses vocational education, work attitudes, and skills at the secondary and post-secondary levels while the purpose of vocational education is to provide specific vocational skill training and vocational adjustment. She stresses that "career education is concerned with the quality of the individual's total life adjustment" (p. 601).

Conclusions

In 1971, the concept of career education was introduced to meet the educational needs of large numbers of students who were dropping out of school because of what they considered to be a lack of relevancy in education. Since that time, many individuals and groups have endorsed the concept. However, just as many others have resisted including career education in the curriculum. That resistance has intensified in the last year or two with the recent emphasis on upgrading the quality of education and stressing the teaching of academics. However, as Brolin and D'Alonzo (1983) point out:

Career education is a total educational concept. It is not intended to replace present educational practices, as some seem to believe, but rather to help make all instructional material personally relevant by restructuring it around a career development theme....Career education brings meaning to the curriculum by making individuals more aware of themselves, their potentials, and their educational needs. (p. 97)

Career/Vocational Assessment

One of the crucial phases in developing quality career/vocational education programs is that of student assessment (Phelps & McCarty, 1984). Career/vocational assessment, work evaluation, vocational assessment, and vocational evaluation are sometimes used interchangeably, although there are some slight distinctions among each of them in the literature

(Levinson, 1984).

Levinson defines work evaluation as the process of identifying an individual's physical, mental, and emotional abilities for the purpose of predicting employment potential and adjustment. He states that these abilities are measured by "standardized tests, job sampling, job trait, and other specialized techniques and procedures" (p. 114). Neff (1970) defines four major approaches to vocational assessment including assessment of intellectual abilities, job analysis, work sampling, and situational assessment. Sitlington and Wimmer (1978) define vocational assessment as "A continuous process of obtaining information about student performance in areas related to the world of work" (p. 85), and Botterbusch (1976) describes vocational assessment as "The process of assessing a person to determine the specific nature of his or her aptitudes, skills, characteristics, and work-related behaviors" (p. 2). Finally, the Tenth Institute on Rehabilitation Services (1972) reports that vocational assessment is a comprehensive process that systematically uses work, real or simulated, as the focal point for vocational exploration to assist individuals in vocational development.

Much has also been written describing the purposes of vocational assessment. Sankovsky (1970) sees vocational evaluation as incorporating assessments of

intellectual potential, present work skills, expected work skills, physical capacity, work behavior, and academic achievement. Peterson (1981) stresses that vocational assessment is useful for (a) determining if students have prerequisite skills for enrolling in various vocational programs; (b) providing vocational teachers with useful information about students; (c) determining effective teaching techniques and instructional modifications for special students; (d) providing a means of communication between special and vocational educators. According to Pruitt and Longfellow (1970), the function of vocational evaluation should be to assess physical and intellectual development, personality and attitude, occupational readiness, and role identity.

Finally, Hoffman (1973) emphasizes that vocational evaluation should include assessment of (a) general employability factors including social skills, personal hygiene, work attitudes, physical ability, and rate of on-the-job performance; and (b) specific employability factors including specific vocational skills, aptitudes, and dexterity; academic achievement; intelligence; and interests and personality.

Vocational Assessment Procedures

Vocational assessment is a necessary component of any successful career/vocational education program.

According to Phelps and McCarty (1984), vocational assessment activities should be ongoing and should parallel the career development process and the transition from school to work. These authors state that general ongoing assessment activities include cumulative data review; interviews of peers, parents, and teachers; and psychometrics. When students begin to explore different occupations, assessment activities such as work samples and production work should begin. Once students develop critical prevocational skills, assessment activities should include monitoring students at simulated job stations and at on-the-job training sites.

Conclusions

Many high school graduates are not succeeding in the workplace. One reason for this lack of success may be that public schools are not preparing them adequately for work. One way to improve students' chances for success is through the establishment of quality career/vocational education programs. One important component of such programs is vocational assessment. Data derived from vocational evaluation can provide professionals with pertinent information that can be to help students develop vocationally.

Interest and Personality Inventories

Interest Inventories

Interests are often important determiners of the occupations that a person will enjoy and be successful at (Norris, Hatch, Engelkes, & Winborn, 1979). Swanson and Watson (1982) maintain that vocational interest inventories provide examiners with an understanding of an individual's work orientation and level of vocational maturity. Many interest inventories are self-scored and provide the student with immediate feedback about his or her vocational interests.

Some examples of commonly used interest inventories are the Kuder Occupational Interest Inventory, the Strong-Campbell Interest Inventory (SCII), the Wide Range Interest Opinion Test (WRIOT), the Ohio Vocational Interest Survey (OVIS), the Geist Picture Interest Inventory, Revised, the Career Maturity Inventory (CMI), the Minnesota Vocational Interest Inventory (MVII), the Career Awareness Inventory (CAI), and the AAMD-Becker Reading Free Vocational Interest Inventory designed as a systematic, nonreading, vocational preference test for use with mentally retarded individuals. While these instruments are often useful for nonhandicapped groups, and a few are useful for mentally retarded individuals, none are intended for, normed with, nor have been used

extensively with learning disabled persons.

Personality Inventories

Vocational interests are closely related to personality (Holland, 1985; Swanson & Watson, 1982). In fact, personality and interest inventories both may sometimes be measures of personality. Personality inventories, because they purport to reveal information about innate characteristics about an individual, can be instrumental in assessing and predicting job potential and success (Swanson & Watson). According to Eber (1976), personality characteristics may predispose an individual to function well in some occupational environments and badly in others. He states that

That domain of personality usually described as "vocational interests" is the most obvious example, but broader personality characteristics can be equally important. Highly extroverted people are not usually happy when working in isolation, and vice versa. A reasonable degree of matching between a person's temperament and habits and the demands of a job seemed a promising avenue for further exploration. (p. 103)

Initially personality assessment was done in a clinical context. However, the unreliability and lack of validity of expert judgment is often questionable (Eber, 1976). As a result, recent efforts have been made to objectify personality data. One problem of such efforts, however, has been to determine the meaning of the term "personality." According to Eber (1976), the term usually encompasses

Virtually all of the behavior patterns of a human being, including intelligence, habits, temperament, psychopathology, motivation, preferences, and interests. Such use of the term is certainly appropriate in some contexts, but it leads to classification of virtually any assessment techniques as "personality tests," including chemical tests of the content of the blood, tests of physiological functioning, measures of intelligence and aptitude, and virtually anything else. (p. 104)

To clarify the issue, Eber (1976) suggests that personality tests should focus on measurement of the normal range of

variation of habits, temperament, and ways of behaving while the primarily clinical devices such as the Minnesota Multiphasic Personality Inventory (Hathaway & McKinley, 1951) would be described as measures of psychopathology (despite the use of the word personality in test titles). (p. 105)

Following is a brief description of some of the more commonly used personality inventories:

The Minnesota Multiphasic Personality Inventory Test (Hathaway & McKinley, 1951)

The MMPI is designed to provide an assessment of major personality characteristics affecting personal and social adjustment. The primary purpose of the test is to identify personality traits indicative of psychopathology (Eber, 1976; Swanson & Watson, 1982).

The Sixteen Personality Factor Questionnaire
(Cattell, Eber, & Tatsuoka, 1970)

The 16 PF is composed of 181 forced-choice statements and provides a quick battery for individuals with limited educational and cultural experiences (Swanson & Watson, 1982). The test does not cover psychopathology, but is sensitive to some aspects of pathology such as maladjustment and anxiety (Eber, 1976). It may be administered to either groups or individuals, and a taped version is available for visually impaired or nonreading subjects.

The Eysenck Personality Inventory Test
(Eysenck & Eysenck, 1968).

The EPI is grounded in a two-factor theory of personality (extroversion and neurosis), and has been useful in demonstrating meaningful criterion associations (Eber, 1976). For example, it points out that receptionists are more extroverted than key punch operators, that psychiatric patients are more neurotic than normal individuals, etc.

As was the case with vocational interest inventories, these personality inventories have been used with and normed on normal populations. None have been used extensively with learning disabled individuals.

Conclusions

Personality and vocational interest inventories are useful in helping individuals determine potential occupations. The increasing complexity of the job market and the numerous varieties of available occupations often make occupational selection difficult. Personality and vocational interest inventories provide individuals with information to enable them to make better, more informed occupational choices. While personality and interests alone are not sufficient for success in a given career, a person with the personality, interests, and abilities suitable for a given occupation is more likely to do well and be satisfied in that occupation (Cronbach, 1960).

To prepare learning disabled students for occupations suited to their interests and personalities, interest and personality assessment should be considered an essential component of career/vocational assessment procedures.

Career Education for the Handicapped

If learning disabled students are to profit from career/vocational education programs, those who design them not only must understand traditional career/vocational education programs. They also need to be aware of and understand the historical development and philosophies of traditional career/vocational

education programs for handicapped students. Such knowledge will allow program designers to incorporate relevant elements of both approaches into a career/vocational education model uniquely suited for learning disabled students. Thus, the purpose of the following section is to describe the historical development, philosophies, and descriptions of traditional career/vocational education programs for handicapped students.

Historical Development

Traditionally, the focus of occupational programming for handicapped students has been on vocational education, and emphasis has been on the teaching of specific job skills. Career education, in terms of helping the handicapped individual obtain personal fulfillment through work, has been neglected. Consequently, the following discussion is concerned more with vocational, rather than career, education of handicapped students.

In 1978, the U. S. Office of Education took the position that an appropriate comprehensive vocational education should be made available to every handicapped student (Federal Register, Sept. 25, 1978). This statement was developed jointly by the Bureau of Education for the Handicapped (now Office of Special Education) and the Bureau of Occupational and Adult

Education. It emphasized that handicapped individuals encounter major barriers in obtaining employment and job-related training and are more frequently unemployed and underemployed than nonhandicapped individuals (Phelps & McCarty, 1984).

These concerns are justified in light of recent employment statistics pertaining to handicapped individuals. Levitan and Taggart (1977) noted that 40% of all handicapped adults are employed, compared to 74% of the nonhandicapped population. In his study of the employment patterns of mentally retarded persons, Hightower (1975) reported that only 21% are fully employed when they finish school, while 40% are underemployed and 26% are unemployed. In another discouraging report, Poplin (1981) noted that of the 30 million disabled persons in the United States, only 4.1 million are employed. Finally, Brolin and Elliott (1984) reviewed national income figures and determined that 7,800,000 handicapped adults have no income and 4,100,000 earn less than \$3,000 per year. Razeghi (1979) estimates that the cost of dependency among handicapped individuals exceeds \$115 billion per year.

In an attempt to combat the employment problems of handicapped individuals and lay the foundations for career education for handicapped students, the following legislation has been enacted: (a) Sections 503 and 504

of the Vocational Rehabilitation Act of 1973 provide for equity in both training and employment of handicapped individuals; (b) the Education Amendments of 1974 (PL93-380) provided federal funding for the purpose of promoting career education and specifically mentioned handicapped individuals as beneficiaries of these services; (c) the Education for all Handicapped Children Act of 1975 (PL 94-142) implies career education under the provision that children receive an appropriate education; (d) the Education Amendments of 1976 specify that federal monies be used to the maximum extent possible to assist handicapped students in regular vocational education programs; (e) in addition, the Career Education Incentive Act of 1977 and the Comprehensive Employment and Training Act (CETA) of 1978 provided federal funding to help handicapped individuals prepare for the world of work.

Passage of these laws has resulted in national efforts to improve secondary vocational programs for handicapped students, although Heller (1981) has referred to these efforts as minimal. Although almost ten years have lapsed since the passage of the most recent of the above-mentioned laws, their impact is yet to be felt. Brolin and Elliott (1984) assert that many of the 500,000 special education students who leave the educational system each year continue to do so "woefully

unprepared to acquire satisfactory societal roles in occupational, avocational, and daily living activities" (p. 12). Sitlington (1981) maintains that handicapped students who graduate from high school have acquired entry level skills at best, and Levinson (1984) reports that over one million students currently lack the career and vocational skills needed to compete for jobs in their communities.

Unfortunately, as Hoyt (1975) stated:
We have, for far too long, seemed to act as though a handicapped person should be both pleased with and grateful for any kind of work society provides. Unlike other persons, we seem to assume that, if a person is handicapped, boredom on a job is impossible....If any job in the world of paid employment can be found for the handicapped person, we seem far too often to be personally relieved and surprised when the handicapped person is anything less than eternally grateful.

Several possibilities exist to explain public school's failure to prepare adolescent handicapped students for work.

One contributing factor has been the tendency to institute secondary special education programs modeled after elementary counterparts. These programs focus on academic skills such as reading and arithmetic, and neglect career or vocational components (Cummings & Maddux, 1984; D'Alonzo, Marino, & Kauss, 1984; Heller, 1981). Hohenshil (1984) has commented:

In the past, the goals of most secondary special education programs were similar to those provided in the elementary schools. Many special educators seemed to believe that if their students didn't learn to read, write, and do arithmetic in the

elementary grades, then they should get another 6 to 8 years of the same. (p. 51)

Heller (1981) also discusses additional causes such as subject-matter orientation of secondary school teachers and emphasis on elementary practicum experiences for special education teachers-in-training.

Another contributing factor has been the lack of professionals specially trained to provide vocational and career education services to handicapped learners (Levinson, 1984). Educators trained in special education who traditionally have been responsible for educating handicapped students often lack knowledge and skills in vocational and career education (Cummings & Maddux, 1984; Levinson, 1984). Consequently, they have emphasized academic rather than vocational preparation of handicapped learners (Kokaska & Kolstoe, 1977). Vocational educators, on the other hand, while knowledgeable about career/vocational development and programming, know little about educating handicapped students (Cummings & Maddux, 1984; Levinson, 1984).

Another problem is related to the difficulty faced by many handicapped students who attempt to enroll in regular vocational education programs. According to Marino (1981), career education and vocational training usually provided in the secondary school for nondisabled students is also available but elusive for disabled students. This type of training and education is

ordinarily offered as an elective at the secondary level. Nondisabled students who register for these elective programs are usually accepted. However, handicapped students who register for these same programs are frequently screened out because they lack the prerequisites and background to qualify for the courses (D'Alonzo, et al., 1984).

