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VARIABLES AFFECTING THE POST HIGH SCHOOL OUTCOMES OF STUDENTS WITH LEARNING DISABILITIES

By

Carolyn Anne McAllister

A DISSERTATION

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

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ABSTRACT

VARIABLES AFFECTING THE POST HIGH SCHOOL OUTCOMES OF STUDENTS WITH LEARNING DISABILITIES

By

Carolyn Anne McAllister

The focus of this study is to examine the educational and employment related outcomes of individuals with learning disabilities as they leave high school and make choices about postsecondary education and employment. First, the paper presents an overview of the issues and ways that social workers can support adolescents with learning disabilities as they decide on educational and career goals, and transition from public school systems. The paper provides a theoretical background on the definition of learning disabilities and some of the recent changes in this disability category. Next, the paper reviews research on the individual, familial, and social impacts of a learning disabilities diagnosis. The paper then provides an overview of researched interventions for adolescents with learning disabilities.

This study also examined demographic, economic, educational, and other relevant variables through the National Longitudinal Survey of Youth, 1997 cohort. One way ANOVAs were completed to determine the ways in which the sample of individuals with learning disabilities were similar or different from persons with other impairments and persons with no identified impairment. Findings showed that the educational and income outcomes seen in previous research after one to three years after leaving high school continue as students are three to seven years out of high school. Lent, Hackett, and Brown's (1994, 1996, 1999) Social Cognitive Career Theory (SCCT) was then utilized to identify potential factors influencing students with learning disabilities educational performance. Using the National Longitudinal Survey of Youth, 1997 Cohort (NLSY97), hierarchical regression analyses were completed for individuals with a diagnosed learning disability, for individuals with other identified learning or medical impairments, and for individuals with no identified impairments. Support for the SCCT model was found in all three groups of participants, although the individual variables influencing each group vary.

Lastly, implications for this research in the areas of social work practice, research and policy are discussed. Areas for future research are discussed, and the strengths and limitations of this study are reviewed. The importance of including assessment and interventions for adolescents and young adults with learning disabilities in all areas of social work practice is emphasized.

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DEDICATION

This dissertation is dedicated to the memory of two dear friends and colleagues, Trudy Jorgenson and Melissa Valentine Hill Davis. Their passion for work with persons with disabilities, and their passion for life, even when facing the end of their lives, continually inspires me. It is also dedicated to the memory of my aunt, Susie Schaaf, who lived as she wanted to the end.

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CHAPTER ONE

INTRODUCTION

Learning disability (or specific learning disability) is one of the eleven categories of disability to receive services through the Individuals with Disabilities Education Act (IDEA). Within IDEA, specific learning disability is defined as:

> (A) In general.--The term 'specific learning disability' means a disorder in 1 or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations.

> (B) Disorders included.--Such term includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.

(C) Disorders not included.--Such term does not include a learning problem that is primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage. (IDEA 2004, § 602).

The best estimates that are available for the population of persons with learning disabilities come from the school systems, as this is not a question asked in the U.S. Census ("Disability status", 2003). In the 1976/1977 school year, 1.8% of the K-12 student body in the United States received special education services based on a diagnosis of specific learning disability. By the 1980/1981 school year, the proportion

grew to 3.6% percent of the K-12 student body. Since the 1994/1995 school year,

between 5.4% to 6.2% of the student population has had a diagnosis of a specific learning disability. In the 2006-2007 school year, this equaled approximately 2.7 million children, and is approximately half of all students receiving special education services through IDEA ("Children and Youth with Disabilities", 2008). The National Research Center on Learning Disabilities estimates that 6% of the population has a learning disability in the area of reading alone (NRCLD, 2007).

The Individuals with Disabilities Education Act requires that students with special education services receive education in the least restrictive environment, be included in measures for annual yearly progress if at all possible, and receive yearly transition related planning to assist the student set and meet goals for postschool life, particularly in areas such as vocation and education (IDEA 2004). These requirements are intended to prepare students with learning and other disabilities for work or further education after leaving the public school system.

Despite the measures of special education departments, postsecondary institutions, and other professionals working with individuals with learning disabilities to promote vocational and educational opportunities, students with learning disabilities continue to have poorer post high school outcomes than students without this diagnosis. Approximately 25% of students with learning disabilities in public school will leave school without a high school diploma (Wagner, Newman, Cameto, Garza & Levine, 2005). Approximately one in three students with learning disabilities will go on to receive some postsecondary education, but only a small proportion of that group will complete any postsecondary degree (Blackorby & Wagner, 1995; Murray, Goldstein, Nourse &

Edgar, 2000; Rojewski, 1999; Sitlington & Frank, 1990; Wagner et al., 1991; Wagner et al., 2005). In addition, students with learning disabilities typically attend two-year colleges or vocational programs rather than four-year institutions (Wagner et al., 2005). Although individuals with learning disabilities will work at rates similar to the general population, they will be engaged in lower wage work with fewer benefits; women are affected, in particular (Murray et al., 2000; Rojewski, 1999; Sitlington & Frank, 1990; Wagner et al., 2005). However, for those students with learning disabilities who do graduate from a postsecondary institution, their wages have been reported to be commensurate to those of students without the diagnosis (Dickinson & Verbeek, 2002; Murray et al., 2000).

In 2001, the Cooperative Institutional Research Program, a survey of freshman in four-year colleges, found that 2.4% of all college freshman identified as having a learning disability. This is approximately 40% of all individuals with an identified disability entering four-year college programs (Henderson, 2001). A number of studies have attempted to monitor and understand the outcomes for students with learning disabilities as they leave high school, particularly in the areas of postsecondary education, vocational training, and employment. Although much can be learned from this research, to this point, the research, primarily, has looked either at particular subgroups of individuals with learning disabilities or has not followed students with learning disabilities for more than a few years after they leave the public school system. A few small studies have looked at the long-term outcomes for individuals with learning disabilities, but much of that research has focused on particular student populations.

The main focus of this dissertation is to gain a better understanding of some of the issues faced by adolescents with learning disabilities and their families as they make decisions about postsecondary education, and bring a social work perspective to an area of practice that is well researched in other professions but is not widely explored in social work. This major focus will be broken down into three areas. First, this study will provide an overview of the research on individuals with learning disabilities and potential issues in the transition process out of high school and into various post school outcomes. Next, this study will provide data regarding the educational and employment outcomes of individuals with learning disabilities after they leave high school, utilizing individuals with other identified impairments and individuals with no identified impairments as comparison groups. Finally, this study will test the applicability of the Social Cognitive Career Theory in explaining educational level variability for individuals with learning disabilities. This dissertation is in a multiple manuscript format. Chapter One provides the introduction to the topics, Chapters Two through Four are individual manuscripts, which are described below, and Chapter Five provides an overall discussion of the implications for the research conducted for this dissertation as well as outlining potential future areas of research, and implications for practice and policy.

Chapter Two Overview

This article provides an overview of the current issues and trends in working with adolescents and young adults with learning disabilities, and is geared towards a social work audience. With that perspective in mind, the paper begins by discussing the history of the diagnosis of learning disability and the changes in definition and assessment over the years. A review of the literature on the various individual, family, and social impacts

of learning disability are reviewed. Next, it provides an overview of the particular educational and vocational issues that adolescents with learning disabilities may face as they transition out of a public school environment. Finally, it provides some suggestions for theoretical framework and interventions that social workers might employ in a variety of human service settings who are providing services to this client population.

Chapter Three Overview

Utilizing the National Longitudinal Survey of Youth, 1997 (NLSY 1997) cohort, this paper explores the similarities and differences between individuals with learning disabilities, individuals with other identified impairments, and individuals who are not diagnosed with a learning disability or other impairment. The NLSY 1997 began with a sample of 8,894 adolescents aged twelve through sixteen in 1997, and has been following this sample annually since then ("NLSY User's Guide", 2007). The latest data available are from Round Nine, which are data collected in 2005. Using previous longitudinal studies of post high school outcomes for individuals with learning disabilities as well as other research on issues that impact adolescents and young adults with learning disabilities, a number of variables of interest are compared between the three identified groups (identified learning disability, other identified impairment affecting emotions or learning and individuals with no identified impairment). These variables include the highest grade achieved, sex, race/ethnicity, mental health scale, participant income, high school Grade Point Average (GPA), measure of perceived school fairness, Scholastic Achievement Test (SAT) scores, Armed Services Vocational Aptitude Battery (ASVAB) scores, percent chance the student, when first measured, believed they would be in college in five years, percent chance the student, when first measured, believed they

would be working at least part-time in five years, and the percent of peers who will go to college. This paper will also discusses whether or not the age of the participant is related to the participant's highest grade achieved in college and their income. The findings of these analyses, discussion of their importance in research on learning disabilities and some implications for future research on these topics is discussed.

Chapter Four Overview

The Social Cognitive Career Theory (SCCT) was initially developed by Lent, Brown and Hackett (1994) to explain the processes that individuals go through to develop vocational interests, make choices about education and work, act on these choices, and potentially find success in a career. Like other social cognitive theories, SCCT is based on the work of Bandura and his theories of social learning, particularly focusing on the area of self-efficacy (1986, 1997). Unlike previous career development theories, however, the SCCT model takes into account both constructs such as vocational interests, abilities, and vocational goals, and processes such as career choice and vocational change during a career (Lent, Hackett & Brown, 1996). This is a move away from the historical vocational trait theories that previously dominated career development theory (Lent, Brown & Hackett, 1994). This model also uses Bandura's triadic reciprocal model of causality, where person specific attributes, external environmental factors and overt behaviors are interactive variables, rather than the previous models of causation that did not take into account the changes that overt behaviors can make on attributes and the external environment (Bandura, 1986, Lent et al., 1996).

SCCT posits that there are three interacting variables; self- efficacy, outcome expectations, and interest/ goal formation, that work together to affect the process of

career development (Lent et al., 1994; Lent et al., 1996; Swanson & Fouad, 1999). Self efficacy, which is described as the most important of the three variables, is defined by Bandura as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391) and is a "dynamic set of beliefs that are specific to particular performance domains and interact complexly with other person, behavior and contextual factors" (Lent et al., 1996, p. 83). Outcome expectations are the outcomes the individual believes will occur if a particular behavior is performed (Lent et al., 1996). Finally, interest and goal formation is the actual process of making individual vocational plans (Lent et al., 1994).

The variables of self-efficacy, outcome expectations, and goals are further influenced by individual variables such as gender, ethnic background, socioeconomic status, disability status, which are termed "person inputs" (Lent, Hackett & Brown, 1999). These variables are seen to alter the individual's opportunity structures. As these variables change the environment around the individual, the individual will then alter their self-efficacy beliefs, outcome expectations, and goals. For example, in this theory, women may not enter the field of math and science because social pressures to stay out of the field may create environmental hardships, thereby creating a situation where a person's self-efficacy beliefs change, leading to a move away from math and science as a career (Lent et al., 1994).

This paper examines the utility of the Social Cognitive Career Theory in explaining the factors that might impact students with learning disabilities' decisions to attain a high school diploma and/or a postsecondary degree. Variables corresponding to the SCCT were examined in the National Longitudinal Survey of Youth, 1997 cohort.

These include the highest grade achieved, sex, race/ethnicity, mental health rating, educational level of biological mother and father, amount of government assistance received, participant income, high school GPA, measures of the school environment, percent chance the student, when first measured, believed they would be in college in five years, and the percent of peers who will go to college. Hierarchical regression was utilized to test models for the group of individuals with learning disabilities, the group of individuals with other types of disabilities, and then for individuals with no diagnosed learning disability. The results of models are compared, and the results are discussed in terms of previous research. Implications for the use of SCCT to direct interventions for adolescents and young adults with learning disabilities are discussed.

Conclusion

The conclusion of this dissertation includes a chapter that provides an overall discussion of the three papers and how they relate to each other. Implications for future research in this content area as well as a discussion on how this information might be used in social work practice and policy are addressed.

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CHAPTER TWO

Working with Adolescents and Young Adults with Learning Disabilities: A Social Work Perspective

Abstract

This paper presents an overview of the issues and possible ways that social workers can support adolescents with learning disabilities as they decide on educational and career goals, leave the public school system, and enter postsecondary life. The paper begins by giving a background on the definition of learning disabilities and some of the recent changes in this disability category. Next, the paper reviews research on the individual, familial, and social impacts of a diagnosis of learning disabilities. The paper then provides an overview regarding the areas of researched interventions for adolescents with learning disabilities as they transition out of public school. Finally, implications for social work practice and research with this population are addressed.

Introduction

Social workers, based on our many roles in human service systems, work with individuals with a wide variety of disabilities on a daily basis. This may occur by mandate, such as in school districts or mental health settings, where issues related directly to the disability may be the focus of treatment, or in agencies where services may be indirectly related to or independent of the individual's particular disability (Beaulaurier & Taylor, 2001; Jonson-Reid, Kontak, Citerman, Essma & Fezzi, 2004; Quinn, 1995). Within all of these settings, social workers will work with individuals with learning disabilities, one of the largest sub-groups of individuals with disabilities. In

order to empower individuals with learning disabilities to reach their educational, vocational, and other goals, it is important that social workers gain a stronger understanding of this diagnosis, and particularly how it impacts individuals in adolescence and young adulthood in relation to educational and career-related goals.

According to the U.S. Census, approximately 18% of Americans have at least one impairment legally considered to be a disability ("Disability Status: 2000", 2003). Within the public education system, that number decreases slightly to 13.8 percent of all children enrolled ("Children and Youth with Disabilities", 2008). One group of individuals with disabilities that social workers may work with in all areas of practice, not only within a school setting, is persons with learning disabilities.

Individuals with learning disabilities (also called specific learning disabilities) comprise one of the largest groups of individuals with disabilities. The U.S. Department of Education estimates that approximately half of all children with disabilities in public school (approximately 2.7 million in the 2006-2007 school year) have a learning disability ("Children and Youth with Disabilities", 2008). Although there are no statistics on the numbers of adults with learning disabilities, it is clear from research that this is diagnosis with lifelong implications, so it is likely the prevalence of the diagnosis remains fairly stable (Goldberg, Higgins, Raskind & Herman, 2003; Hollenbeck, 2007; NRCLD, 2007). Boys tend to be diagnosed with learning disabilities more often and earlier in their academic careers (Bloom & Day, 2006; "Children with and Youth Disabilities", 2007; Wagner, Newman & Cameto, 2004). Individuals with a diagnosis of learning disabilities, by definition, have near typical to above typical intelligence, but have difficulties with one or more areas of academics (IDEA, 2004).