The same problem exists in terms of career exploration and guidance for handicapped students. Hohenshil and Warden (1978) note that vocational educators express an urgent need for diagnostic services to identify, plan, and evaluate educational programs for handicapped students. However, school counselors are usually not trained to work with handicapped students and lack the diagnostic skills needed to develop appropriate programs for them. On the other hand, vocational rehabilitation counselors lack knowledge of public school vocational education programs and are unable to contribute to the vocational programming of the handicapped in the public schools (Levinson, 1984).

Heller (1981) places the blame on American secondary schools and concludes that "The fact is undeniable--secondary education remains a vast wasteland for the potential that handicapped individuals hold" (p. 583).

A final, major factor underlying all of these

difficulties may be that vocational-theory builders have developed their theoretical assumptions with normal, nonpathological populations, and have been little concerned with handicapped groups (Conte, 1983).

Whatever the reasons, the fact is that career education programs suited to the unique educational needs of handicapped learners have not yet been developed. More is needed both in terms of theoretical bases and educational programs. As previously mentioned, the only options usually available to handicapped students are special education programs and vocational education programs.

Special Education Vocational Programs

In the past, career education programs for handicapped learners have been delivered through special education work-study programs (Brolin & D'Alonzo, 1973; Sitlington, 1981). These programs were initiated in the 1950's and the 1960's because of the concern that academically oriented curricula were not meeting the vocational and social needs of handicapped students leaving the school system (Brolin & D'Alonzo, 1973). Research on community adjustment of mildly mentally retarded students revealed that a majority had major difficulties after leaving public school (Brolin, 1972; Brolin, Duran, Kromer, & Muller, 1975; Tobias, 1970). However, a number of other studies (Brolin, et al.,

1975; Chaffin, Davison, Regan, & Spellman, 1971; Kidd, Cross, & Higginbotham, 1967; Kokaska, 1968; Strickland & Arrell, 1967) reported that handicapped students provided with occupationally-oriented programs showed marked improvement in vocational and community adjustment.

The emphasis of these programs has traditionally focused on development of work attitudes and general work behaviors, rather than on specific skill training. From the beginning, these programs have been designed primarily for mentally retarded adolescents. Little has been done for other handicapped groups, particularly learning disabled and behavior disordered students (Sitlington, 1981).

The basic purpose of these programs has been to coordinate classroom activities with on-the-job experiences. According to Sitlington (1981), work-study programs closely resemble the cooperative education model employed by regular vocational education, although the classroom experience emphasizes general work habits and attitudes rather than specific instruction in occupational areas. The work-study model is used almost exclusively in self-contained classroom settings.

Thompson and Wimmer (1976) have identified five primary components of the work experience sequence: (a) prevocational experience, (b) job analysis, (c)

in-school work experiences, (d) community placement, (e) after graduation placement and followup.

Regular Vocational Education

The inclusion of handicapped students in regular vocational education programs is mandated by three major pieces of legislation (Sitlington, 1981): (a) The Rehabilitation Act of 1973, Section 504; (b) The Education for All Handicapped Children Act of 1975 (PL 94-142); and (c) The Education Amendments of 1976, Title II (PL 94-482).

As with career education, a number of definitions of vocational education exist (Sitlington, 1981). The Education Amendments of 1976 use the following definition:

Vocational education means organized educational programs which are directly related to the preparations of individuals for paid or unpaid employment or for additional preparation for a career requiring other than a baccalaureate or advanced degree...(p. 53865).

According to Sitlington (1981), vocational education has much to offer handicapped students in specific skill training for semiskilled and skilled occupations.

Unfortunately, even though legal mandates exist for the inclusion of handicapped students in regular vocational programs, this is rarely occurring. Although handicapped individuals constitute 10 to 12% of the

general population, they account for only 2.56% of the total enrollment in vocational education programs, with one-third of these students receiving their training in segregated vocational programs for the handicapped (Office of Civil Rights, 1979). Apprenticeship programs had the lowest percentage of handicapped students enrollments (0.37%) with work-study programs having the highest percentage (4.48%). This data led to the Office of Civil Rights' (1980) conclusion that handicapped students are clustered in vocational education programs that prepare them for lower-level occupations. Other career preparation programs also show underrepresentation of handicapped participants: 3% of total CETA clients; 3% of community college enrollments; and 2% of enrollments in four-year colleges (Cegelka, 1985).

According to Cegelka (1985), a number of factors contribute to handicapped underrepresentation in vocational education programs. These include: (a) high dropout rates of handicapped secondary students that may be as much as five to six times higher than those for nonhandicapped students (President's Committee on Employment of the Handicapped, 1979); (b) the focus on mainstreaming handicapped students in the regular curriculum; (c) secondary special education teachers who have "little realistic understanding of the realities of

the world of work and who have their strongest preparation in elementary level methodologies and curriculum" (p. 605); and (d) the resistance of vocational education teachers to include handicapped students in their programs. This resistance exists because of the view that including handicapped students would lower the status of vocational programs and jeopardize their existence since these programs are evaluated on the basis of job layoffs of former participants

Conclusion

Career education and vocational training are necessary if handicapped individuals are to become independent of parents and community social and welfare agencies. According to D'Alonzo, et al. (1984):

Career education and vocational training hold the key to unlocking the "ports of entry" into the world of work for the disabled student. Educators, industrialists, and manufacturers, as well as political agencies, are well aware of the potential manpower and human resources of the disabled available in all communities. They know that, if properly trained through career and vocational education, disabled persons can be assets and valuable employees. (pp. 24-25)

Even though legislation has mandated that handicapped students be included in public school career/vocational programs, such participation is rare. According to Cegelka (1985), it is impossible to

legislate "emotions, attitudes, or a sense of commitment" (p. 606). She emphasizes the need to allay the fears and concerns of vocational educators by assuring them that inclusion of handicapped students will not displace nonhandicapped students in vocational programs. She also stresses that:

The focus of vocational education must be broadened to provide greater emphasis on the development of general work skills and attitudes. In-service education must provide vocational education teachers with the needed instructional skills for working with students with disabilities, and program entrance requirements must be changed to reflect the competencies needed to perform the jobs targeted on the IEPs rather than the aptitudes required to complete an entire training program. Finally, program evaluation should be broadened to include the provision of services to special needs students and not limited to labor market layoffs (p. 606)

Vocational Assessment of the Handicapped

The success of career/vocational education programs for learning disabled students depends on the appropriateness of such programs for each student enrolled. One way to ensure that students are placed in programs suited to their individual needs is to include a well-designed career/vocational assessment component. Assessment should measure more than just work skills and aptitudes. Student personalities and interests should also be considered before they are placed into any vocational programs.

Sitlington (1979) emphasizes that although

secondary and postsecondary vocational programs for handicapped students have existed for many years,

The majority of these programs seldom contain any provision for systematically obtaining vocational assessment data on the student and if there is an assessment component, it is usually a one- to two-week segment in the student's three- or four-year program. (p. 1)

Sitlington further states that this assessment usually consists of only paper-and-pencil and manual dexterity tests.

In their review of career/vocational assessment procedures, Stodden and Ianacone (1981) also maintain that the purpose of vocational evaluation has traditionally been to determine vocational aptitude and predict adjustment in particular work settings. They state that assessment of career interests, values, and work personality in special student populations has lagged behind other approaches to work evaluation.

Stodden, Ianacone, and Lazar (1979) state that interest/personality assessment with handicapped individuals is rare (a) because professionals often do not perceive handicapped individuals as serious participants in the competitive world of work; (b) because of a prevailing attitude that handicapped individuals are not capable of making valid career choices; and (c) because of a failure to consider

reading levels and career cluster choices in the development of such instruments. In regard to the last of these problems, Kapes and Parrish (1983) maintain that:

It is imperative for assessment to be sensitive to a student's disability so that the handicap does not bias his or her performance. Some instruments can be used with no modification, but others may require adjustments, such as special answer sheets, longer time periods, or interpreters. Finally, some tests and inventories may not be useful at all with certain populations....In situations like these, assessment tools must be sensitive to the special needs of the individual student to assure that what is measured is valid, fair, and appropriate for the individual. (p. 50)

One valid use of career/vocational assessment of handicapped students is to determine which program option is best suited for individual handicapped students. Sitlington (1979) emphasizes that the purpose of vocational assessment is to gather the maximum amount of data on the handicapped individual to determine the best match between that individual and his or her program or job placement. According to Sitlington (1979), this match is crucial if handicapped students are to receive the full advantage of existing vocational programs since these students may not have the flexibility to compensate for and adjust to programs or jobs for which they are not qualified.

Public Laws 94-142 and 94-482 require that an Individualized Education Plan (IEP) be written for every

student receiving special education services. These laws specify that every handicapped student is to receive an appropriate education in the least restrictive educational environment. For many students, the most appropriate education includes a vocational component. According to Sitlington (1979), "for relevant and appropriate objectives to be written in the vocational area, a much more complete assessment picture must be obtained on the individual than is currently the case" (p. 2).

According to Brolin and Brolin (1979), the vocational segment of the IEP should answer several questions including "What are the student's vocational interests and does he have any realistic choices at this time?" (p. 142).

Cegelka (1979) suggests that career/vocational assessment should be included along with academic assessment as one of the basic components of the IEP. She states that "the academic assessment, in combination with data from appropriate vocational interest and aptitude assessments, can suggest a general direction for the career preparation components of an individual student's program" (p. 172).

Conclusion

Without an effective career/vocational assessment component, career/vocational education for learning

disabled students is likely to be as inappropriate as academic programs are. According to Stodden and Ianacone (1981), the purposes for vocational assessment should be (a) to produce information that can be used to assist special education students and professionals who work with them in the career development process; (b) to provide information about the handicapped individual, the world of work, and specific work related skills; and (c) to determine how general and specific occupational information can be used to maximize the handicapped individual's options for successful employment.

In short, the purpose of career/vocational assessment should be to ensure the best possible match between the learning disabled individual and his or her future work environment.

Occupational Interests and Intellectually Handicapped Populations

One reason that many learning disabled individuals are not doing well vocationally may be that they are occupationally stereotyped in a way that is incongruent with their vocational personalities (Heller, 1981). Studies examining job stability and success frequently indicate that vocational satisfaction, stability, and achievement depend on compatibility between an individual's personality and the environment in which that individual works (DeVoge, 1975; Gottfredson, 1977;

Mount & Muchinsky, 1978; Wiggins, 1976). Unfortunately, many learning disabled persons are trained for and working in jobs that are not suited to their personalities and interests (Sitlington, 1981).

While nonhandicapped individuals have traditionally been considered as having a variety of occupational interests (Campbell & Hansen, 1981; Holland, 1985; Kuder & Diamond, 1979), the same has not been true for handicapped persons (Timmerman & Doctor, 1974). If learning disabled individuals have as much variety of occupational interests as nonhandicapped persons, then developers of career/vocational programs for this population should consider those interests in terms of training and counseling approaches. One way to determine personality and occupational interests is by administering occupational interest inventories.

In comparison to vocational assessment in general, little has been written addressing the assessment of occupational interests of intellectually handicapped populations. Most of the work that has been done in this area has been with mentally retarded individuals. However, some findings may be generalized to learning disabled populations. Even with mentally retarded populations, assessment of occupational interests has lagged behind more traditional types of vocational evaluation (Timmerman & Doctor, 1974).

Timmerman and Doctor (1974) suggest that occupational interests in retarded individuals may be ignored because (a) most mentally retarded persons have not seriously been considered for competitive employment; (b) of the general attitude that mentally retarded individuals do not have the ability or social maturity to make valid occupational choices; and (c) of a lack of appropriate instrumentation in terms of reading levels and career cluster choices.

Stodden, Ianacone, and Lazar (1979) state that such commonly used interest inventories as the Strong Vocational Interest Blank (SVIB) and the Kuder Occupational Interest Survey have proven to be unsatisfactory for use with mentally handicapped populations since high verbal ability and a wide range of experience are necessary to accurately respond to test items.

Another reason that occupational interest inventories are often invalid when used with mentally retarded populations may be that these individuals lack realistic vocational goals (Stodden et al., 1979). Kuhn (1966) reported that, when compared to nonhandicapped controls, mildly retarded junior high school students had significantly lower levels of understanding of their selected future occupations.

In other studies investigating ability of mentally

handicapped subjects to make realistic vocational choices, Sears (1940) and Ringness (1961) reported that retarded children frequently exhibit unrealistically high or low self-appraisal that tends to reflect in high or low expectations of occupational choice. Knight (1972) found black male mentally retarded subjects to be more realistic than white males in vocational aspirations.

Conclusions

In spite of their weaknesses, instruments that assess occupational interests are critical components of career/vocational assessment of handicapped individuals. However, Stodden et al. (1979) point out several cautions in using vocational interest assessments with mentally handicapped adolescents:

1. Many of the instruments and/or techniques used in assessing vocational interests have been criticized because they (a) frequently present limited forced choice career areas that may or may not be appropriate for mentally retarded persons; (b) often have strong occupational, sex, race, and regional biases that discriminate against the choices of many mentally handicapped adolescents; (c) have inappropriate reading levels, instrument length, and lack necessary motivation and awareness activities as prerequisites to assessment; (d) are lacking in research as to stability of

occupational interests of mentally handicapped subjects.

2. Without proper attitudes and philosophies of individuals responsible for administration of assessment activities, the use of information acquired from assessment may be meaningless or even harmful for the assessed individuals.

3. Validity of occupational interest inventories used with mentally handicapped individuals is determined by the context and purposes for the use of such instruments. The authors explain their position with the following statement:

Occupational assessment must be conceptualized as a vehicle to produce demonstratively useful information for the client's exploration and growth, rather than a set of data from which to predict chances of occupational success. When occupational interest evaluation is viewed as part of a sequence of growth activities in career exploration, experimentation, and discovery, the concept of evaluation becomes a non-threatening series of activities with emphasis upon client change and growth. (p. 297)

Olshansky (1969) also emphasizes the importance of proper professional attitudes and philosophies in administration and interpretation of assessment information. He states these improper attitudes and philosophies often arise because of certain misconceptions including: (a) that we have knowledge pertaining to level of intelligence required for different types of jobs; (b) that a slow learner is a

poor learner; (c) that intelligence is a constant and global quality; (d) that mentally handicapped individuals can tolerate boring tasks; and (e) that all mentally handicapped persons have the same interests and personality characteristics. Olshansky points out that since many of these misconceptions continue to exist among professionals, practitioners, and employees working with mentally handicapped persons, accomplishing meaningful occupational interests assessment is frequently quite difficult.

In conclusion, occupational interest measures have both strengths and weaknesses in terms of their appropriateness for use with mentally handicapped subjects. However, when included as part of a client-centered series of developmental growth and awareness activities, occupational interest evaluation becomes one of several variables necessary in appropriate career/vocational programming for mentally handicapped youth (Stodden et al., 1979). Only through such programming is the assurance of a high degree of work satisfaction and success possible. According to Stodden et al. (1979), education and rehabilitation personnel should become more involved with occupational interest evaluation as they work to meet the career/vocational needs of mentally handicapped individuals.

Career Development Theory and the Handicapped

One reason that learning disabled students are frequently denied appropriate career/vocational programming may be that vocational-career theory builders have verified their theoretical assumptions only with normal, nonpathological populations, and have been little concerned with handicapped groups (Conte, 1983). Consequently, researchers often hesitate to apply existing theoretical models to handicapped populations. However, although the lack of research conducted with handicapped groups makes the assumption tentative, it appears that "In most respects, career development of the handicapped is not different from career development for people in general" (Kapes & Parrish, 1983, p. 50). Conte (1983) agrees, and makes the following statement:

What is called for is not a separate theory of vocational development for disabled persons, but rather a reexamination of current theories in light of the observation that these theories may not in fact fit the data of exceptional or minority groups, of which the case of disabled persons is only one. Thus, renewed efforts to integrate thinking about disabled persons and vocational development are clearly needed, and a greater understanding of the differences in life experiences encountered by many disabled persons is necessary if vocational practitioners are to be successful in helping persons who are disabled to fulfill their vocational aspirations. (p. 327)

Unfortunately, not everyone agrees that traditional career/vocational development theories should be applied to handicapped groups. Career/vocational development research and theory has typically omitted discussion of

the unique needs of disabled persons. In their review of vocational guidance research, Holcomb and Anderson (1977) point out that less than 6 percent of articles appearing in major professional journals during the period from 1971 to 1975 address the concerns of special populations.

Conte (1983) gives several reasons for failure to apply vocational development theories to disabled individuals:

1. Writers and researchers may consider disabled people as being subject to the same developmental forces and experiences as nondisabled persons; thus they need no special consideration or theory.

2. Writers and researchers may assume that life experiences of disabled individuals or the nature of the disability make disabled populations so different from the rest of society that theories of vocational development cannot and should not be applied to them.

3. Vocational development theorists may consider their work too recent or theoretical to apply to vocational development issues of disabled populations.

4. Writers and researchers may be unfamiliar with the lives and experiences of disabled populations.

Conte (1983) also makes the point that while some attempts have been made to apply career/vocational theories to handicapped groups, these ordinarily suffer

from some inherent weaknesses including the following:

1. Much of the theoretical writing on vocational development and disabled persons focuses on models of work adjustment rather than on patterns of vocational development or the relationship between various jobs held by an individual throughout his or her lifetime.

2. Much of the theory that has been developed with handicapped persons focuses on traumatically disabled individuals rather than on congenitally disabled persons. One consequence of such an emphasis is a "strong tendency for the literature to be dominated by discussions of psychological variables affecting career behavior, often to the exclusion of variables external to but nonetheless influential on the individual" (Conte, 1983, p. 317).

3. There seems to be a considerable degree of conceptual overlap and ambiguity between theories of career development, career choice, and work adjustment.

Conclusions

Currently, there is a lack of adequate career/vocational theory to explain and predict vocational behavior of handicapped populations. This may be one reason that career/vocational public school programs have not been appropriate for learning disabled students. Thus far, attempts to develop such theories

have been made with physically handicapped and mentally retarded populations, groups who traditionally have received vocational preparation and training. Yet even these theories are considered inappropriate and ill-conceived.

Therefore, it is not likely that attempts will be made to develop career/vocational theories applicable for learning disabled students as long as the teaching of academics continues to take priority in their educational program. Consequently, if appropriate career/vocational programs are to be developed for this groups, such programs will likely have to use existing theories as their base.

The Holland Theory of Vocational Personalities and Work Environments

Because of the lack of appropriate assessment instruments and because of the failure to include handicapped populations in the development of vocational/career theory, a stereotypic view of handicapped individuals, including those with learning disabilities has emerged. This stereotype portrays affected individuals as capable of only the most menial, boring, and low-level jobs (Cummings & Maddux, in press). Thus, there is the possibility that training programs may be influenced by this stereotype. Sitlington (1981) has stated that most special education

students who graduate from high school acquire entry level skills at best. Heller (1981) agrees and comments that "Handicapped students have too often been pigeonholed into somewhat arbitrary job classifications and trained accordingly" (p. 582).

If Kapes and Parrish are correct when they state that "In most respects, career development of the handicapped is not different from career development for people in general" (Kapes & Parrish, 1983, p. 50), then it is likely that pigeonholing handicapped individuals into a restricted group of certain types of jobs is not beneficial to the handicapped individual or to society.

One way to avoid stereotyping handicapped students is to include a comprehensive and appropriate assessment component into career/vocational development programs. Stodden and Ianacone (1981) suggest that for handicapped children "Career/vocational assessment activities should be an integral part of a student's education and training program, starting in preschool and continuing through adulthood" (p. 600).

Other authorities attest to the importance of career/vocational assessment if programs for the handicapped are to be successful (Brolin, 1982; Hohenshil, 1984; Sitlington, 1981; Phelps & McCarty, 1984). Unfortunately, however, it is difficult to find any theoretical orientation that has led to development of assessment instruments of value when used with

handicapped populations.

One theorist whose work has generated a great deal of discussion and research (Conte, 1983; Osipow, 1983) is John Holland (1985). Although Holland has not been primarily interested in handicapped individuals, his theory appears to provide a basis for formulating ways to look at handicapped individuals in a nonstereotypic manner. In the past, we have considered this population to be capable of low-level, menial work only. We have failed to consider the possibility that they may have personalities and interests as varied and unique as those of the general population.

The Holland Theory

Holland (1985) proposes that an individual's career choice reflects to some extent that person's personality and behavioral styles. He further hypothesizes six personality types and six environments: Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C).

The Six Types

Individuals' predominant personality types are determined after their vocational interests are assessed and a three-letter occupational code is obtained. The three-letter code corresponds with the six personality types. For example, if an individual obtains a

three-letter occupational code of RIS, then that individual is considered to be Realistic with Investigative and Social characteristics. According to Holland (1979), "By indicating the three types a person resembles most, the three-letter summary code allows for complexity of personality and reduces some of the problems inherent in categorizing a person as a single type" (p. 3).

Instruments developed by Holland to assess occupational interests include the Vocational Preference Inventory (VPI) (Holland, 1977), the Self-Directed Search (SDS) (Holland, 1979), or the Self-Directed Search Form E (SDS-E) (Holland, 1979). According to Holland (1985), vocational interests are an expression of personality. He therefore believes that interest inventories are personality inventories (Holland, 1985).

Holland illustrates the relationships among the six types with a hexagon. Each type is depicted at one of the corners of the hexagon as shown in Figure 1.

The hexagon first occurred to Holland when he noticed the shape of the intercorrelation matrix of scores on the Vocational Preference Inventory. Distances between points are inversely proportional to the size of the correlations between them (Holland, 1979). A wealth of research has been done testing the appropriateness of

Figure 1--Holland's Hexagon

the hexagon, and support has usually been found (Prediger, 1982).

According to the theory, there are also six environments in our culture identical to the personality types listed above. Individuals in occupational environments that fit their personality types are more likely to be satisfied with their jobs, better employees, and less likely to change jobs than those who are in environments that do not fit their personality types. Implications for vocational counseling following assessment and classification of personality type are obvious. Before proceeding, a description of each of the six types is in order.

The Realistic personality is characterized by aggressive, antisocial, and masculine behaviors. Emphasis is on physical, highly concrete activities with avoidance of abstract problem situations. A Realistic environment would be one in which much physical strength is required such as working with heavy machinery, outdoors, or as a mechanic.

Like the Realistic individual, the Investigative person avoids close interpersonal contact. However, unlike the Realistic type, the Investigative person enjoys abstract problem-solving and organizing and understanding rather than dominating and persuading (Osipow, 1983). The Investigative environment requires

abstract problem-solving skills and a scientific curiosity. Biologists and mathematicians fit well into the Investigative environment.

The Artistic personality is similar to the Investigative in terms of dealing with abstractions and being asocial except to use people as an audience for creative performances. Unlike the Investigative type, however, the Artistic individual is more feminine than masculine, shows relatively little self-control, and expresses emotion more readily than most people (Osipow, 1983). The Artistic type also dislikes structure, has difficulty with authoritative types, and is generally rebellious. Artistic environments would include the theatre, dance companies, and art studios.

Individuals with a Social orientation prefer close interpersonal situations, enjoy helping others, and are skilled in interpersonal relations. They avoid situations requiring intellectual problem solving or a great amount of physical skill. Social occupations include teaching, counseling, and social work.

Enterprising personalities have interpersonal skills equal to those of Social types. However, instead of using their skills to help and support other people, these individuals use them to manipulate and dominate. They desire wealth, power, and status. These goals are met by using other people. Enterprising environments

include sales occupations, corporations, and politics.

Finally, Conventional types exhibit concern for rules and regulations, practice self-control, and have a desire for order, both of things and people. They often subordinate their personal needs and have a strong respect for individuals who have power and status. These types do well in structured occupations such as accounting, clerical work, and school administration.

Unfortunately, handicapped individuals are often advised by school counselors, psychologists, teachers, and others to pursue careers which generally fall only into the Realistic category, without regard to personality type of the individual concerned (Heller, 1981). Jobs such as auto mechanics, low-level food handling, janitorial service, and plant nursery helpers are examples. Plue (1984) analyzed jobs held by 3,177 mildly retarded individuals over a six-year period and reported that the jobs generally required unskilled or semi-skilled work involving sorting, motor speed, manipulation of parts, separating, matching, assembly, and tool use.

Congruence, Consistency, and Differentiation

Three concepts relative to the Holland types need to be discussed at this point and may help account for the high rates of unemployment among handicapped adults (Brolin, 1982). These concepts are (a) congruence, (b)

consistency, and (c) differentiation.

Congruence may best be defined as the match between the personality type and the occupational environment. For example, an individual with a Realistic personality should be happiest in a realistic occupation such as auto mechanic or engineer, depending upon the individual's needs and abilities. The incongruent individual is more likely to be dissatisfied, unhappy, and unsuccessful in his or her occupation.

The term consistency applies to the interrelationship of the personality types within the individual. We can understand consistency if we examine Holland's hexagon. Consistency occurs when the predominant types within the individual are close to each other on the hexagon. For example, the Investigative-Artistic person is more consistent than the Artistic-Conventional person. The consistent individual finds it easier to evaluate his or her own personality in terms of making appropriate career choices. The inconsistent individual is likely to encounter difficulty in selecting an occupational environment and may often change from one occupation to another.

Finally, differentiation may be defined as how strongly the predominant Holland type is predominant within the individual. Actually, every individual is a

mixture of all of the Holland types. However, some types are more predominant than others. In assessing individuals, Holland recommends listing the three types with the highest score. For instance, a listing of IAS would indicate that the individual scored highest on Investigative items, followed by Artistic and Social items. A highly differentiated personality, however, may exhibit only one personality type almost to the exclusion of all the others. The more highly differentiated an individual is, the easier it is for that person to evaluate his personality and job interests. In contrast, the undifferentiated personality, because he or she has many skills and interests, finds self-evaluation more difficult. However, should the undifferentiated person find an occupational niche, he or she may be happier than the differentiated personality. Because this individual has so many different skills, he or she finds it easier to develop interests outside the work environment.

The Effects of Self-evaluations and Early Experiences

Some other interesting components of Holland's theory include the concept of effective self-evaluation and the influence of early experiences (Osipow, 1983). These concepts are especially interesting as they might apply to individuals who are vocationally nonfunctional.

According to Holland, appropriate self-evaluation is dependent on several variables including intelligence, social status, economic condition, educational level, and health. If these variables exert a negative influence upon the individual, the result may be a "flat" profile of types. Should this occur, the individual will encounter difficulty in selecting an occupational environment, and he or she may constantly change from one environment to another.

In addition, Holland states that vocational self-evaluation is dependent upon the adequacy of self-knowledge and occupational knowledge. The more information the individual has about each of these, the more effective and appropriate is his or her occupational choice.

Holland also hypothesizes that social pressures in childhood and early adolescence and experiences with parents probably have a significant effect on determining the personality type.

Selected Research Findings

According to Osipow (1983), Holland's research has been comprehensive within his theoretical framework, it has frequently been longitudinal, and it has attempted to assess a variety of personal, family, social, and achievement correlates pertinent to his theoretical construction. Instruments developed in conjunction with

Holland's theory and used by Holland and others to test the theory have been meticulously devised and widely researched. These instruments were mentioned previously.

Holland's investigations tend to support the internal consistency of the types as they predict a wide range of behavior in different contexts (Holland, 1966). He also found that the types may be represented by a crude hexagon (Holland, 1966); that most people maintain stable work histories (Holland, 1985); that an individual's first career choice reflects his or her predominant personality type (Holland, 1959); that original career choices are better predictors of college major than VPI scores (Holland, 1966).