This diagnosis, although primarily focused on the acquisition and performance of academic tasks, has a number of other potential implications for the individual. Children and adults with learning disabilities may struggle with: (a) social skills issues (e.g., Bauninger Edelstein, & Morash, 2005; Cartledge, 2005; Elias, 2004; Goldberg et al., 2003; Kavale & Forness, 1996; Weiner, 2003); (b) with self-concept and self-esteem (e.g., Bryan, 2005; Cosden & Eliott, 1999; Elias, 2004; Weiner, 2003); (c) with mental health and substance abuse issues (e.g., Beichtman, Wilson, Douglas & Adlaf; 2001; Bryan, 2005; Cosden, 2001; Morrison & Cosden, 1997; Hoy et al., 1997); and (d) with selfefficacy and self-determination (e.g., Brinkerhoff, 1996; Field, 1996; Field, Hoffman & Posch, 1997; Lackeye, Margalit, Ziv & Ziman, 2006). Beyond this set of psychosocial issues, there are possible impacts regarding completing high school, going on to postsecondary education or training, and working. Approximately 25% of students with learning disabilities in public school will leave school without a high school diploma (Wagner, Newman, Cameto, Garza & Levine, 2005). Approximately one in three students with learning disabilities will go on to receive some postsecondary education, but only a small proportion of that group will complete any postsecondary degree (Blackorby and Wagner, 1995; McAllister, 2008; Murray, Goldstein, Nourse & Edgar, 2000 Sitlington & Frank, 1990; Rojewski, 1999; Wagner et al., 1991; Wagner et al., 2005). Although individuals with learning disabilities will work at rates similar to the general population, often they are engaged in lower wage work with less benefits; this is especially true for women (Murray et al., 2000; Rojewski, 1999; Sitlington & Frank, 1990; Wagner et al., 2005).

This paper presents an overview of the issues and possible ways that social workers can support adolescents with learning disabilities as they decide on educational and career goals, leave the public school system, and enter postsecondary life. The paper begins by giving a background on the definition on learning disabilities and some of the recent changes in this disability category. Next, the paper reviews research on the individual, familial, and social impacts of a diagnosis of learning disabilities. The paper then provides an overview of researched interventions for adolescents with learning disabilities as they transition out of public school. Finally, implications for social work practice with this population are addressed.

Definition of Learning Disabilities

The definition of learning disabilities emerged from years of research done by neurologists, psychologists, and educators on individuals experiencing particular academic deficits, most commonly reading based deficits, but who had average or above average intellectual functioning. The diagnosis was first given the label "word-blindness" in the early 20th Century as a way to describe the symptoms of these individuals (Hallahan & Mercer, 2001). It has since become apparent that people could experience academically related deficits in other areas than reading such as math, writing, and language (Hallahan & Mercer, 2001; Kavale & Forness, 2000). Over time, learning disability has been defined as disorders specific to the areas of spoken language, academic, or thinking disorders, and is separated from other kinds of global learning delays or disorders such as mental retardation (Kavale & Forness, 2000; NRCLD, 2007). Another key feature of this diagnosis is that it is based on psychological process deficits,

rather than other potential etiologies for learning deficits such as autism, emotional disorders, sensory disorders, environmental or cultural factors (NRCLD, 2007).

The definition has not undergone radical change since Samuel Kirk first described learning disabilities in the book *Educating Exceptional Children* (1962) as:

...a retardation, disorder, or delayed development in one or more of the processes of speech, language, reading, writing, arithmetic, or other school subject resulting from a psychological handicap caused by a possible cerebral dysfunction and/ or emotional or behavioral disturbances. It is not the result of mental retardation, sensory deprivation, or cultural and instructional factors. (p. 263)

The current definition of learning disabilities in the Individuals with Disabilities Education Act, 2004, is the following:

> (A) In general.--The term 'specific learning disability' means a disorder in 1 or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations.

> (B) Disorders included.--Such term includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.

(C) Disorders not included.--Such term does not include a learning problem that is primarily the result of visual, hearing, or motor disabilities,

of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage. (IDEA 2004, § 602).

Beyond updating the language, these two definitions have minor, although long discussed and debated, differences (Hallahan & Mercer, 2001; Kavale & Forness, 2000). The biggest change that should be noted is that emotional and behavioral disturbances cannot be the root cause of the learning disability in the current definition (Kirk, 1962; IDEA, 2004). Although the definition of learning disabilities has remained fairly consistent, particularly since it was included within the Education for all Handicapped Children Act (PL 94-142, 1977), many other aspects of the diagnosis have changed over time. The two most pertinent are: (a) how learning disabilities are diagnosed; and (b) the prevalence of learning disabilities.

The manner of diagnosis of learning disabilities has varied over time and is still an issue of heated debate within the learning disability research community. Although the U.S. Department of Education has made statements supporting various diagnostic models over time, there has never been an agreed upon set of diagnostic criteria (IDEA, 2004). Each state, and in many cases, each school district, determines how they will identify and diagnose learning disabilities ("SLD Determination", n.d.). There are currently two major models used to conceptualize the diagnosis of learning disabilities.

Aptitude/ Achievement Discrepancy

The aptitude/ achievement discrepancy model has a long history, going back to early testing procedures done to identify individuals with "word blindness" beginning in the 1920's (Hallahan & Mercer, 2001). In this model, tests of aptitude, namely tests of intelligence, are compared to achievement tests in various academic subjects, and

significant discrepancies between what would be expected based on the intelligence test and how the student actually performs are examined as possible indicators of a learning disability. When PL 94-142 was enacted, the U.S. Office of Education came out in support of this model (Hallahan & Mercer, 2001). This model became an established method of learning disability diagnosis, and remains a major model in many school districts, and in many research studies done on learning disabilities (Fletcher Denton, & Francis, 2005; Hollenbeck, 2007).

A number of arguments have been made against sole use of an aptitude/ achievement discrepancy model to identify learning disabilities. First, this method means that children often are not formally diagnosed with learning disabilities until later in elementary school through high school (Fuchs & Mellard, 2007; Hollenbeck, 2007). There are a number of potential psychometric problems with use of the aptitude/ achievement model, including the potential for disproportionate identification of individuals based on minority status or the highly documented sociocultural biases in IQ tests (Fletcher et al., 2005; NRCLD, 2007; KewalRamani et al., 2007; Reis & Colbert, 2004).

Response to Intervention

The Response to Intervention models of learning disability diagnosis have been designed to address many of the concerns regarding the use of the aptitude/ achievement model. The major elements of the Response to Intervention models include the following: (a) providing high quality teaching practices and screening to determine instructional needs of all children entering the school system, (b) modeling and assessing of individual student progress, and increasingly intensive educational interventions for students who

are not advancing at typical rates, and then (c) if the student does make sufficient progress with the second level of intervention, she or he will be assessed for special education services (Hollenbeck, 2007). This model hinges on educators having access to best practice educational interventions that are effective to a wide variety of student learning needs (Fuchs & Mellard, 2007; Hollenbeck, 2007; "SLD Determination", 2007). The hope with this model is that students who are experiencing delays in academic achievement are getting their needs addressed in the least restrictive setting, per the IDEA mandates, and before they display failure in academic subjects (Fuchs & Mellard, 2007; Hollenbeck, 2007; "SLD Determination", 2007).

Current opinion held by most members of learning disabilities organizations is that aptitude/ achievement discrepancies are neither necessary nor sufficient for a diagnosis of learning disabilities. A minority opinion within members of learning disabilities organizations is that the aptitude/ achievement markers are appropriate but not sufficient for a diagnosis of a learning disability (NRCLD, 2007). Most professionals, along with the most current revision of IDEA, support a Response to Intervention approach that includes achievement assessment for all students (Fletcher et al., 2005; Fletcher, Morris, Morris & Lyon, 2005; Francis, Shaywitz, Stuebing, Shaywitz & Fletcher, 1996; Hollenbeck, 2007; IDEA, 2004; NRCLD, 2007).

Prevalence of Learning Disabilities

Another area of concern for many professionals is the rapid increase in numbers of persons being diagnosed with learning disabilities. For example, in the 1976/1977 school year, 1.8% of the K-12 student body in the United States received special education services based on a diagnosis of specific learning disability. By the 1980/1981

school year, the proportion grew to 3.6% percent of the K-12 student body. Since the 1994/1995 school year, between 5.4% to 6.2% of the student population had a diagnosis of a specific learning disability. This is approximately half of all students receiving special education services through IDEA ("Children and Youth with Disabilities", 2008). The National Research Center on Learning Disabilities estimates that 6% of the population has a learning disability in the area of reading alone (2007). It is difficult to identify all of the reasons that the proportion of individuals receiving a diagnosis of learning disabilities has increased so quickly. Persons with diagnoses of mental retardation or overall low academic achievement may be misdiagnosed as a learning disability, which is partially supported by the subsequent lower rates of diagnosis of mental retardation when rates of learning disability increased ("Children and Youth with Disabilities", 2008; Fletcher, Denton and Francis, 2005; Kavale & Forness, 1998; NRCLD, 2007). Also, concern about the potential overuse of a diagnosis of learning disability to receive accommodations, particularly at the college level, has been discussed (Kavale & Forness, 1998; Stanovich, 1999).

Impacts of Learning Disabilities

Like any other disability, a diagnosis of a learning disability affects each individual in a unique way, based on a variety of person and environmental factors. However, there are a number of features of learning disability that affect a significant proportion of the people with this diagnosis. The first is academic and cognitive deficits. Social skills issues also impact the way that learning disabilities are manifested in school and family relationships. The impact of family on the adolescent with a learning disability may also be different than for individuals without a disability. The social stigma of disability may impact the goals and expectations that the individual with a learning disability, family, educational and other professionals have for the student. Mental health and substance abuse, struggles with self-concept, and self-efficacy and self-determination skills are potential additional issues for individuals with learning disabilities.

Academic and Cognitive Issues

By definition, a learning disability "...may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations" (IDEA 2004, § 602). One likely consequence of these symptoms is challenges in the areas of academic skills. Historically, a student with a learning disability is often initially identified based on academic struggles and low grades (Fuchs & Mellard, 2007; Hollenbeck, 2007). This is also verified in many longitudinal studies looking at high school and post high school outcomes. Within the sample of students with disabilities identified in the National Educational Longitudinal Survey, individuals with learning disabilities had the lowest math and reading proficiencies of all other groups of students with disabilities who were sampled (Rossi, Herting, & Wolman, 1997). The National Longitudinal Survey of Youth-2 found that students with a diagnosed learning disability, on average, had math and reading achievement levels a little over three years lower than would be expected for their age and grade level (Wagner et al., 2003). Additionally, students with an identified learning disability had significantly lower grade point averages than students with no diagnosed learning disability within the National Longitudinal Survey of Youth, 1997 cohort (McAllister, 2008). All of these results point to the ongoing academic struggles for individuals with learning disabilities as they are in the K-12 school system.
Social Skills Issues

Social skills deficits is an important focus of study within the study of learning disability, with research in this area going back almost as long as the diagnosis has been in existence, although much of this research began in the 1980's (Bender, 2004; Hallahan & Mercer, 2001; Vaughn & Haager, 1994). One of the discussions among researchers is whether or not social skills deficits should be included as part of the diagnosis: whether or not the symptoms of learning disabilities potentially include social skills deficits, or if the psychosocial experience of having a learning disability potentially leads to social skills deficits (Bender, 2004; Cartledge, 2005; Kavale & Mostert, 2004; NRCLD, 2007). The area of social skills encompasses a number of more specific potential areas of concern, which include: verbal and nonverbal social communication, social acceptance, classroom behaviors, and social relationships.

Verbal and Nonverbal Social Communication

Communication skills are an important part of building and sustaining relationships. A number of studies have looked at the ways that individuals with learning disabilities may struggle with verbal and nonverbal communication skills. Some of the communication challenges researched include choosing a topic, taking turns in speaking, requesting for something to be clarified, and being able to think about and discuss multiple points of view when talking with others (Bauminger & Edelstein, 2005; Bryan & Burstein, 2004; Bryan, 2005). Nonverbal communication skills may also be a challenge. Students with learning disabilities consistently perform poorer than comparison groups on being able to identify feelings, particularly complex emotions in others (Bauninger et al., 2005; Bender, 2004; Bryan & Burstein, 2004; Bryan, 2005; Cartledge, 2005; Elias,

2004). They may also struggle to understand the social cues of others (Bryan, 2005; Kavale and Mostert, 2004; Weiner, 2004).

Classroom Behaviors

Students with learning disabilities are consistently seen as more off task, more disruptive to the classroom, less able to engage in classroom discussions, more aggressive, seeking more attention and more emotionally immature (Bender, 2004; Bryan & Burstein, 2004; Vaughn & Haager, 1994). This may lead to lowered academic expectations for student achievement and issues with social relationships with peers.

Social Acceptance

Typically, students with learning disabilities are less likely to receive social acceptance from their peers (Bauninger et al., 2005; Bryan, 2005; Weiner, 2004). This appears to begin even in kindergarten (Bryan & Burstein, 2004). In a review of past studies on this issue, Vaughn and Haager found that peer ratings of students with learning disabilities consistently are lower than for students who do not have a learning disability (1994). It seems that students with learning disabilities are somehow identified and are more likely to be rejected by their peers even before academic issues are raised.

Social Relationships

Studies that look broadly at social relationships for students with learning disabilities find that these students have fewer relationships or friendships with their peers (Berger, 2004; Bryan & Burstein, 2004; Geisthardt & Munsch, 1996; Kavale & Mostert, 2004; Vaughn & Haager, 1994; Weiner, 2004). In many ways, this is a measurement of the global impact of the various social skill issues that students with learning disabilities may face. Struggles with understanding what other people mean and

feel, conversation deficits, negative classroom behaviors and lower acceptance by peers leads to fewer friendships. This may also lead to academic impacts, as "peer relationships impact academic plans as peer attachment becomes more critical to the self-image of vocational and educational outcomes" (O'Koon, 1997, p. 473).

Family Issues

Disability does not just impact the individual with a diagnosis, it impacts the entire family. Concurrently, the way that families deal with or adjust to having a member with a disability can affect the success of that member with a disability. There have been a number of studies looking the impact of a child with a learning disability on the family, and a number of issues have been raised. First, parents' levels of stress are higher when they have a child with a learning disability, although this does not have a resultant higher level of family dysfunction (Dyson, 1996; Morrison & Cosden, 1997). Siblings of children with disabilities report having more rigidly defined roles, but do not report lower self-concept or self esteem (Dyson, 1996). Dyson also found that families focused more on the personal growth of the child with a learning disability (1996). Therefore, although there may be differences in family roles and stress level, research has not shown these things to correlate with family problems. Finally, initial research has shown that there a strong family association of reading disabilities within siblings, and from parents to siblings, which means that there is a significant chance that there are multiple family members with learning disabilities (Del-Homme, Kim, Low, Yang & Smalley, 2007).

The family's impact on the child with a learning disability, however, may be stronger. Research finds that parents have lower academic and career expectations of children with learning disabilities (Bender, 2004; Newman, 2005). Parents may also

have lowered expectations of these children's behaviors (Bender, 2004). Parents also tend to be more directive with children with learning disabilities (Bender, 2004). The adolescent may take longer to establish an "adult relationship" with his or her parents (Cosden, 2001; Yehahey & Mestanova, n.d.). Finally, parents may be more involved in making decisions for the child at school and may not give the adolescent with a learning disability as much responsibility for his or her own learning (Brinkerhoff, 1996; Field & Hoffman, 1997; Field & Sarver, 2003; Yehahey & Mestanova, n.d.).

Psychosocial Issues

Adjustment to a Disability

In addition to some of the specific issues students with learning disabilities may face, there are issues that all persons with disabilities may encounter. First, most individuals with a disability go through stages, or a process of coming to terms with, adjusting to, or accepting the disability. Livneh describes these stages as initial impact, defense mobilization, initialization, realization, and integration (Stewart, 1999). Another model, more specific to individuals with learning disabilities, includes awareness of "difference", the labeling event, understanding and negotiating the label, compartmentalization, and transformation (Higgins & Raskind, 2002). In both of these models, it is not until the later stages of acceptance/ adjustment that the individual with a disability may feel comfortable with taking "ownership" of his or her diagnosis, recognize the individual strengths he or she has, and find the positive aspects of living with a disability (Higgins & Raskind, 2002; Stewart, 1999). A number of studies have shown that students who have a better understanding of their learning disability have a more positive outlook on their lives, can compartmentalize the effects of their disability rather than perceiving it globally, and have higher success in school and later careers (Cosden & Eliott, 1999; Field, 1996; Goldberg et al., 2003; Skinner & Lindstrom, 2003).

However, it appears that many adolescents and young adults with learning disabilities have a minimal understanding of their disability. Although IDEA mandates student involvement in the Individualized Education Plan (IEP), which is the contract for educational supports and services between the student and the school district, and the transition planning process, many adolescents with learning disabilities are either minimally involved or not present at their IEP or transition-related meetings (Grigal, Test, Beattie & Wood, 1997; Hitchings et al., 2001; Mason & Field 2004). In a nationwide study of students who had left or finished high school over the previous two years, had an IEP in high school, and were now in college, 52.4% of them stated they did not even see themselves as having a disability (Newman, 2005).

Secondary Mood and Substance Use Disorders

Studies have also looked at the incidence of mood disorders, particularly depression and anxiety disorders. Several studies found a higher incidence of feelings of depression and anxiety amongst students with learning disabilities (Bender, 2004; Bryan et al., 2004; Dyson, 1996; Larkin & Ellis, 1998; Morrison & Cosden, 1997). Past research has also found a higher incidence of substance abuse disorders, although the rates of substance use are not higher (Beitchman et al., 2001; Bender, 2004; Cosden, 2001; Weinberg, 2001). Most research ties the increase in mood, anxiety and substance use disorders to issues such as potential co-occurring disorders, social skills issues, increased psychosocial stressors, and social stigma of having a learning disability, rather than being primary characteristics of learning disabilities (Weinberg, 2001).

Social Stigma

Another issue adolescents with disabilities may face is the stigma and negative stereotypes of being an individual with a disability. Individuals with disabilities experience stigma and stereotypes from the media, from popular culture, from teachers, family, and friends (Hahn, 1999). Even though a learning disability may be considered an "invisible" disability, persons with this diagnosis still will hear and experience prejudice and stereotypes about learning disability (McDonald, Keys, & Balcazar, 2007). Teachers and families may have lower expectations of them because of their diagnosis (Newman, 2003). They may experience taunting, bullying and ridicule at school (Baumeister, Storch & Geffken, 2008; Hahn, 1999; Higgins & Raskind, 2002, Vash & Crewe, 2004). Instructors may be unwilling to provide accommodations (Beilke & Yssel, 1999; Frymier & Wanzer, 2003). This pressure may lead to the individual "internalizing" these negative attitudes, believing that the negative things that are said and the lowered expectations are all that he or she deserves.

The other outcome from the social stigma may lead to adolescents to attempt to hide their learning disability, particularly after they leave high school. For example, the majority of individuals with learning disabilities that received special education services and supports in high school will not use academic supports in college (Hartman-Hall & Haaga, 2002; Wagner et al., 2005). Adults with learning disabilities may decide not to disclose their disability status for fear of losing their job or being treated negatively (Greenbaum, Graham & Scales, 1996).

Self-concept

A number of studies have looked at overall self-concept, which is "the view one has of oneself, either overall or in relation to a particular situation or setting" (Bender, 2004, p. 110), and it can be looked at from a general self-concept or from a specific issue. Typically, students with learning disabilities may not express a lowered general selfconcept, but they do express a lower self-concept in the areas of academics and other school specific behaviors (Bender, 2004; Bryan et al., 2004; Cosden & McNamara, 1997; Ferri, Gregg, & Heggoby, 1997; Geisthardt & Munsch, 1996; Hargman-Hall & Haaga, 2002; Raines, 2006).

Locus of Control

Many studies have looked at the issue of locus of control, or "one's perception of control over one's environment" (Bender, 2004, p. 111). Persons with an internal locus of control have a high sense of being able to change their environment, while persons with an external locus of control tend to believe that the have little determination over their fate. Researchers looking at locus of control find that students with learning disabilities tend to express an external locus of control (Bender, 2004; Bryan et al., 2004; Kavale & Mostert, 2004). This may lead to students being less likely to advocate for themselves, or to experience feelings of helplessness or incompetence.

Self-efficacy

Self-efficacy, according to Bandura, is composed of "...people's judgment about their capabilities to organize and execute courses of action required to attain designated types of performances." (1986, p.391.) Self-efficacy beliefs link strongly to a number of academic and vocational outcomes (Nauta, Kahn, Angell & Cantarelli, 2002). Some work

has found that, in the areas of academic and social self-efficacy measures, students with learning disabilities rate their self-efficacy lower (Lackeye, Margalit, Ziv & Ziman, 2006). In his review of self-efficacy studies and individuals with learning disabilities, Klassen found that students with learning disabilities may or may not, depending on the particular area studied, have a different level of self-efficacy than individuals without a learning disability. What the studies found, however, was that students with learning disabilities may overestimate or miscalibrate their abilities, particularly in the areas of reading and writing (2002). This may be due to their maturity levels, or because they have not been given enough information to be able to make a more accurate statement of their achievement abilities (Klassen, 2002).

Self-determination

Self determination is a key skill that incorporates self-awareness, ability to make decisions about the future, setting and reaching goals, and evaluating their actions and adjusting plans if needed (Algozzine, Browder, Karvonen, Test, & Wood, 2001; Field, 1996; Wehmeyer & Field 2004). Field discusses a number of barriers that adolescents and young adults with learning disabilities have to self-determination, which include: (a) a lack of self-awareness of or a disavowal of their disability will make it hard to have a sense of possibilities (b) a history of having other people make decisions for the individual may lead to learned helplessness (Seligman, 1975); (c) cognitive challenges in the areas of making plans and initiating behaviors may make it difficult to carry out selfdetermination (1996).

The need for self-determination skills is very clear in the process of transitioning to college for all adolescents, and in particular for adolescents with disabilities. In the

postsecondary environment, a student with a disability must be able to identify themselves as a person with a disability, provide any required documentation to verify that disability, know enough about his or her particular learning needs to ask for the right accommodations, advocate for the right accommodations, and be able to request these accommodations from each instructor and possibly from peers (Babbit & White, 2002; Brinkerhoff, 1996; Gil, 2007; Skinner & Lindstrom, 2003). This is a big jump for an adolescent who, in the secondary setting, may have only minimally participated in his or her IEP and may never have had a discussion about his or her disability. Family may have done all of the advocating for him or her over the years. Now, the college environment wants to talk directly to the student, not the parent (Janiga & Costenbader, 2002).

Summary of Issues from a Social Work Perspective

Students with learning disabilities, by definition, will struggle with some aspect of knowledge acquisition. A number of other potential affects have also been discussed in the literature, but it is unclear what the origins of these other potential secondary characteristics of learning disability are. More specifically, how do the specific neurological impairments an individual with learning disability has interact with that individual's ecosystems?

A number of researchers would argue that many of the secondary symptoms of learning disability result the primary neurological language and cognitive impairments of the individual. Many researchers in the field of learning disability discuss how neurological impairments may affect social skills (e.g., Bauninger et al, 2005.; Bryan, 2005; Court & Giron, 2003; Elias, 2004). In these models, then, these primary symptoms

of learning disability will then lead to various other issues such as difficulties with peer relationships, self-esteem issues, and other mood issues (Weiner, 2004).

As the model of disability theory has moved from a medical, or deficit based, model of disability, to a model that looks at the ways that disability has been socially constructed, so has the area of learning disability begun to broaden the focus from the ways that the neurological impairments lead an individual to have a disability, to how the social system constructs an environment where the individual becomes "disabled". Reid and Valle, for example, argue that the concept of learning disabilities has social and cultural underpinnings, and that it is a socially designed concept that pathologizes students who are struggling in socially constructed school system (2004). They also argue that individualizing these issues takes away from the systemic issues that isolate and underpriviledge a number of student groups, including ethnic and racial minorities, as well as individual who learn in ways that are not "normative" (Reid & Valle, 2004). The impacts of being labeled with a disability may lead to individuals, their families and their support systems to have lowered expectations on a variety of levels, which may impact self-efficacy and self-determination, and finally their goals and outcomes (Dudley-Marling, 2004; Hahn, 1999; McDonald, Keys & Balcazar, 2007; Reid & Valle, 2004; Vash & Crewe, 2004). From this perspective, therefore, many of the secondary effects of learning disabilities are based on the impacts of being labeled as having a disability within the school system and within the individuals' environment.

Another area of current research regarding the secondary impacts of learning disability that extends the social constructionist approach to disability comes from risk and resilience research (Margalit, 2004; Weinberg, 2001; Weiner, 2003). The basis of this

research is that the secondary characteristics of learning disabilities, such as social skills deficits, mood and substance disorders, are not due to the individual's impairment, but that having a learning disability may lead to increased risk for these other disorders. As Weiner states, "Risk and resilience models highlight the fact that merely examining factors intrinsic to the individual with LD provides an incomplete understanding of their functioning" (p. 78). Some of the potential risk factors identified are cultural attitudes towards disability, various secondary diagnoses, particularly behavioral disorders such as Attention Deficit Hyperactivity Disorder and Conduct Disorder, levels of stress and tension, and a lack of understanding of disability (Kalyanpur & Harry, 2004; Morrison & Cosden, 1997; Weinberg, 2001; Weiner, 2003). Some protective factors or areas that might affect resilience include positive classroom environments, parental adjustment and acceptance of disability, self-awareness and understanding of the disability, and engagement in academics (Margalit, 2004; Morrison & Cosden, 1997).

From a social work perspective, there is something to be learned from all of these arguments. It is possible to see these perspectives as interactive, rather than at diametric poles. It appears that there are sets of neurological deficits that lead to language and learning deficits, which, like all other human characteristics, fall on a continuum. The particular point by which these learning differences lead to a diagnosis of a disability is based on social and political constructions of disability, as well as current research in the field of learning disabilities. Since the inception of the diagnosis, there has been increasing consensus regarding the symptoms of and assessment procedures for learning disabilities. Research on learning disabilities identifies a number of primary and secondary issues that affect a large proportion of people with a learning disability

diagnosis. Each individual with a learning disability will have some or all of these primary and secondary issues based on the particular biopsychosocial factors influencing that individual (Raines, 1989). Social work interventions, therefore, should focus on all aspects of the client system, rather than just on the individual with a learning disability, and should focus on systems change, empowerment, and strengths based approaches, as is the focus of social work practice with other marginalized populations (Beaulaurier & Taylor, 2001; Gilson & DePoy, 2002; Mackelprang & Salsgiver, 1996, 1999).

Interventions for Adolescents with Learning Disabilities

Again, the impact of the learning disability differs for each person, but the overall impact of these issues becomes evident when looking at postsecondary educational and vocational outcomes, with lower enrollment and completion of postsecondary education and taking on lower wage jobs with less benefits as discussed previously. Many of the primary and secondary symptoms or issues related to learning disabilities may impact postsecondary educational and vocational outcomes. The impacts of lowered or miscalibrated self-efficacy, and lower academic self-concept, may lead to students either believing that they will not be able to manage the academics of postsecondary education, or to aim for academic programs they may be inadequately prepared for. Students without strong self-determination skills and may not be prepared for the skills that are expected in postsecondary environments: high levels of autonomy in determining class enrollment and class work completion; seeking out, advocating for, and requesting supports and services for specific learning needs; making strong social support networks as an independent adult; organizing their schedule and managing time commitments (Brinkerhoff, 1996; Field & Hoffman, 2003). Social skills deficits may also impact the

transition to independent, mature relationships in postsecondary education and vocational environments.

However, a number of types of interventions within the school system are discussed in the literature as having promise for success. The major interventions focus on (a) creating educational environments to support positive post high school educational and vocational outcomes, (b) providing social skills training, (c) providing training in increasing self-determination practices and (d) providing appropriate transition services. These will be reviewed briefly, with a focus on how social workers can incorporate these practices in their own work with adolescents with learning disabilities.

Creating School Environments for Positive Vocational and Educational Outcomes

Students with learning disabilities are less likely then the general population to complete high school, and significantly less likely to go on to post high school educational or vocational programs (Blackorby and Wagner, 1995; McAllister, 2008; Murray, Goldstein, Nourse & Edgar, 2000 Sitlington & Frank, 1990; Rojewski, 1999; Wagner et al., 1991; Wagner et al., 2005). One way to advocate for students with learning disabilities is to support practices that lead to the inclusion of students with learning disabilities in the general education program, particularly programs that are preparing students for college. These experiences give students with learning disabilities more time with peers and to work on some of the academic and social issues the student will face in a postsecondary environment within the relative safety of secondary school. Students with learning disabilities are increasingly being supported and included in general education (McLeskey, Henry, & Axelrod, 1999; Wagner et al., 2003; Wehmeyer & Field, 2004). IDEA 1997 and 2004 both have reiterated the commitment to the least restrictive

environment (LRE) and the idea that students with disabilities should be in the general education curriculum as much as possible (IDEA, 2004). Social workers in the school setting should work to advocate for their students to remain in the general education setting as much as possible by providing support and suggestions to general education teachers as needed, working on behavior plans for students who are struggling to behave in the general education classroom, and advocating in IEP meetings for LRE.

Students with learning disabilities are as likely to work after leaving high school as are students without a diagnosed disability, although they are working in lower paying jobs (Murray et al., 2000; Rojewski, 1999; Sitlington & Frank, 1990; Wagner et al., 2005). Another way to support students with learning disabilities discussed in the literature is to advocate for vocational oriented high school programs, particularly those with the opportunity for paid work experiences (Benz, Lindstrom, & Yovanoff, 2000; Evers, 1996; Griffith & Wade, 2001; Wagner, Newman & Cameto, 2005). These programs, while providing important vocational training and preparation, have not been shown to negatively impact students' ability to enter and succeed in postsecondary education (Benz, Lindsrom & Yovanoff, 2000; Griffith & Wade, 2001). Although social workers may not be directly involved in vocational training, they should be aware of the importance of vocationally oriented education, and be ready to advocate for vocational experiences for adolescents with learning disabilities.

Social Skills Training

The largest area of treatment explored for students with learning disabilities is in the area of social skills. There are a large number of social skills training programs that have been developed for use inside and outside of the classroom. The skills taught may

include goal setting, working cooperatively, asking for help, and decision making (Bender, 2004; Bryan et al., 2004; Cartledge, 2005; Elias, 2004; Kavale & Mostert, 2004).