Other researchers have found that a relationship exists between intelligence and self-evaluation and level of occupational choices (Stockin, 1964); that Realistic, Investigative, and Enterprising students hold more accurate occupational stereotypes than Social, Conventional, and Artistic students (Banducci, 1970); that there is considerable construct validity among the Holland types, personality scores, and occupational preferences (Wall, Osipow, & Ashby, 1967); that people generally work in environments congruent with their type (Mount & Muchinsky, 1978); that congruence leads to better personal adjustment (Walsh & Russel, 1969); and that the environment impacts on vocational preference

and persistence (Walsh & Lacey, 1969).

Implications for Learning Disabled Individuals

Although research is extensive, and Holland's theory appears to be sound in its application to normal populations, there has been little investigation of the theory related to handicapped populations. To date, no application has been made to learning disabled groups although Winer, Wilson, and Pierce (1983) investigated use of the SDS-E with high school remedial reading students.

In regard to the Holland orientations, it would be useful to determine which personality types might be more representative of individuals with learning disabilities. For example, might learning disabled individuals more frequently fall into the Realistic category or might there be diversity all around the hexagon?

Another relevant question is whether or not it is possible to assess the interests of learning disabled individuals and use the results to help them achieve congruence instead of simply slotting them into boring, low-level, Realistic jobs. Holland has published the Self-Directed Search Form E. This instrument uses simplified vocabulary and procedures and is intended for use with students with reading problems. However, no

research has been conducted to establish reliability and validity with handicapped populations.

Another point made by Holland is that the adequacy of the vocational decision and the amount of difficulty encountered in the process of making the decision are related to knowledge about self and the world of work. Unfortunately, many learning disabled individuals have very limited awareness both of themselves and their handicap and of available career opportunities (Cox, 1977; Fafard & Haubrich, 1981). If educators and vocational counselors explained to learning disabled individuals the nature of their handicaps, what their strengths and limitations were, and what jobs might be available to make use of the strengths, would more of them experience job satisfaction?

Conclusions

To conclude, Holland's theory has stood the scrutiny of research and appears to be one viable explanation of vocational choice and career patterns. Investigators continue to apply the theory to a variety of populations. The possibility exists that application of Holland's theory to learning disabled populations could be useful in terms of understanding their occupational characteristics and helping them attain job satisfaction and personal achievement. Such an effort might be rewarding for both learning disabled

individuals and the society in which they live and work.

Summary Statement

The review of the literature suggests that learning disabled adolescents and adults are not making adequate postsecondary work adjustment. The primary cause for this failure may be lack of appropriate public school career/vocational education programming for learning disabled students. Currently, learning disabled secondary students have three options: (a) the regular secondary academic program, (b) the regular career/vocational education program, and (c) the career/vocational education program designed for more severely handicapped students. However, none of these programs may be suited to the unique learning needs of learning disabled students. What is needed are career/vocational education programs designed specifically for learning disabled students.

Presently, no theoretical base exists on which to develop career/vocational education programs for learning disabled students. There are several reasons for this. The first stems from the lack of an agreed-upon operational definition of learning disabilities.

Second, secondary programming for learning disabled students has been based on the elementary model of academic remediation. Only recently has it become

obvious that this model is not appropriate for most secondary learning disabled students and that more is needed in terms of career/vocational education.

Finally, there is no theoretical base on which to develop career/vocational education programs for any handicapped group, much less learning disabled students. Even though vocational programming for more severely handicapped students has been in place in the public schools for some time, such programming is not built upon any theoretical model. Since learning disabilities has only recently been recognized as a legitimate handicapping condition, it is understandable that theoretical models have not yet been developed for this group.

In conclusion, it seems appropriate to consider the career/vocational needs of learning disabled secondary students. Presently, learning disabled students are being trained for and placed in menial, low-level jobs based on a stereotypic view of their interests and/or personalities. A first step in developing appropriate career/vocational educational programs for this group should be to investigate whether or not such a stereotypic view is based on fact.

CHAPTER III

METHODOLOGY

The purpose of this study was to investigate whether learning disabled high school students have vocational interests and personalities as varied as those of nonlearning disabled high school students. John Holland's Self-Directed Search (SDS) and Self-Directed Search Form Easy (SDS-E) were the instruments used to measure vocational interests and personalities as falling into one of six categories or Holland personality types.

The study also considered whether the SDS Form Easy (SDS-E) is more appropriate than the SDS for use with learning disabled students. The following research hypotheses were tested: (a) the frequency of students falling into each of the six Holland types will be independent of the presence or absence of disability; (b) coefficients of equivalence between each of the Holland type scores on the SDS and the SDS-E for learning disabled students will be significantly lower than the coefficients of equivalence for scores on the SDS and SDS-E for nonlearning disabled students; (c) the proportion of learning disabled students making errors on the SDS only will be significantly higher than the

proportion of learning disabled students making errors on the SDS-E only. This chapter will discuss the methods used in testing these hypotheses.

Subjects

In order to compare the diversity of vocational interests and personalities among learning disabled and nonlearning disabled high school students, 96 learning disabled high school students were matched with 96 nonlearning disabled high school students. Matching was necessary because random assignment was impossible. All subjects attended grades nine through twelve in the five high schools in a large West Texas city. The group identified as nonlearning disabled had never received any form of special education services. The total sample included 140 males and 52 females from three ethnic groups including 118 Anglos, 50 Blacks, and 24 Hispanics. The mean age of the total sample was 16.4 years.

The two groups of subjects were matched on the basis of sex, ethnicity, and socioeconomic status (SES) to control for possible effects of these contingency factors on outcomes of the study. Holland (1985) suggests that a person's dominant interest type is shaped in part by his or her life-history experiences including sex and socioeconomic status. Several other studies suggest that race and socioeconomic status have

an effect on SDS results (Gottfredson, 1978; Slaney, 1980b; Slaney & Brown, 1983).

Sampling Procedure

Learning Disabled Students (LD)

Since Texas identifies as learning disabled any student whose achievement is significantly lower than aptitude, many students are receiving special education services who may be underachieving for reasons other than that they are handicapped. Therefore, for the purposes of this study, the federal definition of learning disabilities was used as the criterion for identifying learning disabled students. The federal definition makes use of the following three basic criteria, all of which should be satisfied before a diagnosis of learning disabilities can be made: (a) the discrepancy criterion, (b) the process deficit criterion, and (c) the exclusion criterion.

The folders of all 190 high school students identified by the school district as learning disabled were submitted to a panel of three experts in order to eliminate students not meeting the federal definition of learning disability. Included on the panel was a public school learning disabilities teacher with 10 years' experience teaching learning disabled high school students, and two university instructors of special

education. If two of the three persons on the panel agreed that an individual met the federal definition of learning disabilities, that person was included in the study. White, Deshler, Schumaker, Warner, Alley, and Clark (1983) used a similar procedure to determine if learning disabled students met the federal definition of learning disabilities.

In making their choices, the panel considered each student's achievement test scores, IQ subscale scores, examiner's comments, and teacher opinion and comments. A total of 103 students were chosen by the panel as meeting the criteria. Seven students dropped out of the study before the conclusion due to absence, moving out of town, etc., leaving a final sample of 96 learning disabled subjects including 70 males and 26 females.

During the first administration of the SDS/SDS-E, learning disabled students were asked to fill out a data sheet (see Appendix A) which asked for information pertaining to sex, age, ethnicity, and major breadwinner's occupation. Included in the final learning disabled group were 59 Anglos, 25 Blacks, and 12 Hispanics. The mean age was 16.6 years. The numbers of LD students in each of the seven respective socio-economic categories from one to seven were 4, 13, 15, 23, 20, 13, and 8 (1 is the highest SES category and 7 is the lowest). The median SES was 4.20.

Matching Procedure

After learning disabled subjects were selected, all students in study halls of the five high schools were given a data sheet to fill out. The sheets were identical to those filled out by learning disabled subjects. Information from these sheets was then used to match NLD students with LD students. Matching was done on sex, SES, and ethnicity.

Data sheets were first examined for each member of the LD group and coded for sex, ethnicity, and SES. Then NLD data sheets were examined for matches. Exact matches were made for sex and ethnicity with all subjects. When matching for SES, 70% of matches were exact (1 with 1, 2 with 2, etc.), 23% of matches were within one point of each other, and 7% were within two points of one another. Whenever possible, two NLD students were matched with one LD student to eliminate effects of NLD mortality.

Nonlearning Disabled Students (NLD)

Obviously, the number of nonlearning disabled males and females, and Anglos, Blacks, and Hispanics were identical to that in the LD sample. Included in the final nonlearning disabled group were 70 males and 26 females. There were 59 Anglos, 25 Blacks, and 12 Hispanics. The mean age was 16.3 years. The numbers of NLD students in each of the seven respective

socio-economic categories were 7, 15, 18, 24, 14, 13, and 5. The median SES was 3.83

Instruments

Three instruments were used in the study: the Revised Occupation Rating Scale (Warner et al., 1949), the Self-Directed Search (SDS) (Holland, 1977), and the Self-Directed Search Form Easy (SDS-E) (Holland, 1979).

The Revised Occupation Rating Scale

The Revised Occupation Rating Scale was used to determine SES of each subject. The instrument places families in one of seven social classes (1 is the highest class, 7 the lowest) based on occupation of the major breadwinner. The instrument is very commonly used and is acknowledged to have acceptable reliability and validity. Warner et al. (1949) reported a correlation of .91 has been found between results of the scale and the evaluative participative method of determining social-class position. Miller (1977) discussed five common scales for researchers and advised use of the scale if a short scale is desired. Robinson, Athanasiou, and Head (1969) have called the scale the most sophisticated short classification scale available.

The Self-Directed Search (SDS)

The SDS is a self-administered, self-scored, and

self-interpreted vocational personality assessment instrument. The SDS is based on Holland's theory of vocational choice and his occupational classification system. Two editions of the SDS have been published, the 1970 edition and the 1977 edition. According to Holland (1979), the 1977 edition closely resembles the 1970 edition. The SDS has five sections (228 items) used to assess an individual's similarity to the six Holland types.

The SDS is designed so that the individual taking the test must check "Like" or "Dislike" or "Yes" or "No" to a series of statements in each of three sections: Activities, Competencies, and Occupations. There are six groups of statements in each of the three sections, each group corresponding with the six Holland codes of R, I, A, S, E, or C. As the individual progresses through the test, "Like" or "Yes" responses in each of the six groups are totaled.

After completing the third section, directions for a fourth section, Self-Estimates, instruct the individual to rank him- or herself from low to high on each of six traits corresponding to each of the six Holland types.

After completing the test, the individual totals all positive responses under each of the six categories corresponding to the six Holland types arriving at a

total R score, a total I score, and so on. Scores in each of the six categories may range from 0 to 50. The categories with the three highest scores are then translated into the individual's summary code. For example, if the individual's three highest scores were in the R, I, and A categories, that individual's summary code would be RIA. The first letter represents the individual's predominate Holland type, with the second and third letters representing secondary and tertiary interests.

After obtaining the summary code, the individual then refers to a supplementary booklet, the Occupations Finder. The Occupations Finder includes occupations held by most of the people in the United States. These occupations are arranged under common SDS summary codes, so that the individual taking the test can look for occupations most closely resembling his or her summary code. Finally, test directions instruct the individual to search for occupations resembling all permutations of the obtained summary code. These occupations would represent secondary and tertiary interests. Most people complete the SDS in 40 to 60 minutes.

Reliability/Validity

The evidence for the reliability, validity, and effects of the SDS on the test taker is summarized in the manual (Holland, 1979). Holland (1979) reports that

in one sample of male (N=105) and female (N=104) college students and trainees, previously administered tests were rescored to obtain odd-even scores. The corrected split-half reliability coefficients for the summary scales range from .83 to .95. According to Holland (1979), the 38-item summary scales formed by adding all R-items, all I-items, and so on, have a high degree of internal consistency. Holland (1979) also reports moderate to high retest reliability for a small sample of adults, aged 22 to 59, who were tested over time intervals of one to four weeks. Finally, Norris, Hatch, Engelkes, and Winborn (1979) state that "the three-letter summary codes have sufficient test-retest reliability to be useful, and the internal consistency measures demonstrate moderate reliability" (p. 438).

With the 1977 edition of the SDS, Holland used an additive scoring system which is simpler than the scoring system used in the 1970 edition. Holland (1979) states that the shift has not affected the predictive validity or the codes obtained from the SDS. When the two methods of scoring were compared with respect to their predictive validity over a three-year interval for a sample of 30 college students, differences in percentage of hits were minimal.

Several studies have tested the predictive validity of the 1970 edition of the SDS. Gottfredson and Holland

(1975b) tested the predictive validity of both the SDS summary codes and each part of the SDS with samples of 894 men and 989 women. Subjects took the SDS at entry into two colleges and reported their occupational choices one and three years later. A person's high-point code was found to moderately predict the category of occupational choice three years later. Gottfredson and Holland also found that each part of the SDS considered separately has moderate predictive validity. O'Neil and Magoon (1977) assessed a sample of 171 freshman males whose first-letter code on the SDS was I. The students were tested again in their senior year. Their SDS codes predicted the code of their major field (63% hits), their occupational choice at graduation (61% hits), and their occupational plans five years later (62% hits). Norris et al. (1979) report that the the item content and the format of the 1970 edition of the SDS reflect clear content validity and that construct validity is substantial with the constructs in Holland's theory of vocational choice.

According to Holland (1979),

the similar reliability and validity of the new and old SDS's is expected, because the tests share the same items except for two slightly revised competency items and sixteen new occupational titles in the Occupations section. (p. 50)

Self-Directed Search Form Easy (SDS-E)

According to Holland (1979), the Form Easy was developed for adults and adolescents who are poor readers. The format is similar to that of the SDS except that the number of items is reduced slightly, directions and statements requiring responses are more simply written, the Self-Estimates section has a simpler format, and two instead of three summary codes are obtained. To date, reliability and validity of the SDS-E have not been determined. However, Holland makes the assumption that the two forms have about equal validity because of the large item overlap.