Evaluation on these methods has shown only mild to moderate improvements in social skills (Kavale & Mostert, 2004). Studies report that there are higher benefits to doing this kind of training within the classroom environment, by the teacher, on an ongoing basis, rather than having students have a separate social skills group, and should be individualized to the particular environment (Bryan et al., 2004; Cartledge, 2005; Elias, 2004). Because many of these training methods are relatively new, it may still be several years before any long-term benefit can be seen. However, social skills and other types of self-help groups are common types of interventions for many student concerns, and are an area of practice that is common for school social workers (Garrett, 2005; Mishna & Muskat, 2004 Raines, 2006), so it may be a natural extension of this type of work for social workers to work with adolescents with learning disabilities on social skills within group formats.

Social workers should also be prepared to assess adolescents with learning disabilities in the area of social skills. In his overview of evidence-based practices for individuals with learning disabilities, Raines reports that the only screening measure that has shown promise for adequately being able to measure social skills deficits is the Social Skills Rating System (SSRS), which is geared towards individuals in grades 3-12 (2006). He recommends that workers who do not have this measurement available ask the student sets of scaled questions regarding various areas of potential social skills issues, or to rank order various social skills in terms of how easy or difficult they are for the student (Raines, 2006). He also recommends gathering data from the student's teachers, family,

and peers in addition to assessing the student with a learning disability, as each group will have a different perspective on the social skills strengths and areas of concern for the student (Raines, 2006).

Self-Determination Training

Another area of significant intervention is in the area of self-determination and self-advocacy. This is a natural extension of social work's core values (NASW, 1999). A number of self-determination programs and projects have taken place focusing on children and adolescents with learning disabilities. Many of these intervention strategies involve providing training to the individual about their learning disability, to identify their goals, and to set action plans towards these goals (Field, 1996). Most of these selfdetermination strategies have focused on assisting students to become active participants in their IEP process (Field, 1996; Field, Sarver & Shaw, 2003). What has been found is that higher levels of participation in IEP's, particularly when students are able to set goals and plan for achievement of goals, leads to higher rates of high school completion and postsecondary educational participation (Field et al., 2003; Griffith & Wade, 2001; Mason, Field, & Sawilowsky, 2004; Weymeyer & Field, 2004). This is particularly important during transition planning, which begins at the age of 14 and continues as long as the individual with a disability is within the public school system. Adolescents with learning disabilities, if possible, should take over the responsibility of making academic decisions, running IEP meetings, and settings goals and plans during secondary school (Babbit & White, 2002; Brinkerhoff, Sarver & Shaw, 2002; Mahoney-Kuba, n.d.; Skinner & Lindstrom, 2003). By beginning the process of taking responsibility in the secondary environment, the IEP team is giving the adolescent an environment to try out

the behaviors he or she will need to know to be successful in a postsecondary environment.

Social workers can be an important component of both teaching selfdetermination strategies. Similarly to social skills groups, a number of training programs designed for adolescents with learning disabilities that have shown effectiveness in increasing self-determination are available. The Steps to Self-Determination curriculum by Field and Hoffman, the Choicemaker Self-Determination Transition Curriculum, and the IPLAN Curriculum have all been shown in previous research to make positive changes in student's ability to engage in self-determination practices (Field, 1996). Field also recommends role modeling, providing opportunities for students to make decisions for themselves, attribution retraining and cognitive behavioral strategies to improve students' self-determination skills. Social workers should also for advocating for selfdetermination practices within the educational system, particularly in the area of IEP and transition planning participation (Beaulaurier & Taylor, 2001; Gilson & DePoy, 2002).

Conclusion

Although it is clear that many of these techniques can be and already are utilized by school social workers, social workers in other areas of practice with adolescents should also be prepared to support positive transitions out of the school environment. One part of that preparation is being aware if adolescents that the social worker is currently engaged with have learning disabilities. Adolescents receiving mental health, child welfare, substance abuse, forensic, medical or other types of social work interventions should be assessed for the presence of impairments such as learning disabilities. This may be as simple as asking the client and his/her family if he/she has ever been diagnosed

with a learning disability. Even if the social worker is not familiar with the particular assessment techniques for learning disability, he/she can assess for the potential impacts the adolescent identified with a learning disability might be experiencing. The social worker may also determine that goals such as increased social skills or self-determination skills are appropriate to focus on in their work with adolescents with learning disabilities and their families, depending on the nature and scope of the relationship with the client.

It is also important that social workers in all settings be prepared to assess the potential psychosocial impacts of having a learning disability and work with the client to understand the impact of disability discrimination and acceptance of disability on the individual and his/ her systems (Beaulaurier & Taylor, 2001; Gilson & DePoy, 2002; Mackelprang & Salsgiver, 1996, 1999). Social workers should be prepared to explore with the adolescent and his or her family their understanding of learning disabilities in general, and the way that having a learning disability has impacted him or her. It is also important to enable the adolescent and his or her family to view and enhance the strengths and skills the adolescent possesses. Referrals to agencies such as Centers for Independent Living or learning disability advocacy groups may be appropriate for individuals wanting to connect with other individuals with disabilities. A number of learning disability advocacy resources are now available on-line (Murray, Goldstein, Nourse, & Edgar, 2000).

Finally, social work educators should become more aware of the ways that college students with learning disabilities can be supported within the classroom and field placements. Building strong relationships with the college or university's resource center or advocate for persons with disabilities is important to support the enrollment and

success of college students with learning disabilities in Bachelor's, Master's, and Ph.D. programs in social work. Social work faculty should also seek out education on the various accommodation strategies that are often requested and used by individuals with learning disabilities. Integrating content about practice with individuals with disabilities can be done in almost all areas of social work class content. A number of lesson suggestions and plans, course syllabi for required and elective courses with disability content, and textbooks on social work practice with persons with disabilities are available (Gilson & DePoy, 2002; Gilson, MacDuffie & Meyershon, 2002; Liese, Clevenger, & Hanley, 1999; Mackelprang & Salsgiver, 1996, 1999; Rothman, 2003).

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CHAPTER THREE

Utilization of the National Longitudinal Survey of Youth to Study Postsecondary Outcomes for Adolescents with Learning Disabilities: Preliminary Findings

Abstract

This study examined demographic, economic, educational, and other relevant variables from the National Longitudinal Survey of Youth, 1997 cohort.. Tests were also performed to determine the ways in which the sample of individuals with learning disabilities were similar or different from persons with other impairments and persons with no identified impairment. Findings showed that the educational and income outcomes that have been seen in previous research after one to three years of leaving high school continue as students are three to seven years post high school. Implications and directions for future research are discussed.

Introduction

Individuals with learning disabilities (also called specific learning disabilities) comprise one of the largest groups of individuals with disabilities. The U.S. Department of Education estimates that approximately half of all children with disabilities in public school have a learning disability ("Children with Disabilities", 2007). Although there are no statistics on the numbers of adults with learning disabilities, it is clear from research that this is a diagnosis with lifelong implications, so it is likely that the prevalence of the diagnosis remains fairly stable (Goldberg, Higgins, Raskind & Herman, 2003;

Hollenbeck, 2007; NRCLD, 2007). Boys tend to be diagnosed with learning disabilities more often and earlier in their academic careers (Bloom & Day, 2006; "Children with Disabilities", 2007; Wagner, Newman & Cameto, 2004). Individuals with diagnoses of learning disabilities, by definition, have near typical to above typical intelligence, but have difficulties with one or more areas of academics (IDEA, 2004).

This diagnosis, although primarily focused on the acquisition and performance of academic tasks, has a number of other potential implications for the individual. Children and adults with learning disabilities may struggle with: (a) social skills issues (e.g., Bauninger Edelstein, & Morash, 2005; Cartledge, 2005; Elias, 2004; Goldberg et al., 2003; Kavale & Forness, 1996; Weiner, 2003); (b) with self-concept and self-esteem (e.g., Bryan, 2005; Cosden & Eliott 1999; Elias, 2004; Weiner, 2003); (c) with mental health and substance abuse issues (e.g., Beichtman, Wilson, Douglas & Adlaf; 2001; Bryan, 2005; Cosden, 2001; Morrison & Cosden, 1997; Hoy et al., 1997); and (d) with self-efficacy and self-determination (e.g., Brinkerhoff, 1996; Field, 1996; Field & Hoffman, 1997; Lackeye, Margalit, Ziv & Ziman, 2006). Beyond this set of psychosocial issues, there are possible impacts regarding completing high school, going on to postsecondary education or training, and working.

In 2001, the Cooperative Institutional Research Program, a survey of freshman in four-year colleges, found that 2.4% of college freshman identified as having a learning disability. This is approximately 40% of all students with disabilities entering four-year programs, and up significantly from the 1.0% of students who identified as having a learning disability in 1988 (Henderson, 2001). This is significantly lower, however, then the approximately 6% of students identified as having a learning disability in the public

school system ("Children with Disabilities", 2007). A number of studies have attempted to monitor and understand the outcomes for students with learning disabilities as they leave high school, particularly in the areas of postsecondary education, vocational training, and employment. Although much can be learned from prior work, to this point, the research, by and large, has looked either at particular subgroups of individuals with learning disabilities or has not followed students with learning disabilities for more than a few years after they leave the public school system. Therefore, we have some estimates, for example, of the types of exits students with learning disabilities take from the public school system, how many students with learning disabilities who enter a postsecondary institution will finish that program, and how many students with learning disabilities will begin postsecondary education within the first year or two of leaving the public school system. A few small studies have looked at the long-term outcomes for individuals with learning disabilities (e.g. Goldberg, Higgins, Raskind & Herman, 2003; Wong, 2003) but much of that research has focused on particular student populations.

Review of Previous Published Research Since 1990

National Longitudinal Transition Studies

The first major study looking at educational and vocational outcomes for students with disabilities published since the early 1990's is the National Longitudinal Transition Study. Beginning in 1987, and ending in 1993, this study looked at a nationwide sample of over 8,000 students with disabilities. Starting with a sample of students between the ages of 13 and 18, the study followed these individuals through annual interviews with the student and/or the parent. Areas covered included experiences in secondary school, graduation rates, independent living measures, risk behaviors, employment and

postsecondary education ("NLTS Sample", n.d.). In a paper published in 1996, Blackorby and Wagner reported the educational and vocational outcomes for students with disabilities in general. In terms of individuals with learning disabilities, they found that this group was employed at rates comparable to the general population of persons without disabilities, but were entering and completing postsecondary education at much lower rates. Specifically, two years after high school, 13.9% of students with learning disabilities had entered postsecondary education, which increased to 30.5% after three to five years out. In comparison, 53% of the general population had entered postsecondary education two years out of high school, increasing to 68% after three to five years out (Blackorby & Wagner, 1996).

The follow up study to this one, the NLTS-2, began with a sample of 12,000 students with disabilities ages 13-16 in 2000, and plans to follow these students for 10 years ("NLTS-2 FAQ", n.d.). The first report regarding postsecondary experiences, published in 2005, found that, for students with learning disabilities, 75% of the sample left high school with a diploma. Approximately one third of students with learning disabilities had taken some postsecondary education after leaving high school, with 21.5% going to community college, 9.7% going to a four-year school, and 5% going to a vocational/ technical school. Almost 75% of this group was working at least part time (Wagner, Newman, Cameto, Garza & Levine, 2005).

Educational outcomes of students with learning disabilities from the state of Iowa

In 1990, Sitlington and Frank sampled 911 individuals with learning disabilities in the state of Iowa one year after they graduated from high school. Although 77% of the sample was working, almost two thirds of those working were in low-status jobs, and

men were making over one dollar per hour more than women. In addition, of the almost 30% who had begun a postsecondary program, only 6% were still in that program one year after high school graduation. The majority of students who had any postsecondary education were at a two year college (Sitlington & Frank, 1990).

National Educational Longitudinal Study

Rojewski utilized the National Educational Longitudinal Study to look at the educational and vocational outcomes and aspirations of students with learning disabilities two years after leaving high school. He found that graduation rates and rates of employment were significantly lower for females than males with learning disabilities. Men and women with learning disabilities were more likely to be working only and much less likely to be in postsecondary education than individuals without a learning disability. Both men and women with learning disabilities were aspiring to lower prestige careers than their counterparts without a learning disability (Rojewski, 1999).

Outcomes of individuals who are gifted and have learning disabilities

Holliday, Koller and Thomas (1999) looked at 80 individuals with learning disabilities who had a Full-Scale IQ score of over 120 and were receiving Vocational Rehabilitation services. They found that only 21% of the sample had completed four or more semesters of college, but almost half of the sample was interested in a college degree. Their findings suggested that these individuals were accomplishing educational goals at a similar rate to other individuals with learning disabilities (Holliday, Koller & Thomas, 1999).

Outcomes of high school graduates in 1985 and 1990 with learning disabilities

Murray, Goldstein, Nourse & Edgar (2000) studied the educational status of 1985 and 1990 high school graduates from three high schools between 1991 and 1996 on an annual basis. They found that, overall, students with learning disabilities were much less likely to enroll in or graduate from any postsecondary program, and the rates of postsecondary enrollment for individuals with learning disabilities did not increase significantly over time. The postsecondary graduation rates for individuals with learning disabilities were approximately 19% at five years and 43% at ten years, compared to 35% at five years and 55% at ten years for individuals without a learning disability. The most striking difference is in graduation rates from four-year colleges. At ten years, 2.4% of individuals with learning disabilities had graduated from a four-year college compared to 45.5% of individuals without a learning disability (Murray, Goldstein, Nourse & Edgar, 2000).

Summary of Findings

Overall, the studies looking at post high school outcomes for individuals with learning disabilities have similar findings. Most have found employment rates that are similar to individuals without a learning disability, and that women are working less and for less pay than men. Although students with learning disabilities can be found at all levels of education, they are typically less likely to graduate from high school, more likely to enter vocational or two-year college programs, far less likely to enter a four-year college program, and less likely to complete postsecondary education then their peers who do not have learning disabilities. Almost all studies found that about one third of individuals with learning disabilities graduating from high school will enter

postsecondary education, but the graduation rates of individuals with learning disabilities are significantly lower than that, particularly at four-year institutions.

Only two of the previous studies followed students for longer than two years after leaving high school. The only published study that looked at graduates over five years after completion of high school looked at high school graduates from 1985. Since that time, a number of significant changes have been made in Special Education services, most specifically, a significant focus on transition planning and preparation. Since 1997, all students receiving Special Education services are required to have an annual Individual Transition Plan beginning at age 16, with the intent of having a team of individuals to work with the individual with a disability to ensure that their post high school goals can be met (IDEA, 2004). In addition, there has been a movement towards integration of all individuals with disabilities into the Least Restrictive Environment and into more academically challenging coursework (IDEA, 2004; McLeskey, Henry, & Axelrod, 1999; Wagner et al., 2003; Wehmeyer & Field, 2004). Theoretically, then, students with learning disabilities should be much more prepared for postsecondary education and training programs. The transition plan should provide the student and his/ her support network with the opportunity to make plans towards postsecondary education and/ or vocational goals. Inclusion in general education classes may provide the academic challenge and rigor that is more similar to that of a postsecondary educational environment, and thus better prepare students and increase their chances for success (Brinkerhoff, 1996; Wehmeyer & Field, 2004).