Procedures

The SDS and the SDS-E were administered to both nonlearning disabled and learning disabled high school students. Since learning disabled students in the district spend one or two periods each school day in the resource room, they were tested during these periods. Nonlearning disabled students were tested during their study hall period. Each group of students was tested twice, once with the SDS and once with the SDS-E. There was a two-week interval between the first testing and the second testing. To control for the effect of test order, half of the students in each group took the SDS on the first testing, and half took the SDS-E. During the second testing session, subjects received the

opposite form of the test.

Initially, instructions standardized by the investigator were read to students (see Appendix B). These instructions were specific to the particular test being taken. Holland (1979) advises that errors are reduced when proctors are available to assist individuals during test administration and scoring. Therefore, both LD and NLD students were cautioned to read test directions carefully and seek help if they became confused.

After all LD and NLD subjects had been given both the SDS and the SDS-E, the investigator and an assistant checked each test for errors in following directions and in self-scoring. Each test was coded in the following manner: (a) no errors, (b) errors not affecting the high-point summary code, and (c) errors resulting in change in high-point summary code. When errors resulted in change in the individual's high-point summary code, that individual was assigned the corrected code. When an individual obtained a tied high-point summary code on either the SDS or the SDS-E, the other form of the test was examined. For example, if an individual received a tied high-point code of RI on the SDS, the SDS-E was examined to see which of the two codes received the highest score. That code would then be assigned to the individual on the SDS.

Design

After all subjects in both the LD and the NLD group were given both the SDS and the SDS-E, all tests were checked for errors in following directions and in self-scoring, and for accuracy of high-point Holland codes.

One question this study attempted to answer was whether or not the frequency of students classified in each of the six Holland personality types would be the same for learning disabled as for nonlearning disabled subjects. To answer this question, a chi-square test of homogeneity (Downie & Heath, 1983) was used on frequency of learning disabled and nonlearning disabled students assigned to each of the six Holland codes as measured by the SDS (subjects were assigned to the code on which they had the highest SDS summary score). A nonsignificant Chi-Square would indicate that the frequency of students falling into the six Holland types is independent of the presence or absence of disability. In other words, the vocational personalities and interests of learning disabled students would not be significantly different from those of nonlearning disabled students.

A second question this study attempted to answer was whether or not the SDS-E might be more appropriate than the SDS for use with learning disabled students. To

answer this question, coefficients of equivalence and stability were calculated between the SDS and the SDS-E for each of the six Holland summary scores for both learning disabled and nonlearning disabled students. Following this, a test for the difference between correlation coefficients for uncorrelated data (Downie & Heath, 1983) was calculated for each of the six Holland summary scores. Significance on some or all of these tests would indicate that the SDS and the SDS-E yield different results for learning disabled and nonlearning disabled students. Although such a finding would not establish the superiority of the SDS-E for use with learning disabled students, it would be an indication that such a superiority might exist.

In order to further investigate the question as to whether or not the SDS-E might be more appropriate for use with learning disabled students, test protocols were examined for number of errors in following directions and in self-scoring made by learning disabled students on both the SDS and the SDS-E. A record was made of the number of learning disabled students who made errors on the SDS only and on the SDS-E only. The difference between these proportions was tested for significance using McNemar's technique (cited in Stanley & Glass, 1970) to test the difference between proportions for correlated data. If a significantly larger proportion of

learning disabled students make errors on the SDS only than make errors on the SDS-E only, this would be further evidence that the SDS-E is more appropriate for use by learning disabled students.

To provide further evidence relating to appropriateness of the SDS and the SDS-E for LD students, another, similar analysis of errors was conducted. This time, however, the categories were changed. Students making no errors in following directions and in self-scoring, or making errors which did not cause a change in high-point Holland code were placed in one category. Those students making errors which resulted in a change in high-point code were placed in the other category. The same test of the difference between correlated proportions was used on this data.

CHAPTER IV

RESULTS

The purpose of this study was to investigate whether learning disabled high school students have vocational interests and personalities as varied as those of nonlearning disabled high school students as measured by the Self-Directed Search (SDS). The SDS is a self-administered and self-scored personality/interest inventory developed by Holland (1977). The study also considered whether the SDS Form Easy (SDS-E) is more appropriate than the SDS for use with learning disabled students. The following two research questions were addressed in this study:

1. Is the proportion of students classified in each of the six Holland personality types the same in learning disabled high school students as in nonlearning disabled high school students?

2. Might the SDS-E be more appropriate than the SDS for learning disabled high school students?

Descriptive Data

The records of all learning disabled high school students in a large, metropolitan school district in

West Texas were examined by a panel of three experts. The experts determined whether or not each potential subject met the Federal definition of learning disabilities. Ninety-six learning disabled (LD) students were chosen from the initial pool of 190 students classified as LD by the school district. After the LD subjects were identified, they were matched with a sample of 96 NLD high school students from the same district. Matching was deemed advisable since random assignment was impossible. Matching was done on the basis of sex, ethnicity, and socioeconomic status (SES).

Each group consisted of 70 males and 26 females. Three ethnic categories were represented in each group including 59 Anglos, 25 Blacks, and 12 Hispanics. The mean age of the LD group was 16.6 years, and the mean age of the NLD group was 16.3 years. Socio-economic status was determined according to the occupation of the major breadwinner in each subject's family. Students were assigned to one of seven SES categories. Numbers of LD students in each of the seven respective socio-economic categories from one to seven were 4, 13, 15, 23, 20, 13, and 8 (1 is the highest SES category and seven is the lowest). The median SES was 4.20. The numbers of NLD students in each of the seven respective socio-economic categories were 7, 15, 18, 24, 14, 13, and 5. The median SES was 3.83.

The SDS and the SDS-E were administered to both the LD and the NLD group. Each group of students was tested twice, once with the SDS and once with the SDS-E. There was a two-week interval between the first and second testings. To control for test order effect, half of the students in each group took the SDS on the first testing, and half took the SDS-E. During the second testing session, subjects took the opposite form of the test.

Chi-Square Test of Homogeneity

Each protocol was checked for accuracy of scoring and the high-point code on the SDS was determined for all subjects in both the LD and the NLD groups. Subjects were assigned to one of the six Holland codes (R, I, A, S, E, or C). A 2 X 6 chi-square test of homogeneity (Downie & Heath, 1983) was then used on frequencies of learning disabled and nonlearning disabled students assigned to each of the six codes. The purpose of this analysis was to answer question one: Is the proportion of students classified in each of the six Holland personality types the same in learning disabled high school students as in nonlearning disabled high school students?

The chi-square test of homogeneity is appropriate for this study since it is frequently used to determine if two or more populations are homogeneous, or if the

data distributions are similar with respect to a particular criterion variable (Downie & Heath, 1983). If the chi-square is nonsignificant, it can be assumed that the two populations are homogeneous. In the present study, a nonsignificant chi-square would indicate that the frequency of students falling into each of the six Holland types is independent of the presence or absence of disability. Thus, a nonsignificant chi-square would support the first research hypothesis.

Table 1 presents the observed and expected frequencies of LD and NLD students holding each of the Holland high-point codes. Results of the chi-square test are also presented.

An inspection of this table reveals that the chi-square of 5.41 is nonsignificant. Therefore, it can be concluded that learning disabled high school students do not differ significantly from nonlearning disabled students in terms of their vocational interests and personalities as measured by the SDS. While it is true that many of the learning disabled subjects were assigned high-point codes of R, almost as many were assigned high point codes of S. Comparison of the high-point codes of learning disabled students with those of nonlearning disabled subjects reveals that the nonlearning disabled group also were assigned

Table 1

Chi-square and Observed and Expected Frequencies for
Holland High-Point Codes of LD and NLD Students

	R	I	A	S	E	C	N	df	χ^2
<hr/>									
LD									
ob.	33	5	8	38	6	6			
ex.	(29)	(6.5)	(8)	(37.5)	(10)	(5)			
<hr/>									
NLD									
ob.	25	8	8	37	14	4			
ex.	(29)	(6.5)	(8)	(37.5)	(10)	(5)			
<hr/>									
Total	58	13	16	75	20	10	192	5	5.41*
<hr/>									

* $p = 0.37$

predominately to high-point codes of R and S.

While there were some minor differences in the other six categories, these were nonsignificant. It is interesting to note, however, that more than twice as many nonlearning disabled as learning disabled students were included in the E (Enterprising) category. According to Holland (1979), individuals with E high-point codes tend to have leadership, interpersonal, and persuasive competencies. These individuals also perceive themselves as aggressive, popular, self-confident, sociable, and possessing leadership and speaking abilities. Because they so often encounter failure both in their schoolwork (Cruickshank, 1980; Kirk & Chalfant, 1983) and in their interpersonal skills (Kronick, 1978), it may be unlikely that learning disabled individuals would see themselves as enterprising.

It is also interesting to note the number of learning disabled subjects who were included in the A (Artistic) category. Since many artistic activities do not require academic skills, learning disabled individuals may feel more confident performing them. Also, according to Holland (1979), artistic individuals are often disorderly, emotional, impractical, and impulsive. The fact that learning disabled individuals often exhibit these same personality traits

(Cruickshank, 1980) may explain why some feel comfortable with artistic activities.

Coefficients of Equivalence and Stability

The second research question asked whether or not the SDS-E might be more appropriate than the SDS for use with learning disabled high school students. To answer this question, the SDS and the SDS-E were administered to both nonlearning disabled and learning disabled high school students. Each group of students was tested twice, once with the SDS and once with the SDS-E. After a two-week interval, both groups of students were tested again. To control for test order effect, half of the students in each group took the SDS on the first testing, and half took the SDS-E. During the second testing session, subjects took the opposite form of the test.

After all tests were corrected for errors in following directions and in self-scoring, coefficients of equivalence and stability (Noll, Scannell, & Craig, 1979) were calculated for each of the six Holland summary scores of the SDS and the SDS-E for the learning disabled and nonlearning disabled subjects combined. Coefficients of equivalence and stability were also calculated for each of the six Holland summary scores of the SDS and the SDS-E for the learning disabled group only and for the nonlearning disabled group only.

Following this, a test for the difference between correlation coefficients for uncorrelated data (Downie & Heath, 1983) was calculated for each of the six Holland summary scores. Significance on some or all of these tests would indicate that the SDS and the SDS-E yield different results for learning disabled and nonlearning disabled students.

Table 2 presents the coefficients of equivalence and stability for all subjects, the NLD group and the LD group combined. Table 3 presents the results of the tests for the difference between correlation coefficients for uncorrelated data.

Several points need to be made regarding the findings presented in Tables 2 and 3. Observation of the coefficients of equivalence and stability for the combined groups ($N = 192$) range from .6893 to .8374. In their discussion of interpretations of reliability information, Noll et al. (1979) report that "the reliability coefficients for instruments such as personality tests and interest inventories are usually lower, the average being most often in the .70s and .80s, although some have not attained a correlation as high as .70" (p. 109). Thus, examination of the coefficients of equivalence and stability for the

Table 2

Coefficients of Equivalence and Stability

Coefficients of equivalence and stability			
Holland Summary	Combined	NLD	LD
Scores	(<u>N</u> =192)	(<u>n</u> =96)	(<u>n</u> =96)
R	.8374	.8435	.8307
I	.6893	.7665	.6083
A	.7405	.8238	.6530
S	.7783	.8131	.7482
E	.7097	.7688	.6116
C	.7485	.8356	.6304

Note. $p < .001$ (all coefficients).

Table 3

Tests for the Difference Between Correlation
Coefficients for Uncorrelated Data, LD vs. NLD groups

Holland Summary Scores						
	R	I	A	S	E	C
<u>z</u>	0.23	2.12*	2.65**	1.15	2.12*	3.16**

* $p < .05$. ** $p < .01$.

combined groups in Table 2 indicate that the SDS and the SDS-E are equivalent forms.

However, since the coefficients of equivalence and stability for the combined groups include the LD subjects who may have difficulty reading the test items, following directions, or scoring the results, it may be more useful to examine the correlations calculated only from the scores of the NLD subjects. When the LD group scores are not included in the calculation of the coefficients of equivalence and stability, the new coefficients range from .7685 to .8435 (see Table 2), with four of the coefficients in the .80s. Thus, with the LD sample excluded, there is strong evidence of equivalent forms reliability.

In order to answer the question of whether or not the SDS-E might be more appropriate for use with learning disabled students, a test for the difference between two correlation coefficients for uncorrelated data (Downie & Heath, 1983) was calculated for each of the six Holland summary scores. Inspection of Table 3 reveals that the correlations between Holland summary scores for subtests I, A, E, and C for learning disabled students were significantly lower than the correlations for nonlearning disabled students on these same subtests. Therefore, in at least four of the six categories of Holland summary scores, the SDS and SDS-E

yield different results for learning disabled and nonlearning disabled students.

The lack of such a difference in the R and S categories may have occurred because items on these subtests of the SDS are equally appropriate for both LD and NLD high school students. Another possible explanation is related to the fact that most of the learning disabled subjects were assigned to these two categories, indicating their vocational interests were high in these areas. Since interests were high in the R and S categories, learning disabled subjects may have paid more attention to items in these subtests or may have been more highly motivated to respond carefully and accurately. Another possibility is that because of their high interests in these categories, items in the R and S subtests contain more words in learning disabled students' reading vocabularies. Consequently, the students may have been better able to comprehend the items in the R and S categories than items in the other four categories. Thus, for categories R and S, there is no evidence that the SDS-E is better than the SDS for learning disabled students. Evidence was found to support the possibility that the other four categories of the SDS-E may be more appropriate than the SDS for learning disabled students.