Research Questions

This study, although with a still relatively young population of individuals with learning disabilities, will begin to look at some of the more long-term outcomes for this population. Utilizing the National Longitudinal Survey of Youth, 1997 cohort, the following questions will be explored:

- 1. What are the demographic, educational, vocational, and mental health status data for individuals with learning disabilities (LD), individuals with another identified impairment (OI), and individuals without an identified impairment (NI)?
- 2. Are these identified variables similar or different between these three groups?
- 3. Are the educational achievement levels and income for these three groups a function of the participant age?

Method

Study Population

In order to answer these questions using a large, representative sample of adolescents leaving the K-12 system and entering into various post high school outcomes, one of the samples of the National Longitudinal Surveys (NLS) was chosen. The NLS are a series of longitudinal panel surveys sponsored by the Bureau of Labor Statistics to "gather information at multiple points in time on the labor market experiences of six groups of men and women" (2003, p. 1). These surveys began in 1966, and were intended to be representative of all persons living in the U.S. at the time the particular sample was drawn. These surveys have included studies of older men, mature women, young men, young women, young mothers (NLSY79), youth (NLSY79 children and NLSY79 young

adults), and most recently adolescents and young adults transitioning out of the K-12 system (NLSY 97) (Bureau of Labor Statistics, 2003).

The National Longitudinal Survey of Youth, 1997 (NLSY97) was chosen because of the relative recency of the survey, the sample size, the ability to gather a sample of adolescents with learning issues, and the types of questions asked of the participants. NLSY97 is a longitudinal panel study of young people with beginning ages of 12-16 as of 12/31/96 (born between 1980 and 1984). The researchers gathered the initial sample by screening 75,291 houses within 147 nonoverlapping primary sampling units ("NLSY97 User's Guide", 2007). Interviewers requested that, within the identified homes, all household residents born between 1980 and 1984 participate in the sample. This led to 8,984 participants within 6,819 households ("NLSY 97 Users Guide", 2003). Of this sample, there is both a cross-sectional sample of the US population (6,748 initial participants) as well as an oversample of Hispanic and black individuals (2,236 initial participants) (Center for Human Resource Research, 2003). Data have been collected on the survey participants on an annual basis. Currently, the retention rate for NLSY 97 is 81.7 for Round Nine ("NLSY97 User's Guide", 2007).

The NLSY 97 survey began with an interview of the primary guardian of the participant and a separate interview with the participant. After the initial year, the participant was the only person interviewed. In addition, a number of other data sources were used. Students were given the Armed Services Vocational Aptitude Battery (ASVAB) test and career inventories and the Peabody Individual Achievement Test Math Assessment. Finally, participant's schools were asked for final high school transcripts.
The content of the survey can be broken down into ten sections. The majority of these data were gathered by participant interview, although some data were gathered by the aforementioned methods as well. The first content area is about employment to learn what types of jobs, how much money and how often the participants are working. Second is a section on education, which includes enrollment status at the K-12 or postsecondary grade level, number and types of courses taken, GPA, sources and types of financial aid, status, and emphasis in school. Third, there is a section regarding participation in training programs. Fourth, there is a section on the income of the participant and the household, assets, and participation in any government programs. The fifth section is about family formation, including relationships, partnerships/ marriages, children, and child care. Sixth, there is a section about the background of the participant's parents, including family system, work history, income, level of education, health status, relationship status, and other demographic information. Seventh, the expectations for the participant and goals for the participant were assessed. Eighth, participants were asked about their attitudes, including relationships with parents, relationships with peers, peer activity, religion, perceptions of school environment, risk behaviors, and time management. Ninth, participants were asked about their health status. Tenth, participants were asked about environmental variables, such as the urbanicity of the residence or the unemployment rate of the local labor market ("NLSY97 User's Guide", 2007).

Identification of the Sample

In order to analyze the data, three subsets of the sample were created in order to be able to compare the participants with an identified learning disability with persons with another identified physical, behavioral or emotional impairment and to persons with

no identified impairments. The first subset, which is the sample of participants labeled as having a learning disability (LD), was identified with a question asked of the participant's parent or guardian at the time of the first interview. Specifically, the participant's parent or guardian was asked if the participant had a learning disability such as dyslexia or attention disorder, after stating "yes" to a question of whether or not the student had a learning or emotional problem that limits the participant's school or work performance ("NLSY Parent Questionnaire", 1997). This particular question was used because there was no other question asked regarding learning disability asked of the entire sample at any other time. This led to a sample of 623 individuals, which is 6.9% of the total sample. Limitations of this identification method are discussed in the limitations section of the paper.

The second subset consists of participants who were identified as having any other physical, behavioral or emotional impairment and are labeled as Other Impairment (OI). This was calculated by combining the yes responses to three impairment related questions that were asked of the participant's parent or guardian in the first interview ("NLSY Parent Questionnaire", 1997). This led to a sample of 1,974 individuals, which is 22.0% of the total sample. It is important to clarify that some of the individuals in the LD group may have other physical, emotional, or behavioral co-occurring impairments, but the OI group does not have any individuals identified by the parent or guardian as having a learning disability such as dyslexia or attention disorder. The third subset of the sample, identified as No Impairment (NI) consists all of the other participants of the study, and is the group of individuals who did not have a parent or guardian identify that the participant had any type of physical, behavioral, or emotional impairment.

Learning disability identification is a problematic issue for all studies looking at this client population. As an "invisible" disability (McDonald, Keys & Balcazar, 2007), accurately identifying members of this population can be challenging. Studies may utilize self-report, parental report, teacher report, students identified through the participant's school district, review testing that was done of the participant to identify him or her with a learning disability, or finally to give tests for learning disabilities to all study participants. Each of these sampling methods has its own strengths and limitations. This issue is compounded by advancements in learning disability identification. Over the past decade, a move away from aptitude/ achievement measures being the primary method of identification to a Response to Intervention method (Hallahan & Mercer, 2001; NCRLD, 2007) further complicates the accurate identification of individuals with a learning disability.

Results

Variables

In order to answer the research questions, a number of demographic and outcome variables are examined, along with potential variables that have been identified as theoretically relevant to the population of individuals with learning disabilities. SPSS Version 15.0 for Windows (2006) was used to perform all statistical tests. First, descriptive statistics will be presented these variables. Next, information regarding the correlation of the income and educational levels of the participants in relation to the age of the participant will be provided to answer the second research question. The Type I error rate for rejection of these correlations of .05 was set. Finally, one-way ANOVAs will be run on the identified variables to determine if they are different between the LD

group, the NI group, and the OI group. Post-hoc tests (Tukey's test) on the ANOVAs were run, with a significance level of .02 to reduce the chance of Type I errors based on the multiple tests run (Howell, 2002). Tables 3.1 through 3.5 provide information regarding the demographic, educational, and employment related variables, Tables 3.6 and 3.7 provides the means and standard deviations of all of the variables examined, Tables 3.8 through 3.11 provides information regarding the one-way ANOVA's performed, and Table 3.12 provides information regarding the correlations between age and income and highest grade completed. Figures 1 through 3 provide information regarding the frequencies of the highest grade completed for each group.

Demographic Data

Sex

Table 3.1 illustrates that the sample consists of approximately equal numbers of males and females in the NI and OI groups. In the LD sample, however, approximately 68% of the sample is male and 32% is female. This gender disparity is a typical finding in this population. For example, the Child Trends Data Bank reports that, in 2004, 10% of boys and approximately 6% of girls had a learning disability ("Learning Disabilities", n.d.). Other researchers note that boys tend to be diagnosed earlier and more often than girls (Bloom & Day, 2006; "Children with Disabilities", 2007; Wagner, Newman & Cameto, 2004).

Racial/Ethnic Background

Because the NLSY 97 was designed to oversample for African American/Black and Hispanic/Latino populations, the proportions of individuals should not be compared to the general population without weighting the sample. NLSY97 created four racial/ ethnic categories for the study. These include Black/ African American, Hispanic/ Latino, Mixed Race/ Non Hispanic, and Non Hispanic/ Non Black, which includes all other racial/ ethnic groups in the study sample ("NLSY97 Codebook", 2007). The unweighted proportions of individuals, in each racial/ ethnic category identified by NLSY as shown in Table 3.1, can be compared between the three subsamples, however. The entire sample has a racial/ethnic breakdown that NLSY reports as the following: 51.9% Non Hispanic/ Non Black, 26.0% Black, 21.2% Hispanic, and 0.9% Mixed Race/ Non Hispanic. With that in mind, along with a comparison to the NI subsample, it appears that, for the LD subsample (and, to a lesser extent, the OI subsample), there is a disproportionately higher number of Non/Hispanic/ Non Black individuals, approximately proportionately the same numbers of Black and Mixed Race/ Non Hispanic individuals, and a disproportionately lower proportion of Hispanic individuals.

These findings go against the data issued by the U.S. Department of Education regarding racial/ ethnic status and Special Education status based on a learning disability. In 2004, Black/ African American students and Hispanic/ Latino students were more likely than Whites/ Caucasians to receive special education services based on a learning disability (KewelRamini, Gilbertson, Fox & Provasnik, 2007). However, other studies have found that Hispanic/ Latino communities are less likely to be identified with a learning disability, particularly when it is the families who are making the identification

(Cosden & Eliott, 1999; Kalyanpur & Harry, 2004). It is impossible to determine the reasons for this disproportionate finding in this sample. There may be cultural considerations regarding disability identification. In cultures that focus on the family as the primary unit of society, identifying a child as having a disability may reflect poorly on the family. It is possible that Hispanic/ Latino families are less open to identifying their children as having a disability based on the potentially negative impacts it will have on the family (Kalyanpour and Harry, 2004). Another consideration is the increased complexity of determining disability when there are both language and learning issues, as this sample is more likely to be engaged in English as a Second Language curriculum in school settings. A parent or guardian may identify their child's learning issues as being related to second language learning rather than a disability.

Age of Sample

The NLSY 97 was designed to sample equal proportions of adolescents ages 12 through 16 as of December 31, 1996. As is shown in Table 3.1, it appears that all three groups have fairly equal proportions of adolescents ages 12 through 16, although the group of individuals with learning disabilities appears to have slightly more younger and fewer older participants.

Vocational Data

Income earned by participant

Tables 3.2 and 3.5 provide information regarding income levels of participants. NLSY 97 surveys all of its participants annually regarding their salary for the previous year in a variety of categories. This data was combined to create a composite variable of all earned income. The most recent year there is a complete set of earned income is for

earnings in the year 2003. Data for this were collected in both 2004 and 2005. The data are presented in the categories designated by NLSY in Table 3.2. The categories for income are as follows: 1= \$1-,5000; 2= \$5,001-10,000; 3=\$10,001-25,000; 4=\$25,001-50,000; 5=\$50,001-100,000; 6=\$100,001-250,000; 7=\$250,000 + ("NLSY97 Codebook", 2007). The ANOVA statistic (Table 3.8) for this was significant (F [2,7608]=7.33, p=.001). Post-hoc tests show that the NI and OI groups have similar means, and the LD group has a significantly lower mean.

The biggest difference in income ranges appears to be in the area of no earned income. Referring to Table 3.2, 27.7% of the LD sample had not earned any income in 2003, compared to 19.7% of the OI sample and 18.6% of the NI sample. This does not appear to match well with previous research, which found that individuals with learning disabilities appear to be working at similar rates to the general population (Blackorby & Wagner, 1996; Murray et al., 2000; Rojewski, 1999; Sitlington & Frank, 1990; Wagner et al., 2005)

In order to understand this finding a little more, crosstabulations were completed for each group. Some previous findings have shown that men with learning disabilities work at equal proportions to the general population, but that women are likely to work less. Please see Table 3.5 for these findings. From this table, it shows that both men and women in the LD reported earning income comparatively less than the other two groups. In particular, over 40% of the women in the LD group did not report earning any income in 2003, compared to approximately 20% of the NI group and 23% of the OI group. The gap for men is smaller, with approximately 21% of the LD group, 17% of the NI group, and 16% of the OI group reporting no earned income. Again, it is not possible to

determine what has led the LD women to work at such lower rates than all of the other groups in this study. Previous studies have hypothesized that women who have been identified as LD typically have more significant learning impairments than the males do, potentially due to the way the LD is expressed in the classroom (Levine & Nourse, 1998; Rojewski, 1999; Sitlington & Frank, 1990). It would also be important to distinguish between women who are not earning income based on family or other responsibilities inside the home and women who are not earning income for other reasons.

Employment Expectations

There were very few questions asked of NLSY97 participants regarding their employment expectations. In the 2000 interviews, students were asked two questions regarding employment. First, they were asked how likely it was that, if they were going to school, that they would also be working. If they stated they did not expect to be in school five years from that date, they were asked on a scale of 0-100 to estimate how likely they would be working at least part-time. The mean and standard deviations for this question is in Table 3.5. The mean score for the LD group was 88.9%, for the NI was 93.5%, and for the OI group was 93.6%. The ANOVA test statistic, which can also be found in Table 3.8, for this was significant (F[2,7610]=17.1, p<.0005). Post-hoc tests found that the NI and OI groups had similar means, and the LD group had a significantly lower mean.

Educational Data

Highest grade completed by participant

For the last demographic, the highest grade completed by each participant, by the 2005 interview, is analyzed. For this data, NLSY staff compiled the highest grade that

each participant reported having completed throughout the years of data collection. For this reason, there may be some individuals that have achieved higher educational levels but have not been interviewed in the past few years.

For all three groups, the most common (modal) highest grade completed is the 12th grade, or completion of a high school diploma. What is clear from the information from Table 3.2 and from Figures 1 through 3, however, is that the LD group has a very different frequency distribution to that of the NI and OI groups. For the LD group, almost 40 percent of the sample does not have a high school diploma, another almost 40 percent has a high school diploma only, and only a little over 20 percent has any college attendance (Figure 1). For the NI and OI groups, a little over 25 percent have no high school diploma, a little over 25 percent has a high school diploma only, and almost 50 percent have at least some college (Figure 2 and 3). The ANOVA for this test, presented on Table 3.8, was significant (F[2,8892]=66.8, p<.0005). The post-hoc tests for this statistic found that the NI and OI groups had similar means, and the LD group had a significantly lower mean. This finding is consistent with all other educational outcomes findings in previous longitudinal research on adolescents and young adults with learning disabilities (Blackorby & Wagner, 1996; Murray et al., 2000; Rojewski, 1999; Sitlington & Frank, 1990; Wagner et al., 2005), showing that students with learning disabilities are more likely to leave high school without a diploma and less likely to enter postsecondary education.

Grade Point Average

Table 3.4 contains data regarding the means and standard deviation of the Grade Point Average (GPA) for each group. To calculate GPA for this study, NLSY 97

interviewers gathered high school transcripts for all individuals who had left high school on two separate occasions. This led to transcript data being available for approximately two-thirds (66.8%) of the participants. The NLSY 97 staff converted all grades on transcripts to a standardized GPA based on the Carnegie Credit system ("NLSY97 Codebook Supplement", 2007).