It should be noted that, in one sense, correlation

coefficients were artificially inflated since they were calculated after errors in following directions and in self-scoring in all tests were corrected. Without correction of errors, it is possible that the differences between the LD and NLD groups would have been even greater, and it is possible that a significant difference would have been obtained between correlation coefficients for NLD and LD for the R and S categories as well. When either the SDS or the SDS-E is used with learning disabled students, examiners are cautioned to check test protocols for errors before using either instrument for career counseling purposes.

In conclusion, correlations of equivalence and stability between Holland summary scores on the SDS and the SDS-E for learning disabled students are significantly lower in four of the six categories of Holland-type scores than the correlations of equivalence and stability for nonlearning disabled students. While these findings do not establish the superiority of the SDS-E for use with learning disabled students, they are indication that such a superiority may exist.

Comparison of Errors Made by NLD and LD Groups
On the SDS and the SDS-E

To further investigate whether or not the SDS-E might be more appropriate for use with learning disabled students, SDS and SDS-E test protocols were examined for

number of errors by LD and NLD students in following directions and/or in scoring the test.

The analysis of errors was carried out in two phases. First, a comparison was made of number of errors versus no errors on the SDS and SDS-E for both the LD group and the NLD group. This analysis made no differentiation between errors which did not change the high-point code and errors which did change the high-point code.

The second phase of error analysis dealt with errors affecting high-point codes on the SDS and the SDS-E for both the LD group and the NLD group. Since high-point summary codes are used to determine occupational interests and personalities, errors affecting these codes would provide misleading occupational information. Therefore, it is important to consider which of the two forms of the test result in fewer errors affecting high-point summary codes.

To compare the number of errors made on the SDS and the SDS-E by both the LD and the NLD groups, the number of students in each group making errors on the SDS only and on the SDS-E only was determined and tested for significance using McNemar's technique to test the difference between proportions for correlated data (cited in Glass & Stanley, 1970). Table 4 presents the distribution of the number of LD and NLD students making

Table 4

Crossbreak Tables for Errors on the
SDS and SDS-E

SDS-E	SDS	
	Errors	No errors
LD (<u>n</u> =96)		
No errors	32	8
Errors	53	3
NLD (<u>n</u> =96)		
No errors	29	14
Errors	47	6

Note. Comparisons made between 32 and 3 (LD), and
between 29 and 6 (NLD).

errors on the SDS only and on the SDS-E only.

Table 5 presents the numbers of LD and NLD students making no errors or errors with no change in high-point code and numbers making errors resulting in change in high-point codes on the SDS and the SDS-E.

To compare number of errors versus no errors on the SDS and SDS-E for both the LD group and the NLD group, a test was made of the difference between proportions for correlated data using McNemar's technique (cited in Glass & Stanley, 1970). This test compares number of students making one or more errors on the SDS and no error on the SDS-E with students who make no error on the SDS and one or more errors on the SDS-E (for LD, 32 and 3 respectively; for NLD, 29 and 6 respectively). Significantly fewer errors were made by both groups on the SDS-E, $z(\text{LD}) = 4.90$, $p < .0001$; $z(\text{NLD}) = 3.89$, $p < .0001$. Thus, when consideration is given only to the numbers of errors in following directions and in self-scoring versus no errors made by both the LD and the NLD groups on the SDS and the SDS-E, students in both groups make fewer errors on the SDS-E.

Inspection of Table 5 reveals the number of LD and NLD subjects who made errors in following directions and in self-scoring on the SDS and the SDS-E that resulted in changed high-point Holland summary codes. Again,

Table 5

Crossbreak Tables for Errors Changing
High-Point Codes on SDS and SDS-E

SDS-E	SDS	
	Errors with change	No error/ error with no change
LD (<u>n</u> =96)		
No errors/		
errors with no change	14	77
Errors with change	1	4
NLD (<u>n</u> =96)		
No errors/		
errors with no change	8	81
Errors with change	1	6

Note. Comparisons made between 14 and 4 (LD), and
between 8 and 6 (NLD).

McNemar's technique for testing the difference between correlated proportions was used. A significantly larger proportion of LD students made errors that resulted in a changed high-point code on the SDS than on the SDS-E (14 and 4 respectively), $z = 2.59$, $p < .01$. However, there was no significant difference in the number of errors resulting in changed high-point codes made by NLD subjects on the SDS and the SDS-E (8 and 6 respectively), $z = .54$.

Analyses of errors in following directions and in self-scoring made by both groups of subjects on the SDS and the SDS-E reveal that when comparisons are made only of the numbers of errors versus no errors on the SDS and the SDS-E, both LD and NLD subjects make fewer errors on the SDS-E. However, when comparisons are made of errors resulting in changed high-point codes, the SDS-E is more appropriate for the LD group but no more appropriate than the SDS for the NLD group. Therefore, the SDS-E may be a better instrument for use with learning disabled high school students, especially if examiners do not plan to check for and correct errors in following directions and in self-scoring.

CHAPTER V

SUMMARY

Many learning disabled adults have difficulty finding employment, and if they do find jobs, they often cannot keep them. Those who do find and keep employment, often find themselves in dead-end, boring jobs that do not make use of their abilities and aptitudes. One reason for the employment problems of many learning disabled individuals may be that public schools are not providing them with appropriate career/vocational education. Learning disabled high school students are usually provided with one of three public school programs: (a) an academic program, (b) a regular vocational education program, or (c) a special education vocational education program.

Learning disabled students enrolled in the academic program are seldom provided with the opportunity to receive career/vocational counseling and training. Learning disabled students are often refused admittance to regular vocational education programs on the grounds that they will not be able to pass the safety tests or that they be injured. Those who are admitted often have difficulty and have to drop out because instructors do not modify or adapt the curriculum to accommodate the

abilities and disabilities of learning disabled students. Special education vocational programs are usually designed for mentally retarded students and provide training for jobs which many learning disabled individuals would find tedious and unchallenging.

Because of the lack of appropriate career/vocational educational planning for learning disabled students, many post-secondary learning disabled individuals are working in occupational environments not suited to their abilities, interests, and personalities. While nonhandicapped individuals often have a variety of choices of work environments, learning disabled individuals often do not. Job training programs for learning disabled individuals are frequently similar to those for mentally retarded persons. Consequently, these programs may prepare learning disabled participants for jobs fitting a constricted stereotypic view of their abilities and interests rather than for jobs that are congruent with their personalities.

One way to reduce or eliminate the employment difficulties of learning disabled individuals would be for the public schools to develop career/vocational programs specifically for learning disabled students. For such programs to be effective, they should be tailored to suit the occupational interests and personalities of each participant. If the occupational

interests and personalities of learning disabled students are as varied as are those of nonlearning disabled students, then career/vocational educational training programs should take these into account.

One traditional method for measuring occupational interests has been through the administration of occupational interest inventories. Although this is frequently done with nonhandicapped students, it is seldom done with learning disabled students. Even when nonhandicapped students' occupational interests are assessed, not much more is done in terms of career/vocational guidance and training. Such guidance and training is even less frequent with handicapped students, particularly learning disabled students. Thus, an important first step in developing appropriate career/vocational education programs for learning disabled students is to assess their occupational interests and personalities.

Statement of the Problem

The purpose of this study was to investigate whether learning disabled high school students have vocational interests and personalities as varied as those of nonlearning disabled high school students. If such differences are found to exist, then they should be considered in the development of career/vocational

counseling and training programs for learning disabled individuals.

John Holland's (1977) Self-Directed Search (SDS) was the instrument used to measure occupational interests and personalities of learning disabled and nonlearning disabled high school students. There are two forms of the test, the SDS and the SDS Form Easy (SDS-E). The SDS-E was designed by Holland for use with poor readers. This study also considered whether or not the SDS-E is more appropriate than the SDS for use with learning disabled high school students.

To answer the preceding questions, the following research hypotheses were tested:

1. The frequency of students falling into each of the six Holland types will be independent of the presence or absence of disability.

2. Coefficients of equivalency and stability between each of the Holland type summary scores on the SDS and the SDS-E will be significantly lower than the coefficients of equivalency and stability for scores on the SDS and SDS-E for nonlearning disabled students.

3. The proportion of learning disabled students making errors on the SDS only will be significantly higher than the proportion of learning disabled students making errors on the SDS-E only.

Review of the Literature

The literature pertaining to appropriate career/vocational programming for learning disabled students was reviewed in seven sections:

1. Definition of learning disabilities
2. Career education: a rationale
3. Career/vocational assessment
4. Career education for the handicapped
5. Career/vocational assessment of the handicapped
6. Theories of career development
7. Holland's Theory of Vocational Choice

Review of the literature indicates that learning disabled adolescents and adults are not making adequate postsecondary work adjustment. Conclusions drawn from the literature review suggest that the primary cause for this failure may be lack of appropriate public school career/vocational education programming for learning disabled students. Although learning disabled secondary students frequently can choose from the academic program, the regular career/vocational education program, or the special education career/vocational education program, none of these may be suited to the unique learning needs of learning disabled students. Few public school career/vocational education programs exist which are designed specifically for learning disabled students.

From the review of the literature, it is apparent that public school career/vocational educational programs suited specifically for learning disabled students should be developed. Presently, learning disabled students are being trained for and placed in menial, low-level jobs based on a stereotypic view of their interests and/or personalities. A first step in developing appropriate career/vocational educational programs for this group should be to investigate whether or not such a stereotypic view is based on fact.

Subjects

To compare the diversity of vocational interests and personalities among learning disabled and nonlearning disabled high school students, 96 learning disabled (LD) high school students were matched with 96 nonlearning disabled (NLD) high school students. The LD group consisted of 70 males and 26 females. Three ethnic groups were represented, including 59 Anglos, 25 Blacks, and 12 Hispanics. Only those Hispanics whose primary language was English were chosen for the study. Primary language was determined from test protocols and from asking each student's teacher. The mean age of the LD group was 16.6 years. Socio-economic status was determined according to the occupation of the major breadwinner in each student's family. The scale yields seven categories with 1 being the highest SES category.

and 7 being the lowest. The numbers of LD students in each of the seven respective SES categories were 4, 13, 15, 23, 20, 13, and 8. The median SES was 4.20.

Obviously, the number of nonlearning disabled males and females, and Anglos, Blacks, and Hispanics in the NLD group were identical to that in the LD group. The mean age of the NLD group was 16.3 years. The numbers of NLD students in each of the seven respective SES categories were 7, 15, 18, 24, 14, 13, and 5. The median SES was 3.83.

Sampling Procedure

The records of all learning disabled high school students in a large, metropolitan school district in West Texas were examined by a panel of three experts. The experts determined whether or not each potential subject met the Federal definition of learning disabilities. From the initial pool of 190 students classified as LD by the school district, a total of 103 students were chosen by the panel as meeting the federal criteria. Seven students dropped out of the study before the conclusion due to absence, moving out of town, etc., leaving a final sample of 96 learning disabled students.

After the LD subjects were identified, they were matched with a sample of 96 NLD high school students from the same district. Matching was done on the basis

of sex, ethnicity, and SES.

Instruments

Three instruments were used in the study. The Revised Occupation Rating Scale (Warner et al., 1949) was used to determine SES of each subject. SES information was derived from data sheets filled out by each subject. The SDS and the SDS-E (Holland, 1977) were used to assess subjects' occupational interests and personalities. The SDS and the SDS-E were administered to both the LD and the NLD group. Each group of students was tested twice, once with the SDS and once with the SDS-E. A two-week interval passed between the first and second testings. To control for test order effect, half of the students in each group took the SDS on the first testing, and half took the SDS-E. During the second testing session, subjects took the opposite form of the test.

Results

Chi-Square Analysis

After all subjects in both the LD and the NLD group were given both the SDS and the SDS-E, each protocol was checked for accuracy of scoring, and the Holland high-point summary code was determined for all subjects in both the LD and the NLD group. Subjects were assigned to one of the six Holland codes (R, I, A, S, E, or C). A

2 X 6 chi-square test of homogeneity (Downie & Heath, 1983) was then used on frequencies of learning disabled and nonlearning disabled students assigned to each of the six codes as measured by the SDS (subjects were assigned to the code on which they had the highest SDS summary score). The purpose of this analysis was to answer the following question: Is the proportion of students classified in each of the six Holland personality types the same in learning disabled high school students as in nonlearning disabled high school students?

The analysis produced a chi-square of 5.41 with 5 degrees of freedom ($p=0.37$). The chi-square was nonsignificant indicating that the LD and the NLD groups are homogeneous. Thus, the first research hypothesis stating that the frequency of students falling into each of the six Holland types is independent of the presence or absence of disability was supported.

Tests for the Difference Between Correlation Coefficients

The second research question posed by this study was whether or not the SDS-E might be more appropriate than the SDS for use with learning disabled high school students. To answer this question, coefficients of equivalence and stability were calculated between the SDS and the SDS-E for each of the six Holland summary

scores for both LD and NLD subjects. For each of the six subtests, LD and NLD coefficients were compared by means of a test for the difference between correlation coefficients for uncorrelated data. Results of these analyses revealed that the correlations of equivalence and stability between Holland summary scores on the SDS and the SDS-E for learning disabled students were significantly lower in four of the six categories of Holland-type scores than the correlations of equivalence and stability for nonlearning disabled students. These findings support the second research hypothesis that correlations of equivalence and stability between Holland type scores on the SDS and the SDS-E will be significantly lower than the correlations of equivalence and stability for nonlearning disabled students.

This analysis also revealed some interesting data on equivalent forms reliability of the SDS-E. The SDS-E is a relatively new instrument and no studies were found addressing this issue. Coefficients of equivalence and stability between the SDS and the SDS-E for the combined LD and NLD groups were calculated and range from .6893 to .8374 with all but two of the coefficients in the .70s. When LD group scores are not included in the calculation of the coefficients of equivalence and stability, the coefficients range from .7685 to .8435 with all but two of the coefficients in the .80s. Noll,

Scannell, and Craig (1979) discuss reliability coefficients typically found for personality tests and interest inventories versus those for other standardized tests. They report that "the reliability coefficients for instruments such as personality tests and interest inventories are usually lower, the average being most often in the .70s and .80s, although some have not attained a correlation as high as .70" (p. 109). Thus, examination of the coefficients of equivalence and stability for the combined groups indicates that the SDS and the SDS-E are equivalent forms, while examination of the coefficients for the NLD group only provides even stronger evidence of equivalent forms reliability.