For this study, the overall GPA will be reviewed. For visual representation, the exact GPA was placed into categories in Table 3.4, but for analysis, the exact GPA is used, which is given to the hundredths place. Table 3.6 provides the mean and standard deviation for GPA for the three groups. Both the overall GPA mean and the spread of GPA is different for the LD group in comparison to the other two groups. Students in the LD group had a mean GPA of 2.53. One in five students had a GPA of 2.0 or lower, and only 23.0% had a GPA of 3.0 or higher. By comparison, the mean for the NI group was 2.84, 8.7% of students had a GPA of 2.0 or lower and 41.1% had a GPA of 3.0 or higher. In the OI group, the average GPA was 2.84, 9.7% of the group had a GPA of 2.0 or lower, and 42.2% had a GPA of 3.0 or higher. The ANOVA test, which is presented in Table 3.9 was significant (F[2,6001]=45.0, p<.0005). The post-hoc test showed that the OI and NI groups had similar means, and the LD group had a significantly lower mean.

These grades are not just implications of the relative difficulties students identified as having a learning disability in this sample have in high school, but also has strong implications for college admissions. In an environment where the majority of college admission boards do not take into account a potential learning disability in their decision, the lower GPA of students with learning disabilities likely makes gaining admission to competitive or prestigious colleges challenging (Mull & Sitlington, 2001; Vogel & Adelman, 1992; Vogel & Leonard, 1998).

ASVAB Scores

Another measure of educational achievement is the Armed Services Vocational Aptitude Battery tests, which were taken by 7,093 of the participants (79.0%). In order to provide a comparable score, NLSY97 staff created age based customized sampling weights for the tests of Mathematical Knowledge, Arithmetic Reasoning, Word Knowledge and Paragraph Comprehension, and created a percentile score between zero and 99 for each participant taking the exam ("NLSY97 Codebook Supplement", 2007). The means for each group can be found in Table 3.6. ANOVA for ASVAB scores, which is presented in Table 3.9, was significant (F[2,7809]=7.64, p<.0005). Post-hoc tests, however, did not differentiate groups. The OI group had the highest mean, and the NI and LD Groups appeared to have similar means.

SAT Scores

Part of the NLSY97 transcript analysis was to gather the SAT Verbal and Math scores for all people reporting them to the school. This test provides a marker of students who are planning on applying to four-year college institutions, as they are generally not required for community or junior college admissions. The means and standard deviations for each group can be found in Table 3.6. The ANOVA tests, presented in Table 3.10, for both the SAT Verbal (F[2,2421]=2.76, p=.06) and Math (F[2,2460]=1.33, p=.27) scores were not significant. In this case, the means for the LD group were slightly higher on both tests. The proportion of students reporting scores in all three groups was approximately 25%.

Academic Expectations

There are very few measures of academic expectations in the NLSY dataset. In previous research, it was found that, although students with learning disabilities were entering higher education at significantly lower rates than the general population, the majority of students polled say they have the goal to enter postsecondary education (Wagner et al., 2005). In 2000, NLSY97 investigators asked participants to rate, from 0-100% certainty, the chance they would be in school in five years ("NLSY97 User's Guide", 2007). See Table 3.7 for the mean and standard deviations of this data. The ANOVA (Table 3.9) for this test was significant (F[2,8022]=10.2, p<.0005). Post-hoc tests show that the NI and OI groups had similar means, and the LD group had a significantly lower mean. This result cannot be compared to the question asked in the National Longitudinal Transition Study 2 (Wagner et al., 2005). A question asking about the percent chance a student will be in school in five years may be related to a student's goals, but also may be related to the student's academic self-efficacy (Bandura, 1986). A student may have the desire to continue on in school, but believe that he or she is not capable of continuing in school. Likewise, a student may also believe that he or she is capable of continuing in school, but may have goals other than remaining in school. This question is also confounded by the age it was asked. It was asked of all participants in the 2000 survey year. At this time, students would have been between the ages of approximately 15 and 19. For some of the older students, they may have already been in school and expected to be done by 2005. A correlation run between age of participant and educational expectations for 2005 found a significant negative correlation, verifying this hypothesis (r=-.287, p<.0005).

Other Variables Identified in Previous Research

Mental Health

Issues related to mental health and self-image have been identified in the past for individuals with learning disabilities. Specifically, a few studies have found higher levels of depression and anxiety reported for individuals with learning disabilities (Beichtman et al., 2001; McNamara, Willoughby & Chalmers 2005; Morrison & Cosden, 1997). In 2000, all participants were asked a series of questions regarding their emotional state during the month previous to the survey, that were answered "All of the time", "Most of the time", "Some of the time", and "None of the time". These questions were turned into a scale, which was entitled the "Mental Health Scale", with scores that could range from 5-20. Higher scores denote more positive mental health, and lower scores might indicate emotional concerns. Cronbach's Alpha of this scale was estimated at 0.77 for internal consistency, which is above the cutoff of 0.7, which may be considered the low cut point for a scale (Garson, n.d.; "NLSY97 Codebook", 2007). The means and standard deviations for this scale is found in Table 3.7. The ANOVA (Table 3.10) was significant (F[2, 8021]=9.28, p<.0005). Post-hoc tests show that the LD group has a significantly lower mean than the NI group, but the OI group is not significantly different from either other group.

School Characteristics

A few studies have looked at the frustrations that students with learning disabilities might have with the school system, particularly the secondary school system. Students have listed difficulties with teacher expectations, boredom with special education classes, and some alienation in the school setting (Bear, Kortering, & Braziel,

2006; Brown, Higgins, Pierce, Hong, & Thoma, 2003; Kortering & Braziel, 2002). The NLSY97 asked several questions regarding the relative fairness of the school on a scale of one to four. These items were combined to create a composite score for this analysis. The Cronbach's Alpha of this scale is low (0.59), meaning that the items have low internal reliability (Garson, n.d.). Means and standard deviations for this measure can be found in Table 3.7. ANOVA (Table 3.11) for this was not significant (F[2,8980]=.963, p=.383).

Educational and Vocational Support

Social skills and social support are an area of significant focus within the context of learning disabilities. Although the NLSY97 did not directly ask about social skills, it did ask the participants to state how many people they could ask for assistance or guidance in making vocational or educational experiences, and then asked the relationship they had to the person they would ask for assistance from first. All three groups reported that they would ask their biological mother for advice the most often, and then their biological father. Please see Table 3.7 for the means and standard deviations of this measure. ANOVA (Table 3.11) for this variable was not significant (F[2,7245]=.209, p=.811), as all three groups had approximately the same number of people they would request help from on educational and employment decisions.

Relationship between Education, Income and Age

Because this is a sample that includes individuals who began the survey between the ages of 12 and 16, the last interview in 2005 would contain individuals between the ages of about 21 to 25. One of the expectations, therefore, is that older participants may be earning more income as they gain more work experience, and that older participants

will be more likely to have entered or moved further on in postsecondary education. This assumption for persons with learning disabilities has been hypothesized, as many of these longitudinal studies have only looked at students less than five years after high school completion (Blackorby & Wagner, 1996). It has been hypothesized in the past that students with learning disabilities may need some additional years of maturation before going back to college, and that, over time, the numbers of people with learning disabilities who enter college will increase (Blackorby & Wagner, 1996; Wagner et al., 1991). The only study to look at graduates more than five years out of college, however, found that the additional years out of school did not seem to make a large impact on college acquisition in the population of individuals with learning disabilities (Murray et al., 2000).

In order to determine if increasing age of participants has an impact on the highest grade completed or income earned, correlations were run to compare both variables with the age of the participants at first survey. Please see Table 3.12 for the results of these correlations. For the NI and OI group, there is a significantly positive relationship between education and age (OI: r=.064, p=.005; NI: r=.089, p<.0005), and employment and age (OI: r=.243, p<.0005; NI: r=.240, p<.0005). For the LD group, there is a significant positive relationship between employment and age (r=.197, p<.0005), but not for education and age (r=.050, p=.212). This means that, for employment, all groups are seeing a significant increase in income as they get older, but that only the OI and NI groups are seeing an increase in their educational level. The LD group is not showing the same increase in educational level over time, which matches the finding of the Murray et al. study (2000).

Limitations

The largest limitation to this study is the measure of learning disability within NLSY97. The only measure within the instrument is a question asked of the participant's guardian in the first round of surveys. Specifically, the parent or guardian was asked if the participant has a learning or emotional problem that impacts his or her education. This question leaves a lot unanswered. Does the participant have a diagnosed learning disability? Does the participant receive special education services? This limitation is similar to limitations of other large representative data sets, such as the National Educational Longitudinal Study (1988). A review of the disability indicators in NELS found that parental identification of disability was potentially more accurate than other indicators such as teacher identification (Rossi, Herting & Wolman, 1997). This indicator also makes it possible to include students with learning difficulties who have not been identified by the school system. However, the use of this measure only leads to difficulty in interpretation of the results to students with a diagnosed learning disability.

Secondly, the sample of individuals identified as having a learning disability is mixed in with individuals who are identified by their parents as having Attention Deficit Disorder (ADD). Previous research has found a significant co-occurrence of these diagnoses. For example, between 20-40% of individuals with Attention Deficit Hyperactivity Disorder (ADHD) also have a learning disability (Del'Homme, Kim, Low, Yang & Smalley, 2007). This is a significant challenge to these data, as the two populations, although overlapping, do have different issues. For example, many of the potential social and behavioral concerns discussed in the literature on learning disabilities is hypothesized to happen more frequently in individuals with ADD or ADHD (McNamara et al., 2005; Weiner, 2004). Based on how the question was asked to the

parent or guardian, there is no way to separate out the two groups in this study. Therefore, all findings must be tempered with the fact that there is an unknown proportion of this sample that may not identify as having a learning disability, but rather an attention related disorder, or identify as having both diagnoses.

Third, having only one measure of learning disability leaves the chance for individuals to either receive a later diagnosis of a learning disability, or to have it determined later that the individual does not have a learning disability. A number of individuals will be diagnosed with a learning disability in high school or later, and individuals with higher than typical intelligence scores are also likely to be diagnosed with a learning disability later in their academic career (Ferri, Gregg & Heggoby, 1997; Holliday & Koller, 1999; Mellard & Byrne, 1993) Again, this is a limitation with no solution in this study, unless that type of information was gathered along with the transcript analysis and not provided at this time.

A final limitation comes from larger issues about the definition of learning disabilities that is outside of the purview of this dissertation. The definition of learning disability is a topic of much debate. Because IDEA leaves the specifics of determining a learning disability to the school districts, each state or school district may come up with a different set of standards to determine learning disability (Gordon & Lewandowsky, 2002; Hallahan & Mercer, 2001; IDEA, 2004; "SLD Determination", n.d.). The learning disability community has also been examining and has come to consensus that alternative measurements for learning disability that follow a Response to Intervention, rather than an Aptitude/ Achievement discrepancy approach, should be utilized (NCRLD, 2007). Lastly, there is a wide range of types of learning disabilities, with varying impacts. And

thus the specific impacts of this diagnosis on the individual may be very difficult to measure. However, the information gathered from this study, with the aforementioned limitations, still has relevance for current practice and policy issues.

Discussion

These findings, although largely descriptive in nature, provide a picture of adolescents and young adults with identified learning disabilities further out from the completion of high school than most other longitudinal studies of this nature. The findings are comparable in many aspects to prior studies, but can begin to extend the thinking about the impacts of learning disability diagnoses into the longer term. The biggest finding, which replicates all prior research, is that individuals with learning disabilities have significantly lower educational outcomes, and that this is not changing as students get older. Similar to the findings by Murray et al. (2000), and to Blackorby and Wagner (1996), individuals with learning disabilities were seen to enter postsecondary education at lower rates and are less likely to remain in postsecondary education than the general population. The other finding that replicates previous research is that individuals with learning disabilities are earning less in income than an individual in the general population.

The more surprising finding in this data is that individuals who are classified as having another health, emotional, or learning impairment other than a learning disability or Attention Deficit Disorder, are performing at similar levels to the general population regarding the highest grade completed, income, employment expectations, GPA, and academic expectations. Possible explanations for this finding is that this group is inclusive of almost any impairment, from very minor to significant. This may alter the

outcomes in some way. What it does support, at any rate, is the need to do separate research on individual disability categories, rather than completing blanket studies comparing individuals with disabilities to individuals without a diagnosed disability. It also points to the need for professionals working with individuals with disabilities to have an understanding of the impacts of specific disabilities to insure that interventions and support are appropriate for their client populations.

Within the group of individuals with learning disabilities, there are additional findings that should continue to be explored. As in previous research, women with a diagnosed learning disability are less likely to be working, and will receive lower earnings, than men with a learning disability. It is also important to continue to explore the cultural and socioeconomic differences in learning disability identification. In this study, persons identifying as Hispanic were far less likely to be identified with a learning disability. It would also be important in future research to gather a sample that identifies groups such as Native Americans, a group that has been overrepresented among those diagnosed with learning disabilities, and Asian Americans, a group that has been underrepresented in the school systems in terms of learning disability diagnoses.

Finally, it is important to look at the academic findings other than GPA and highest grade completed, particularly when making recommendations and advocating for individuals with learning disabilities to go into postsecondary education. In this study, although not significant, students in the LD group actually had higher ASVAB scores and SAT scores than the NI groups, although similar proportions of each group completed each test. It is not possible to determine the reasons why this finding occurred, but should be explored in future research.

As the NLSY97 continues to complete interviews of their participants, so should investigation into these variables, particularly the educational and employment related variables, continue. With the annual data, trend analysis and other longitudinal measures could be used to gain a deeper understanding of the various trajectories that adolescents and young adults follow in their education and employment. Relationships of variables to educational and employment outcomes is another important area of research. Finally, this research should allow for the participants to be followed for at least a decade, with the benefit of a relatively large sample size, which, to this point, has not been published in the literature. The only longitudinal studies following individuals with learning disabilities for a decade or longer have been small samples that have been largely studied in a qualitative fashion (Goldberg et al., 2003; Wong, 2003) The findings from continued research on the NLSY97 will allow researchers to test some of the findings of those studies.

Sample size, Sex, Race/ Ethnicity, and Age of Participants

		LD	NI	ΟΙ
	· · · · · · · · · · · · · · · · · · ·			
Sample Size		n= 623	n= 6387	n=1974
		(6.9%)	(71.1%)	(22.0%)
Sex			<u> </u>	
	Male	426 (68.4%)	3167 (49.6%)	1006 (51.0%)
	Female	197 (31.6%)	3220 (50.4%)	968 (49%)
Race/ Ethnicity				
	Non Black/ Non	386 (62.0%)	3137 (49.1%)	1142 (57.9%)
	Hispanic			
	Black	152 (24.4%)	1715 (26.9%)	468 (23.7%)
	Hispanic	79 (12.7%)	1481 (23.2%)	341 (17.3%)
<u> </u>	Mixed Race/	6 (1.0%)	54 (0.8%)	23 (1.2%)
	Non Hispanic			
Age 12/31/96	<u> </u>			
	12 years old	135 (21.7%)	1253 (19.6%)	383 (19.4%)
<u></u>	13 years old	142 (22.8%)	1254 (19.6%)	411 (20.8%)
	14 years old	121 (19.4%)	1348 (21.1%)	372 (18.8%)
	15 years old	118 (18.9%)	1345 (21.1%)	411 (20.8%)
	16 years old	107 (17.2%)	1187 (18.6%)	397 (20.1%)

Note: Numbers do not equal total sample due to missing data. Proportions are of the people who responded to this question, rather than to the entire sample.

Income Earned by Participant in Categories

		LD	NI	OI
Income earned by				
participant				
	None	146 (27.7%)	1001 (18.6%)	337 (19.7%)
	\$1-5,000	113 (21.4%)	1224 (22.8%)	367 (21.5%)
	\$5,001-10,000	78 (14.8%)	912 (17.0%)	301 (17.8%)
	\$10,001-25,000	144 (27.3%)	1720 (32.0%)	530 (31.0%)
	\$25,001-50,000	38 (6.1%)	446 (8.3%)	149 (8.7%)
	50,001 +	8 (1.3%)	72 (1.3%)	22 (1.3%)

Note: Numbers do not equal total sample due to missing data. Proportions are of the

people who responded to this question, rather than to the entire sample.

Highest Grade Completed and Highest Degree Completed

		LD	NI	ΟΙ
Highest Grade			·····	
Completed				
	2 nd -8 th grade	59 (9.6%)	310 (4.9%)	101 (5.1%)
	9 th -11 th grade	172 (27.9%)	1234 (19.5%)	412 (21.0%)
	12 th grade	245 (39.8%)	1725 (27.2%)	532 (27.2%)
	1 st year college	44 (7.1%)	677 (10.7%)	198 (10.1%)
	2 nd year college	44 (7.1%)	757 (12.0%)	259 (13.2%)
	3 rd year college	26 (4.2%)	610 (9.6%)	168 (8.5%)
	4 th year college	15 (2.4%)	711 (11.2%)	208 (10.6%)
	5 th year college	8 (1.3%)	217 (3.4%)	58 (3.0%)
	6 th year college +	3 (0.4%)	80 (1.2%)	21 (1.1%)
Highest				
Degree				
	No H.S. Diploma	231(37.5%)	1544 (24.4%)	513 (26.0%)
	H.S. Diploma	245 (39.8%)	1725 (27.2%)	532 (27.2%)
	Some College/	140 (22.8%)	3052 (48.3%)	912 (46.2%)
	College Degree			

Note: Numbers do not equal total sample due to missing data. Proportions are of the people who responded to this question, rather than to the entire sample.

Grade Point Average in High School

• • • • • • • • • • • • • • • • • • • •		LD	NI	OI
Grade Point Average (HS				
Transcript				
	~1.0	12 (3.2%)	58 (1.4%)	18 (1.3%)
	~1.5	30 (8.1%)	133 (3.1%)	51 (3.7%)
	~2.0	71 (19.2%)	506 (11.9%)	156 (11.4%)
	~2.5	112 (30.3%)	1089(25.5%)	330 (24.1%)
	~3.0	104 (28.1%)	1327(31.1%)	469 (34.3%)
	~3.5	33 (8.9%)	915 (21.5%)	269 (19.6%)
	~4.0	8 (2.2%)	237 (5.6%)	76 (5.6%)

Note: Numbers do not equal total sample due to missing data. Proportions are of the

people who responded to this question, rather than to the entire sample.

Crosstabulation of Gender by Income Categories

		No	\$1-5,000	\$5,001-	\$10,001-	\$25,001-	50,001 +
		Income		10,000	25,000	50,000	
LD							
	Men	77	66	63	114	31	8
		(21.4%)	(18.4%)	(17.5%)	(31.8%)	(8.6%)	(2.2%)
	Women	69	47	15	30	7	0
		(41.1%)	(28.0%)	(8.9%)	(17.9%)	(4.2%)	(0.0%)
NI			· • • • • • • • • • • • • • • • • • • •				
	Men	453	502	380	925	285	59
		(17.4%)	(19.3%)	(14.6%)	(35.6%)	(10.9%)	(2.3%)
	Women	548	722	532	795	161	13
		(19.8%)	(26.1%)	(19.2%)	(28.7%)	(5.8%)	(0.5%)
ΟΙ		<u></u>				·····	
	Men	138	178	146	279	92	13
		(16.3%)	(21.0%)	(17.3%)	(33.0%)	(10.9%)	(1.5%)
	Women	199	189	158	251	57	9
		(23.0%)	(22.0%)	(18.3%)	(29.1%)	(6.6%)	(1.0%)

Note: Numbers do not equal total sample due to missing data. Proportions are of the people who responded to this question, rather than to the entire sample.

	LDn			n In			OI n		
	(N=623)	LD Mean	LD SD	(N=6387)	NI Mean	NI SD	(N=1974)	OI Mean	OI SD
Income	527	1.69	1.39	5375	1.92	1.32	1709	1.91	1.33
Employment	547	88.9	24.6	5692	93.65	17.7	1796	93.61	18.3
Expectations									
Highest	616	11.58	2.14	6322	12.75	2.42	1957	12.64	2.41
Grade									
Completed									
Overall GPA	370	2.53	63.3	4265	2.84	61.0	1369	2.84	61.0
ASVAB Score	492	45.0	29.0	4993	44.5	29.0	1607	47.8	29.4
SAT Verbal	149	3.89	1.1	1745	3.75	1.1	530	3.87	1.2
SAT Math	150	3.85	1.1	1777	3.75	1.2	536	3.84	1.2

ational Variables A Educ . € E 20 Moons and Standard Deviation

Table 3.6

	LD n			NI n			OI n		
	(N=623)	LD Mean	LD SD	(N=6387)	NI Mean	NI SD	(N=1974)	OI Mean	OI SD
Academic	546	37.1	38.1	5688	44.8	38.3	1791	44.1	38.1
Expectations in									
Five Years									
Mental Health	556	15.0	2.8	5670	15.4	2.5	1796	15.2	2.6
Scale									
School Fairness	623	11.0	2.1	6386	11.1	2.1	1974	11.1	2.1
Educational	510	5.0	9.6	5123	5.2	7.5	1615	5.27	7.4
Vocational									
Support									

Means and Standard Deviations of Participant Interview Measures

Table 3.7

		Sum of		Mean		
		Squares	df	Square	F	Sig.
Income	Between	05.010		10.007	7.00	001
	Groups	25.812	2	12.906	7.33	.001
	Within					<u>.</u>
	Groups	13392.699	7608	1.760		
	Total	13418.511	7610			
Chance	Between			······································		
Working in 5	Groups	11437.015	2	5718.508	17.1	.000
years						
	Within	2697410 105	8022	224 599		
	Groups	208/410.125	8032	<i>33</i> 4.388		
	Total	2698847.140	8034		·····	<u> </u>
Highest grade	Between					
completed	Groups	770.682	2	385.341	66.8	.000
	Within					
	Groups	51285.598	8892	5.768		
	Total	52056.281	8894	. <u></u>		

ANOVA Table of Income, Employment Expectations, Highest Grade Completed

		Sum of		Mean		
		Squares	df	Square	F	Sig.
Credit	Between		·	·····		
weighted	Groups	336781.421	2	168390.711	45.0	.000
overall GPA.						
••••••••••••••••••••••••••••••••••••••	Within					
	Groups	22468348.358	6001	3744.101		
	Total	22805129.779	6003			
ASVAB	Between	12984729711.7		649236485		
Score	Groups	23	2	5.861	7.64	.000
	Within	602313624866		849645401.	<u></u>	
	Groups	1.320	7089	137		
	Total	603612097837				
		3.050	7091			
% Chance in	Between					
School 5	Groups	29678.394	2	14839.197	10.2	.000
Years						
<u></u>	Within					
	Groups	11713438.771	8022	1460.164		
	Total	11743117.166	8024			

ANOVA Table of GPA, ASVAB, and Academic Expectations

		Sum of		Mean	_	
		Squares	df	Square	F	Sig.
SAT Verbal	Between					
	Groups	7.244	2	3.622	2.76	.064
• • · · · · · · · · · · · · · · · · · ·	Within					
	-	3178.634	2421	1.313		
	Groups					
	Total	3185.877	2423	- <u>.</u>		
SAT Math	Between					
	_	3.897	2	1.949	1.33	.265
	Groups					
	Within					
		3606.508	2460	1.466		
	Groups					
	Total	3610.405	2462		<u> </u>	
Mental	Between	119 974	2	59 987	9.28	000
Health Scale	Groups	117.774	L	57.707	7.20	
	Within				· · · · · · · · · · · · · · · · · · ·	
	Crowner	51908.287	8019	6.473		
	Groups					
	Total	52028.261	8021			

ANOVA Table of SAT Scores and Mental Health Scale

		Sum of		Mean		~
		Squares	df	Square	F	Sig.
School	Between				<u></u>	
Fairness	Groups	8.505	2	4.253	.960	.383
	Within					-
	Groups	39762.705	8980	4.428		
	Total	39771.210	8982			
# People for	Between				<u>.</u>	
education,	Groups	24.567	2	10 000	200	011
employment		24.307	2	12.283	.209	.811
advice						
<u> </u>	Within					
	Groups	425218.316	7245	58.691		
	Total	425242.883	7247			

ANOVA Table of School Fairness Scale and People Available for Support

Correlations of Highest Grade Completed, Income with Age

	Highest Grade	Probability	Income with	Probability
	Completed with	value	Age Correlation	Value
	Age Correlation			
LD Group	.050	.212	.197	<.0005
NI Group	.089	<.0005	.240	<.0005
OI Group	.064	.005	.243	<.0005

Figure 1

Frequency Distribution of Highest Grade Completed, LD group

Histogram of Highest Grade Completed



Learning Disability Group

Figure 2

Frequency Distribution of Highest Grade Completed, NI Group

Histogram of Highest Grade Completed



No Impairment Group

Figure 3

Histogram of the Highest Grade Completed, OI Group

Histogram of the Highest Grade Completed



Other Health or Learing Impairment

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CHAPTER FOUR

Application of the Social Cognitive Career Theory to the Educational Outcomes of Adolescents with Learning Disabilities

Abstract

The factors impacting postsecondary education for individuals with learning disabilities are still largely not understood. Lent, Hackett, and Brown's (1994, 1996, 1999) Social Cognitive Career Theory (SCCT) was utilized to identify potential factors influencing the educational performance of students with learning disabilities. Using the National Longitudinal Survey of Youth, 1997 Cohort (NLSY97) database, hierarchical regression analyses were completed for individuals with a diagnosed learning disability, for individuals with other identified learning or medical impairments, and for individuals with no identified impairments. Support for the SCCT model was found in all three groups of participants, although the factors influencing the group of participants with learning disabilities are found to vary from the other two groups in the areas of age, sex of the participant, and achievement test scores. Implications for social work practice with transition aged students with learning disabilities is discussed.

Introduction

Individuals with learning disabilities (also called specific learning disabilities) comprise one of the largest groups of individuals with disabilities. The U.S. Department of Education estimates that approximately half of all children with disabilities in public

school have a learning disability ("Children with Disabilities", 2007). Although there are no statistics on the numbers of adults with learning disabilities, it is clear from research that this is a diagnosis with lifelong implications, so it is likely that the prevalence of the diagnosis remains fairly stable (Goldberg, Higgins, Raskind & Herman, 2003; Hollenbeck, 2007; NRCLD, 2007). Boys tend to be diagnosed with learning disabilities more often and earlier in their academic careers (Bloom & Day, 2006; "Children with Disabilities", 2007; Wagner, Newman & Cameto, 2004). Individuals with diagnoses of learning disabilities, by definition, have near typical to above typical intelligence, but have difficulties with one or more areas of academics (IDEA, 2004).

Educational achievement in general, and postsecondary educational achievement in particular, have been particular areas of concern for individuals with learning disabilities. Approximately 25% of students with learning disabilities in public school will leave school without a high school diploma (Wagner, Newman, Cameto, Garza & Levine, 2005). This is significantly lower than high school graduation rates in the general population.

It is in the rates of college enrollment and attainment that even larger educational disparities occur between individuals with learning disabilities and individuals without a learning disability. In 2001, the Cooperative Institutional Research Program, a survey of freshman in four-year colleges, found that 2.4% of all college freshman identified as having a learning disability. This is approximately 40% of all students identifying as having a disability that entered four-year programs (Henderson, 2001). This is significantly lower, however, from the approximately 6% of students identified as having a learning disability in the public school system ("Children with Disabilities", 2007).

Approximately one in three students with learning disabilities will go on to receive some postsecondary education, but only a small proportion of that group will complete any postsecondary degree (Blackorby and Wagner, 1995; McAllister, 2008; Murray, Goldstein, Nourse & Edgar, 2000; Sitlington & Frank, 1990; Rojewski, 1999; Wagner et al., 1991; Wagner et al., 2005). For example, Murray, Goldstein, Nourse and Edgar found that, in their five-year follow up of 1990 high school graduates and a ten-year follow up of 1985 high school graduates, postsecondary graduation rates for individuals with learning disabilities were approximately 19% at five years and 43% at ten years, compared to 35% at five years and 55% at ten years for individuals without a learning disability. The most striking difference is in graduation rates from four-year colleges. At ten years, 2.4% of individuals with learning disabilities had graduated from a four-year college compared to 45.5% of individuals without a learning disability (Murray et al., 2000).

Previous research has explored a number of potential reasons to explain these postsecondary educational disparities. Some potential variables hypothesized to impact lower educational achievement levels include: low self-determination skill levels (e.g. Algozzine, Browder, Karvonen, Test, & Wood, 2001; Field, 1996; Wehmeyer & Field, 2004), less academic preparation (Rossi, Herting, & Wolman, 1997; Wagner et al., 2003), less family and school support for postsecondary education (e.g. Bender, 2004; Cosden, 2001; Newman, 2005; Yehahey & Mestaova, n.d), lower status vocational aspirations (Rojewski, 1999), little understanding of the impacts of their disability and the accommodations that could be useful to them (Cosden & Elliott, 1999; Field, 1996; Goldberg et al., 2003; Skinner & Lindstrom, 2003), and poor social skills (e.g.

Bauminger & Edelstein, 2005; Bryan, 2005; Cartledge, 2005; Elias, 2004; Kavale and Mostert, 2004; Vaughn & Haager, 1994).