Error Analyses

To further investigate whether or not the SDS-E might be more appropriate for use with learning disabled students, SDS and SDS-E test protocols were examined for number of errors in following directions and in self-scoring made by the LD group and by the NLD group.

In the first phase of error analysis a comparison was made of number of errors versus no errors on the SDS and the SDS-E for both the LD group and the NLD group. In order to compare number of errors versus no errors on the SDS and the SDS-E for both the LD group and the NLD group, a test was made of the difference between proportions for correlated data using McNemar's

technique (cited in Glass & Stanley, 1970). This test compares the number of students making errors on the SDS only versus number of students making errors on the SDS-E only. For both groups, the proportion making errors on the SDS only was significantly greater than the proportion making errors on the SDS-E only ($z[LD] = 4.90$, $p < .0001$; $z[NLD] = 3.89$, $p < .0001$).

In the second phase of error analysis, a comparison was made of errors affecting high-point codes on the SDS and the SDS-E for both the LD and the NLD group. McNemar's technique was again used. In this analysis, a significantly larger proportion of LD students made errors which resulted in a changed high-point code on the SDS only than on the SDS-E only ($z = 2.59$, $p < .01$). However, there was no significant difference in the number of errors resulting in changed high-point codes made by NLD subjects on the SDS only and on the SDS-E only ($z = .54$). Results of these two error analyses provide further evidence that the SDS-E is more appropriate for use with LD students. These results also support the third research hypothesis that learning disabled students will make fewer errors in following directions and self-scoring on the SDS-E than on the SDS.

Implications

Results of this study provided evidence that

learning disabled high school students have vocational interests and personalities as varied as those of nonlearning disabled students. While many learning disabled students were assigned high-point Holland codes of R, almost as many were assigned high-point codes of S with many fewer LD students being assigned into each of the other codes. The same was true in the NLD group.

In the sample of learning disabled students in this study, more students fell into the S category of Holland types than fell into the R category (R=33, S=38).

Therefore, public school programs which prepare learning disabled students only for Realistic occupations might be inappropriate for many learning disabled students. In fact, for those learning disabled students who have Social interests and personalities, training them for and placing them into Realistic occupations is inappropriate since, according to Holland (1985), Social types have an aversion to activities, competencies, and interests preferred by Realistic types and vice versa. Thus, Social types working in Realistic environments are likely to experience a great deal of job dissatisfaction and instability.

To prevent inappropriate placement, assessment of interests and personalities should be part of vocational training programs designed to prepare learning disabled students for specific jobs. Once student interests are

determined, then these programs should prepare students for occupations suited to those interests. For example, learning disabled students with high social interests could be trained to work in social settings such as schools, churches, etc. Students with artistic characteristics and interests could be trained to work in artistic environments such as art galleries, theaters, etc. If the vocational interests and personalities of learning disabled individuals are considered in job training and placement, these individuals may be more likely to experience job satisfaction and success.

Another finding of this study was that the SDS-E is more appropriate than the SDS for use by learning disabled students. Therefore, career/vocational counselors should consider using the SDS-E rather than the SDS in assessing vocational interests and personalities of learning disabled students.

It was also determined from this study that learning disabled students made fewer errors in following directions and in self-scoring on the SDS-E than on the SDS. Significantly more of the errors made on the SDS resulted in changed Holland high-point summary codes. Since these codes are necessary in determining accurate occupational information, it is important that they be derived correctly. Thus, if

examiners do not plan to check for and correct errors made by LD students in following directions and in self-scoring, then the SDS-E, not the SDS, should be used with learning disabled individuals. If the SDS is used with learning disabled students, examiners should check for errors if they expect to obtain accurate information about the subjects taking the test.

Additional research is needed in several areas. Investigations should be made to determine the predictive validity of the SDS when it is used with learning disabled individuals. Holland (1985) discusses the value of comparing vocational aspirations of individuals with their Holland summary codes. He states that when vocational aspirations and high-point summary codes match, then individuals are likely to experience job satisfaction and occupational success. Thus, the vocational aspirations of learning disabled students should be compared with their Holland summary codes to determine potential job stability and success. The differences between vocational aspirations and Holland summary codes of learning disabled should be compared with those of nonlearning disabled individuals to see which group, if either, has more matches. In addition, replications of the present study should be made to further investigate the vocational interests and personalities of learning disabled as well as other

handicapped individuals when compared to the interests and personalities of nonhandicapped individuals. Finally, more investigations should be made of the appropriateness of the SDS-E for use with groups of subjects who may have difficulty taking and scoring the SDS.

The primary goal of this study has been to investigate whether or not learning disabled individuals are being occupationally stereotyped and trained for and placed into inappropriate occupational environments. Hopefully, many similar studies will follow.

REFERENCES

- Botterbusch, K. F. (1976). A guide to job site evaluation. Menomonie, WI: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Materials Development Center.
- Brolin, D. E. (1972). Value of rehabilitation services and correlates of vocational success with the mentally retarded. American Journal of Mental Deficiency, 76, 644-61.
- Brolin, D. E. (1978). Life centered career education: A competency based approach. Reston, VA: The Council for Exceptional Children.
- Brolin, D. E. (1982). Vocational preparation of persons with handicaps. Columbus, OH: Charles E. Merrill.
- Brolin, D. E. (1983). Life centered career education: A competency based approach. Reston, VA: The Council for Exceptional Children.
- Brolin, D. E., & Brolin, D. E. (1979). Vocational education for special students. In D. Cullinan & M. Epstein (Eds.), Special education for adolescents (pp. 119-154). Columbus, OH: Charles E. Merrill.
- Brolin, D. E., & D'Alonzo, B. J. (1973). Critical issues in career education for handicapped students. Exceptional Children, 45(4), 246-253.
- Brolin, D. E., Durand, R., Kromer, K., & Muller, P. (1975). Post-school adjustment of educable retarded students. Education and Training of the Mentally Retarded, 10, 144-149.
- Brolin, D. E., & Elliot, T. R. (1984). Meeting the lifelong career development needs of students with handicaps. Career Development for Exceptional Individuals, 7(1), 12-21.
- Brolin, D. E., Elliot, T. R., & Corcoran, J. R. (1984). Career education for persons with learning disabilities. Learning Disabilities, 3(1), 1-13.

- Bryan, T. (1978). Social relationships and verbal interactions of learning disabled children. Journal of Learning Disabilities, 11, 107-115.
- Campbell, D. P. (1974). Manual for the Strong-Campbell Interest Inventory T325 (merged form). Stanford, CA: Stanford University Press.
- Campbell, D. P., & Hansen, J. C. (1981). Manual for the SVIB-SCII. Stanford, CA: Stanford University Press.
- Cattell, R. B., Eber, H. W., & Tatsuoka, M. (1970). Handbook for the sixteen personality factor questionnaire. Champaign, IL: IPAT.
- Cegelka, P. T. (1979). Career education. In D. Cullinan & M. H. Epstein (Eds.), Special education for adolescents (pp. 155-184). Columbus, OH: Charles E. Merrill
- Cegelka, P. T. (1985). Career and vocational education. In W. H. Berdine & A. E. Blackhurst (Eds.), An introduction to special education (pp. 572-612). Boston: Little, Brown and Company.
- Chaffin, J., Davison, R., Regan, C., & Spellman, C. (1971). The follow-up studies of former mentally retarded students from the Kansas work study project. Exceptional Children, 37, 733-738.
- Conte, L. E. (1983). Vocational development theories and the disabled person: Oversight or deliberate omission? Rehabilitation Counseling Bulletin, 26(5), 316-328.
- Cox, S. (1977). The learning disabled adult. Academic Therapy, 13(1), 79-87.
- Crimando, W., & Nichols, B. (1982). A model for vocational exploration and selective placement of the learning disabled. Vocational Evaluation and Work Adjustment Bulletin, 16(3), 98-102.
- Cronbach, L. J. (1960). Essentials of psychological testing (2nd ed.). New York: Harper and Brothers.
- Cruickshank, W. (1980). Learning disabilities: The struggle from adolescence toward adulthood. Syracuse, NY: Syracuse University Press.

- Cummings, R. W., & Maddux, C. D. (in press). Parenting the learning disabled: A realistic approach. Springfield, IL: Charles C. Thomas.
- Cummings, R., & Maddux, C. D. (1984). Learning disabled children: Parental expectations. Techniques: A Journal for Remedial Education and Counseling, 1, 81-87.
- D'Alonzo, B. J., Marino, J. F., & Kauss, M. W. (1984). Mesa Public School comprehensive career and vocational education program for disabled students. Career Development for Exceptional Individuals, 7(1), 22-29.
- Dahl, P. (1978, April). A practical guide to mainstreaming. School Shop, 66-69.
- DeLoach, T. F., Earle, J. M., Brown, B. S., Poplin, M. S., & Warner, M. M. (1981). L. D. teachers' perceptions of severely learning disabled students. Learning Disability Quarterly, 4, 343-358.
- Deshler, D. (1978). Issues related to the education of learning disabled adolescents. Learning Disability Quarterly, 1(4), 2-9.
- DeVoge, S. (1975). Personality variables, academic major, and vocational choice: A longitudinal study of Holland's theory. Psychological Reports, 37, 1191-1195.
- Downie, N. M., & Heath, R. W. (1983). Basic statistical methods (5th ed.). New York: Harper & Row.
- Eber, H. W. (1976). Personality and psychopathology inventories. In B. Bolton (Ed.), Handbook of measurement and evaluation in rehabilitation (pp. 101-116). Baltimore, MD: University Park Press.
- Eysenck, H., & Eysenck, S. (1968). Manual for the Eysenck personality inventory. Educational and Industrial Testing Service. San Diego.
- Fafard, M., & Haubrich, P. (1981). Vocational and social adjustment of learning disabled young adults: A follow-up study. Learning Disability Quarterly, 4, 122-130.

- Federal Register. (1977, August). Procedures for evaluating specific learning disabilities. Washington, DC: Department of Health, Education, and Welfare.
- Federal Register. (1978, September). Position statement on comprehensive vocational education for all handicapped persons. 43(186).
- Geib, B., Guzzardi, L. & Genova, P. (1981). Intervention for adults with learning disabilities. Academic Therapy, 16(3), 317-325.
- Glass, G.V., & Stanley, J. C. (1970). Statistical methods in education and psychology. Englewood Cliffs, NJ: Prentice-Hall.
- Goldhammer, K. A. (1972). A career curriculum. In K. Goldhammer & R. Taylor (Eds.), Career Education: Perspectives and promises. Columbus, OH: Charles E. Merrill.
- Gottfredson, L. S., & Holland, J. L. (1975b). Some normative self-report data on activities, competencies, occupational preferences, and ability ratings for high school and college students, and employed men and women. JSAS Catalog of Selected Documents in Psychology, 5, 192 (Ms No. 859).
- Gottfredson, L. (1977). A multiple labor market model of occupational achievement. Research Report No. 225. Center for Social Organization of Schools, Johns Hopkins University, Baltimore, MD.
- Gottfredson, L. S. (1978). An analytical description of Employment according to race, sex, prestige, and Holland type of work. Journal of Vocational Behavior, 13, 210-221.
- Gottfredson, G., Holland, J. & Ogawa, D. (1982). Dictionary of Holland occupational codes. Palo Alto, CA: Consulting Psychologists Press.
- Gray, R. (1981). Services for the LD adult: A working paper. Learning Disability Quarterly, 4(4), 426-434.
- Gysbers, N. C., & Moore, E. J. (1975). Improving guidance programs. Englewood Cliffs, NJ: Prentice-Hall.

- Hanson, L. S. (1977). An examination of the definitions and concepts of career education. Washington, DC: US Government Printing Office.
- Hathaway, S. R., & McKinley, J. C. (1951). The Minnesota Multiphasic Personality Inventory. New York: Psychological Corp.
- Heller, H. W. (1981). Secondary education for handicapped students: In search of a solution. Exceptional Children, 47, 582-583.
- Hightower, M. D. (1975). Status is certain death. Journal of Rehabilitation, 42, 2.
- Hoffman, P. R. (1973). Work evaluation: An overview. In R. E. Hardy & J. G. Cull (Eds.), Vocational evaluation for rehabilitation services. Springfield, IL: Charles C Thomas.
- Hohenshil, T. H. (1984). School psychologists facilitating career development programs in secondary education. Career Development for Exceptional Individuals, 7(2), 51-58.
- Hohenshil, T. H., & Warden, P. (1978). The emerging vocational school psychologist: Implications for special needs students. The School Psychology Digest, 1, 5-17.
- Holcomb, W. R., & Anderson, W. P. (1977). Vocational guidance research: A five-year review. Journal of Vocational Behavior, 10, 341-346.
- Holland, J. (1959). A theory of vocational choice. Journal of Counseling Psychology, 6, 35-45.
- Holland, J. (1966). The psychology of vocational choice. Waltham, MA: Blaisdell.
- Holland, J. (1977). The Vocational Preference Inventory. Palo Alto, CA: Consulting Psychologists Press.
- Holland, J. (1979). Professional manual for the Self-Directed Search. Palo Alto, CA: Consulting Psychologists Press.
- Holland, J. (1985). Making vocational choices: A theory of vocational personalities and work environments (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.

- Hoyt, K. B. (June 10, 1975). Career education and the business-labor industry community. Paper presented at the National Apprenticeship and Training Directors Conference, Washington, DC.
- Hoyt, K. B. (1977). A primer for career education. Washington DC: US Government Printing Office.
- Kapes, J. T., & Parrish, L. H. (1983). Career guidance and assessment tools for handicapped persons. New Directions in Testing and Measurement, 20, 47-61.
- Kendall, W. (1981). Affective and career education for the learning disabled adolescent. Learning Disability Quarterly, 4(1), 69-73.
- Kerr, C. (1979). Giving youth a better chance: Options for education, work. Carnegie Council of Policy Studies in Higher Education. San Francisco: Jossey-Bass.
- Kidd, J. W., Cross, T. J., & Higginbotham, J. L. (1967). The world of work for the educable mentally retarded. Exceptional Children, 33, 648-649.
- Kirk, S., & Chalfant, J. C. (1984). Academic and developmental learning disabilities. Denver: Love Publishing Co.
- Kirk, S., & Gallagher, J. (1983). Educating exceptional children (4th ed.). Boston: Houghton Mifflin.
- Knight, O. B. (1972). Occupational aspirations of the educable mentally retarded. Training School Bulletin, 69, 54-58.
- Kokaska, C. J. (1968). The occupational status of the educable mentally retarded: A review of follow-up studies. Journal of Special Education, 2, 369-377.
- Kokaska, C. J. (1983). Career education: A brief overview. Teaching Exceptional Children, 15, 194-195.
- Kokaska, C. J., & Kolstoe, O. P. (1977). Special educators' role in career education. Journal of Career Education, 3, 4-18.
- Kolstoe, O. P., & Frey, R. M. (1965). A high school work-study program for mentally subnormal students. Carbondale: Southern Illinois University Press.

- Kronick, D. (1978). An examination of psychosocial aspects of learning disabled adolescents. Learning Disabilities Quarterly, 1, 86-92.
- Kuder, F. (1966). Kuder Occupational Interest Survey. Chicago: Science Research Associates.
- Kuder, F., & Diamond, E. E. (1979). General manual for the Kuder DD Occupational Interest Survey. Chicago: Science Research Associates.
- Kuhn, E. A. (1966). A comparative analysis of the nature of EMR adolescents' expressed level of understanding of selected occupations. Unpublished Doctoral Dissertation, Michigan State University.
- La Greca, A. (1982). Social behavior and social perception in learning disabled children: A review with implications for social skills training, Journal of Pediatric Psychology, 6(4), 1981, 395-416.
- Levinson, E. M. (1984). Vocational/career assessment in school psychological evaluations: Rationale, definition, and purpose. Psychology in the Schools, 21, 112-117.
- Leviton, S. A., & Taggart, R. (1977). Jobs for the disabled. Washington, DC: George Washington University Center for Manpower Studies.
- McDaniel, L. (1982). Changing vocational teachers' attitudes toward the handicapped. Exceptional Children, 48(4), 377-378.
- Marino, J. F. (1981). Vocational education: Available but allusive for handicapped students. Phoenix: Arizona Department of Education.
- Marland, S. P. (1971). Career education now. Speech presented before the annual convention of the National Association of Secondary School Principals, Houston, TX.
- Meyen, E. (1978). Exceptional children and youth: An introduction. Denver: Love Publishing Co.
- Miller, D. C. (1977). Handbook of research design and social measurement (3rd ed.). New York: David McKay Co.

Mount, M., & Muchinsky, P. (1978). Person-environment congruence and employee job satisfaction: A test of Holland's theory. Journal of Vocational Behavior, 13, 84-100.

National Advisory Committee on Handicapped Children. (1968). First annual report, subcommittee on education of the committee on labor and public welfare, U.S. Senate. Washington, DC: U.S. Government Printing Office.

National Assessment of Education Progress. (1978a). It's what you don't know that hurts. NAEP Newsletter, 11(5), 1(a).

National Assessment of Education Progress. (1978b). Wrap-up: Social studies/citizenship. NAEP Newsletter, 11(5), 1-2(b).

Neff, W. S. (1970). Vocational assessment--theory and models. Journal of Rehabilitation, 36, 27-29.

New York Association for the Learning Disabled. (1982). New York ACLD Interim Report (Contract No. 171365). New York: Author.

Noll, V. H., Scannell, D. P., & Craig, R. C. (1979). Introduction to educational measurement (4th ed.). Boston: Houghton Mifflin.

Norris, W., Hatch, R., Engelkes, J. & Winborn, B. (1979). The career information service (4th ed.). Chicago: Rand McNally.

Office of Civil Rights Report. (1979). Washington, DC: U. S. Department of Health, Education, and Welfare, Office of Education.

Office of Civil Rights Report. (1980). Washington, DC: U. S. Department of Health, Education, and Welfare, Office of Education.

Olshansky, S. (1969). An examination of some assumptions in the vocational rehabilitation of the mentally retarded. Mental Retardation, 7(1), 51-53.

O'Neil, J. M., & Magoon, T. M. (1977). The predictability of Holland's investigative personality type and consistency levels using the Self Directed Search. Journal of Vocational Behavior, 10, 39-46.

- Osipow, S. (1983). Theories of career development (3rd ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Phelps, L. A., & McCarty, T. (1984). Student assessment practices. Career Development for Exceptional Individuals, 7(1), 30-38.
- Plue, W. (1984). Employment patterns of the mildly retarded. The Journal for Vocational Special Needs Education, 7(1), 23-28.
- Poplin, P. D. (1981). The development and execution of the vocational IEP: Who does what, when, to whom. In T. H. Hohenshil & W. T. Anderson (Eds.), School psychological services in secondary vocational education. Blacksburg, VA: Virginia Tech.
- Prediger, D. J. (1982). Dimensions underlying Holland's hexagon: Missing link between interests and occupations? Journal of Vocational Behavior, 21, 259-287.
- President's committee on mental retardation: Trends in state services. (1976). Washington, DC: U. S. Government Printing Office.
- Pruitt, W. A., & Longfellow, R. E. (1970). Work evaluation: The medium and the message. Journal of Rehabilitation, 36, 8-9.
- Rezeghi, J. A. (1979). Final report of supplement to consumer involvement in career and vocational education (unrevised draft). Washington, DC: American Coalition of Citizens with Disabilities.
- Ringness, T. A. (1961). Self-concepts of children of low, average, and high intelligence. American Journal of Mental Deficiency, 65, 453-461.
- Robinson, J. B., Athanasiou, R., & Head, K. B. (1969). Measures of occupational attitudes and occupational characteristics. Ann Arbor: Institute of Social Research, University of Michigan.
- Sankovsky, R. (1970). Toward a common understanding of vocational evaluation. Journal of Rehabilitation, 36, 10-12.

- Sears, P. S. (1940). Levels of aspiration in academically successful and unsuccessful children. Journal of Abnormal and Social Psychology, 35, 498-536.
- Siconne, E. R. (1983). A strategic new vision for education. Education Network News, 2, 2-3.
- Siegel, E., & Gold, R. F. (1982). Educating the learning disabled. New York: MacMillan Publishing Co.
- Sitlington, P. (1979). Vocational assessment and training of the handicapped. Focus on Exceptional Children, 12(4), 1-12.
- Sitlington, P. (1981). Vocational and special education in career programming for the mildly handicapped adolescent. Exceptional Children, 47, 592-598.
- Sitlington, P. L., & Wimmer, D. (1978). Vocational assessment techniques for the handicapped adolescent. Career Development for Exceptional Individuals. 1(1), 74-79.
- Slaney, R. B. (1980b). An investigation of racial differences on vocational variables among college women. Journal of Vocational Behavior, 16, 197-207.
- Slaney, R. B., & Brown, M. T. (1983). Effects of race and socioeconomic status on career choice variables among college men. Journal of Vocational Behavior, 23, 257-269.
- Stodden, R. A., & Ianacone, R. N. (1981). Career/vocational assessment of the special needs individual: A conceptual model. Exceptional Children, 47, 600-608.
- Stodden, R. A., Ianacone, R. N., & Lazer, A. L. (1979). Occupational interests and mentally retarded people: Review and recommendations. Mental Retardation, 17, 294-299.
- Strickland, C. G., & Arrell, V. M. (1967). Employment of the mentally retarded. Exceptional Children, 34, 21-24.
- Super, D. E. (1976). Career education and the meanings of work. Washington DC: US Government Printing Office.

- Swanson, H. L., & Watson, B. L. (1982). Educational and psychological assessment of exceptional children: Theories, strategies, and applications. St. Louis, MO: The C. V. Mosby Co.
- Tenth Institute on Rehabilitation Services. (1972). Vocational evaluation and work adjustment services in vocational rehabilitation. Washington, DC: Rehabilitation Services Administration, Office of Human Development.
- Thompson, L., & Wimmer, D. (1976). Organizational parameters in planning for a work/study program. In Parameters of planning: The work-study coordinator. Lawrence, KS: University of Kansas, Habilitation Personnel Training Project.
- Timmerman, W. J., & Doctor, A. C. (1974). special applications of work evaluation ntechniques for prediction of employability of the trainable mentally retarded. Stryker, OH: Quadco Rehabilitation Center.
- Tobias, J. (1970). Vocational adjustment of young retarded adults. Mental Retardation, 8(3), 13-16.
- Vautour, J. A. C., Stocks, C., & Kolek, M. M. (1983). Preparing mildly handicapped students for employment. Teaching Exceptional Children, 16(1), 54-58.
- Wall, H. W., Osipow, S. H., & Ashby, J. D. SVIB scores, occupational choices, and Holland's personality types. Vocational Guidance Quarterly, 15, 201-205.
- Walsh, W. B., & Lacey, D. W. (1969). Perceived change and Holland's theory. Journal of Counseling Psychology, 16, 348-352.
- Walsh, W. B., & Russel, J. H. (1969). College major choice and personal adjustment. Personnel and Guidance Journal, 47, 685-688.
- Warner, W., Meeker, M. & Eels, K. (1949). Social class in America. Chicago: Science Research Associates.
- Washburn, W. (1975). Where to go in voc-ed for secondary LD students. Academic Therapy, 11, 31-35.

- White, W., Deshler, D., Schumaker, J., Warner, M., Alley, G. & Clark, F. (1983). The effects of learning disabilities on postschool adjustment. Journal of Rehabilitation, 49(1), 46-50.
- Wiggins, J. (1976). The relation of job satisfaction to vocational preferences among teachers of the educable mentally retarded. Journal of Vocational Behavior, 8, 13-18.
- Winer, J., Wilson, D. & Pierce, R. (1983). Using the Self-Directed Search-Form E with high school remedial reading students. Vocational Guidance Quarterly, 32, 130-134.
- Ysseldyke, J. (1977). Assessing the learning disabled youngster: The state of the art. Research Report No. 1, Minneapolis, Minn.: Institute for Research on Learning Disabilities. University of Minnesota, Nov. 1977.
- Ysseldyke, J. (1978). Remediation of ability deficits: some major questions, pp. 117-134 in L. Mann, L. Goodman, and J. Wiederholt (eds.), Teaching the Learning Disabled Adolescent. Boston: Houghton Mifflin.

APPENDICES

A. DATA SHEET

B. STANDARDIZED INSTRUCTIONS

APPENDIX A: DATA SHEET

NAME _____

AGE _____

RACE (circle): HISPANIC BLACK ANGLO

ADDRESS _____

PHONE _____

SCHOOL _____ GRADE _____

WHERE DOES YOUR FATHER WORK?

WHAT IS HIS JOB THERE?

WHERE DOES YOUR MOTHER WORK?

WHAT IS HER JOB THERE?

HAVE YOU EVER WORKED OR ARE YOU WORKING NOW?

IF YOU HAVE WORKED, WHERE HAVE YOU WORKED?

IF YOU HAVE WORKED, WHAT KIND OF WORK HAVE YOU DONE?

APPENDIX B: STANDARDIZED INSTRUCTIONS

Hello, my name is Rhoda Cummings and I am a student in Education at Texas Tech University.

I am going to give you a Vocational Interest Inventory called the Self-Directed Search, or the SDS for short. Have you ever wondered what kind of work you might be happiest doing? The SDS may give you some ideas about what occupations you might enjoy once you get out of school. It is not a test. You do not get any kind of grade.

It's important for you to try your best when you answer the questions on the SDS. It's called the Self-Directed Search because you can take it by yourself. It gives you all the directions you need to know about how to take it. So you need to be sure to read the directions very carefully, beginning with the front cover.

Let's take a minute and look at the booklet together.

* Distribute pencils, booklet, and Occupations Finder *

** Distribute the SDS to half the group and the SDS-E **
** to the other half **

First of all, write your name, age, and sex on the front cover of the booklet. Next, open the yellow form to page 4, and the white form to page 3. Be sure to carefully read the directions at the top of the page. Notice that you are to fill in the boxes - "L or D" in the yellow booklet, and "Y or N" in the white booklet. Do not try to blacken each box in. That will take too much time. You only need to make a mark in one box or the other. Make sure you mark in one box of each pair of boxes. Notice the three large boxes. You are to write in a total number of either "L's" (yellow booklet) or "Y's" (white booklet) in these boxes.

Now let's quickly look at the other pages in the booklets. On each page be sure to read the directions and mark the boxes like the directions tell you to do. DON'T FORGET TO READ THE DIRECTIONS CAREFULLY!

Now look at page 9 in both booklets. You are to rate yourself HIGH, AVERAGE, LOW under each of the six categories. BE SURE TO READ THE DIRECTIONS AND DO WHAT THEY SAY TO DO.

Now look at page 10. Follow the directions carefully. Do exactly what they tell you to do. You will finish page 10 by filling in the three big boxes with three letters (two big boxes with two letters for the white form). These three letters are called your Summary Code. After you get your Summary Code, go to page 11 and read the directions very carefully.

For page 11, you will have to use this little book called the Occupations Finder. Read the directions carefully, and use the Occupations Finder to help you find out which jobs would be best for you.

You are through with the inventory when you finish page 11. When you finish, you should have some idea of what jobs might be good for you. I will take the booklets with me today, but I will make copies of page 10 and 11, and give them to your teacher so she will have them in case you forget which jobs were best for you.

In two weeks, I am coming back and give you the form of the test you did not take today. Both forms give the same information about jobs.

Do you have any questions before we begin?