Although all of these variables have been shown to have significant impacts on children, adolescents, and adults with learning disabilities, there has not been a model to describe the relationships between these variables and their impact on educational achievement. One model that may be able to assist in understanding and predicting educational achievement is the Social Cognitive Career Theory (SCCT), which has been applied to the ways that children and adolescents find career and academic interests, make career and academic choices, and achieve various levels of academic and career success (Brown & Lent, 2006; Lent, Hackett, & Brown, 1999). SCCT has been shown to be effective in determining college interests, postsecondary academic self-efficacy, and college performance (Brown, Tramayne, Hoxha, Telander, Fan & Lent, n.d.; Ali & Saunders, 2006). SCCT has also shown promise in predicting career exploration intentions in individuals with learning disabilities (Ochs & Roessler, 2004), but has not yet been applied to academic related issues for individuals with learning disabilities. *Social Cognitive Career Theory (SCCT)*

The Social Cognitive Career Theory was initially developed by Lent, Brown and Hackett (1994) to explain the processes individuals go through to develop vocational and academic interests, make choices about education and work, act on these choices, and potentially find success in a career. Like other social cognitive theories, SCCT is based on the work of Bandura and his theories of social learning, particularly focusing on the area of self-efficacy (1986, 1997). Unlike previous career development theories, however, the SCCT model tried to take into account constructs such as vocational

interests, abilities, and vocational goals, and processes such as career choice and vocational change during a career (Lent et al., 1996). This is a move away from the historical vocational trait theories that previously dominated career development theory (Lent et al., 1994). This model also uses Bandura's triadic reciprocal model of causality, where person specific attributes, external environment factors and overt behaviors are interactive, bidirectional variables, rather than the previous models of causation that did not take into account the changes that overt behaviors can make on attributes and the external environment (Bandura, 1986, Lent et al., 1996). Therefore, SCCT is interested in the ways that variables interact with each other over time to lead to the choices individuals make about education and career, rather than looking at career and academic choice as a static event.

SCCT posits that there are three interacting variables: self- efficacy, outcome expectations, and interest/ goal formation, that work together to affect the process of career and academic interests, goals, actions, and performance (Lent et al., 1994, 1996; Swanson & Fouad, 1999). Self-efficacy, which is described as the most important of the three variables, is defined by Bandura as "beliefs in one's capacity to organize and execute the courses of action required to produce given attainments." (Bandura, 1997, p. 3) and is a "dynamic set of beliefs that are specific to particular performance domains and interact complexly with other person, behavior and contextual factors" (Lent et al., 1996, p. 83). Outcome expectations are the outcomes the individual believes will occur if a particular behavior is performed (Lent et al., 1996). Finally, interests, goal formation, actions, and performance is the actual process of making and carrying out individual vocational and academic choices (Brown & Lent, 2006; Lent et al., 1994).

The variables of self-efficacy, outcome expectations, and goals are further influenced by individual variables such as gender, ethnic background, socioeconomic status, disability status, which are termed "person inputs" (Lent et al., 1999). These variables are seen to alter the individual's opportunity structures. As these variables change the environment around the individual, the individual will then alter their selfefficacy beliefs, outcome expectations, and goals. For example, in this theory, women may not enter the field of math and science because social pressures to stay out of the field may create environmental hardships, thereby creating a situation where a person's self-efficacy beliefs change, leading to a move away from math and science as a career (Lent et al., 1994).

The model also includes proximal and background contextual affordances. Based on work by Vondracek, contextual affordances are parts of the individual's environment that may support or be a barrier to the individual (cited in Lent et al., 1994). The SCCT model breaks these contextual affordances into background and proximal affordances. Background contextual affordances are variables that impact the person's view of him or herself, and will shape their learning experiences and self-perception. Proximal contextual affordances are environmental variables that directly affect or moderate an individual's goals and actions as they are making them, rather than in the process of carrying out those goals and actions (Brown & Lent, 2006; Lent et al., 1994, 1996). Some contextual affordances discussed include cultural values, socioeconomic status and familial support (Brown & Lent, 2006).

SCCT Career/ Academic Choice Model

Three models were derived from this basic theoretical structure: vocational and educational interests, occupational and academic choice, and occupational and educational performance (Lent et al., 1994, 1999). This study utilizes the career choice model in looking at academic achievement. In this model, person inputs such as sex, mental health, race, personality dispositions, and health or disability, along with background contextual affordances, lead to particular learning experiences. These learning experiences become the basis for the individual's self-efficacy and outcome expectations regarding their perceived ability and belief in positive outcomes for continuing his or her education. These self-efficacy and outcome expectations impact the individual's educational interests, goals, and ultimately educational actions of leaving, continuing on, and completing high school and postsecondary education. These interests, goals and actions will also be moderated and directly affected by proximal contextual affordances (Brown & Lent, 2006; Lent et al., 1994, 1996).

Research Questions and Hypotheses

The main purpose of this study is to examine the ability of the SCCT career and academic choice model to predict academic achievement levels, or the highest grade completed by individuals with learning disabilities, individuals with other types of health and learning impairments, and individuals without any identified impairment. The secondary purpose of this study is to examine the similarities and differences between the individual variables, if any, predicting academic achievement in these three groups. With this in mind, the research questions are as follows:

Research Question 1: Does the SCCT Career and Academic Choice Model predict academic achievement of individuals identified with a learning disability?

Research Question 2: Does the SCCT Career and Academic Choice Model predict academic achievement of individuals identified with health or learning impairments other than a learning disability?

Research Question 3: Does the SCCT Career and Academic Choice Model predict academic achievement of individuals with no identified impairment?

Research Question 4: What are the similarities and differences of model fit between individuals with learning disabilities, individuals identified with health or learning impairments other than a learning disability, and individuals with no identified impairment?

In order to answer Research Questions 1 through 3, hierarchical linear regression will be completed on each of the subgroups. Hierarchical linear regression is used when predictor variables are added in blocks to the regression model based on a particular theoretical construct (Garson, n.d. a; Tabachnick & Fidell, 2007). To answer Research Question 4, the three models will be compared with one another. SPSS Version 15.0 for Windows (2006) was used to perform all analyses. The Type I error rate for rejection of the statistic of .05 was set for all tests.

The following hypotheses were generated for the SCCT Model for adolescents with learning disabilities, based on previous research done in this area.

Hypothesis 1: The full model will be the best predictor of the highest grade achieved by adolescents with learning disabilities.

Hypothesis 2: Sex will be a significant predictor of the highest grade achieved for adolescents with learning disabilities, when all other model predictors are controlled. Specifically, males will have a higher level of academic achievement, as measured by the highest grade achieved. This is based on the theory that females who are diagnosed with a learning disability are often more impaired than males with the diagnosis.

Hypothesis 3: Race/ethnicity will not be a significant predictor of the highest grade achieved for adolescents with learning disabilities when all other predictors are controlled.

Hypothesis 4: A participant's score on the mental health scale will be a significant predictor of highest grade achieved for adolescents with learning disabilities when all other predictors are controlled.

Hypothesis 5: The participant's expectation of percent chance he or she will be in school in 2005, asked in 2000, will be a significant predictor of highest grade achieved for adolescents with learning disabilities when all other predictors are controlled.

Hypothesis 6: The highest degrees achieved by the participant's biological mother and father will be significant predictors of the highest grade achieved for adolescents with learning disabilities when all other predictors are controlled.

Hypothesis 7: The income earned by the participant in 2003 will not be a significant predictor of highest grade achieved for adolescents with learning disabilities when all other predictors are controlled.

Hypothesis 8: The number of biological children the participant has will be a significant predictor of the highest grade achieved for adolescents with learning disabilities when all other predictors are controlled.

Hypothesis 9: The amount of government assistance received by the participant will be a significant predictor of the highest grade achieved for adolescents with learning disabilities when all other predictors are controlled.

Hypothesis 10: The participant's high school grade point average (GPA) will be a significant predictor of the highest grade achieved for adolescents with learning disabilities when all other predictors are controlled.

Hypothesis 11: The participant's perception of high school fairness, measured in 1998, will not be a significant predictor of the highest grade achieved for adolescents with learning disabilities when all other predictors are controlled.

Hypothesis 12: The participant's perception of the proportion of his or her peers that will go to college will be a significant predictor of the highest grade achieved for adolescents with learning disabilities when all other predictors are controlled.

Method

Study Population

In order to answer these questions using a large, representative sample of adolescents leaving the K-12 system and entering into various post high school outcomes, one of the samples of the National Longitudinal Surveys (NLS) was chosen. The National Longitudinal Survey of Youth, 1997 (NLSY97) was chosen because of the relative recency of the survey, the sample size, the ability to gather a sample of adolescents with learning issues, and the types of questions asked of the participants. NLSY97 is a longitudinal panel study of young people with beginning ages of 12-16 as of 12/31/96 (born between 1980 and 1984). The researchers gathered the initial sample by screening 75,291 houses within 147 nonoverlapping primary sampling units ("NLSY97 User's Guide", 2007). Interviewers requested that, within the identified homes, all household residents born between 1980 and 1984 participate in the sample. This led to 8,984 participants within 6,819 households ("NLSY 97 Users Guide", 2007). Of this sample, there is both a cross-sectional sample of the US population (6,748 initial participants) as well as an oversample of Hispanic and black individuals (2,236 initial participants) ("NLSY User's Guide, 2007). Data have been collected on the survey participants on an annual basis. Currently, the retention rate for NLSY 97 is 81.7 for Round Nine ("NLSY97 User's Guide", 2007). The most recent round of data available is Round Nine, which was collected in 2005.

The NLSY 97 survey began with an interview of the primary guardian of the participant and a separate interview with the participant. After the initial year, the participant was the only person interviewed. A wide array of data regarding education, employment, family status, health, attitudes, beliefs, expectations, socioeconomic variables, and demographic data were gathered. In addition, a number of other data sources were used. Students were given the Armed Services Vocational Aptitude Battery (ASVAB) test and career inventories. Finally, participants' schools were asked for final high school transcripts, which provided information regarding courses completed, Grade Point Average (GPA), and Scholastic Aptitude Test scores, if the participant reported the scores to the school. ("NLSY97 User's Guide", 2007).

Identification of the Sample

In order to analyze the data, three subsets of the sample were created in order to be able to compare the participants with an identified learning disability with persons with another identified physical, behavioral or emotional impairment and to persons with

no identified impairments. The first subset, which is the sample of participants labeled as having a learning disability (LD), was identified with a question asked of the participant's parent or guardian at the time of the first interview. Specifically, the participant's parent or guardian was asked if the participant had a learning disability such as dyslexia or attention disorder, after stating "yes" to a question of whether or not the student had a learning or emotional problem that limits the participant's school or work performance ("NLSY Parent Questionnaire", 1997). This particular question was used because there was no other question asked regarding learning disability asked of the entire sample at any other time. This led to a sample of 623 individuals, which is 6.9% of the total sample. Limitations of this identification method are discussed in the limitations section of the paper.

The second subset consists of participants who were identified as having any other physical, behavioral or emotional impairment and are labeled as Other Impairment (OI). This was calculated by combining the yes responses to three impairment related questions that were asked of the participant's parent or guardian in the first interview ("NLSY Parent Questionnaire", 1997). This led to a sample of 1,974 individuals, which is 22.0% of the total sample. It is important to clarify that some of the individuals in the LD group may have other physical, emotional, or behavioral co-occurring impairments, but the OI group does not have any individuals identified by the parent or guardian as having a learning disability such as dyslexia or attention disorder. The third subset of the sample, identified as No Impairment (NI) consists all of the other participants of the study, and is the group of individuals who did not have a parent or guardian identify that the participant had any type of physical, behavioral, or emotional impairment.

Identified Variables for Analysis

Utilizing the NLSY 97 Web Investigator system, the NLSY97 Codebook, the NLSY97 Interview guides for the parent/ guardian and participant, and the NLSY97 User's Guide, a number of variables with relevance to the SCCT career/ academic choice model were identified. The model under examination in this paper is an abbreviated model, as there were no identified variables available for outcome expectations, interests, or goals. There were, however, a number of relevant variables for the person inputs, contextual affordances, learning experiences, self-efficacy measures, and actions. These will be the areas of the SCCT career/ academic choice model tested in this study. In the SCCT model, the areas of person inputs, learning experiences, proximal and distal contextual affordances, self-efficacy and actions will be tested.

Person Inputs

Several person inputs, or demographic variables were utilized. The first is the sex of the individual. Sex has been found to be a significant predictor of career and academic choice in both populations of individuals with learning disabilities, as well as for individuals without a diagnosed disability (Rojewski, 1999). The SCCT Model also identified sex as an important variable based on the impacts it can have in terms of cultural values and sex role stereotyping (Lent et al., 1994, 1996).

Race/ethnicity is another key variable identified by the SCCT Model for its potential impacts on resource availability, cultural values and racial/ ethnic stereotyping (Lent & Worthington, 2000). NLSY was designed with an oversampling for individuals identifying as African American/ Black and Hispanic/ Latino in order to be able to have stronger power when looking at race/ethnicity as part of the analysis. NLSY97 created

four racial/ ethnic categories for the study. These include Black/ African American, Hispanic/ Latino, Mixed Race/ Non Hispanic, and Non Hispanic/ Non Black, which includes all other racial/ ethnic groups in the study sample ("NLSY97 Codebook", 2007). Two dummy variables were created to represent the sample of individuals who were African American/ Black and Hispanic/ Latino, with the Non-Black/ Non-Hispanic group used as a reference category. The category Mixed Race/ Non Hispanic was removed from the analysis due to the small size of the category.

Age is another potential person input of importance in this study, as study participants ranged in age from 12 to 16 at the beginning of the study. Individuals who were older at the beginning of the study have had more time out of high school to potentially enter postsecondary education, so it is possible that age has a relationship to the highest degree completed. Table 4.1 provides the means and standard deviations of the ages for all three subgroups.

Finally, the mental health scale used by NLSY97 is used in person inputs, as mental health is seen as a person input in the SCCT model (Brown & Lent, 2006; Lent et al., 1996). In 2000, all participants were asked a series of questions regarding their emotional state during the month previous to the survey, and were answered "All of the time", "Most of the time", "Some of the time", and "None of the time". These questions were turned into a scale, which was entitled the "Mental Health Scale", with scores that could range from 5-20. Higher scores denote more positive mental health, and lower scores might indicate emotional concerns. Cronbach's Alpha of this scale was estimated at 0.77 for internal consistency, which is above the cutoff of 0.7, which may be considered the low cut point for a scale (Garson, n.d. b; "NLSY97 Codebook", 2007).

Table 4.1 provides the means and standard deviations of the mental health scale for all three subgroups.

Self-efficacy Variable

In this study, the only question that links to self-efficacy was asked in Round Four in 2000. All participants were asked to estimate the percent chance, from 1 to 100, that they would be in school five years from the date of the interview ("NLSY97 User's Guide", 2007). This has a link to self-efficacy as defined by Lent, Hackett, and Brown (1994, 1996), as it is asking how likely they would be to complete an action, which is a way of determining the individual's measurement of ability to continue on in school. The limitations of using this variable to determine self-efficacy will be discussed in the limitations section of this paper. Table 4.1 provides the means and standard deviations of this data for all three subgroups.

Contextual Affordance Variables

Because the determination of whether or not a contextual affordance is proximal or background to the individual is based on that person's perspective (Brown & Lent, 2006; Lent et al., 1996), this category is collapsed into one block of variables. A number of variables were identified in this section. First, the highest degree achieved by the participant's biological mother and father were identified. This may impact both the socioeconomic status of the family, but also the amount and types of support parents will give to higher education. Table 4.2 provides the means and standard deviations for these data for all three subgroups. It is presented in the scale provided by NLSY97. The categories are as follows: 1=No Degree; 2=General Educational Development Certification (GED); 3=High School Diploma; 4=Associate/ Junior College;

5=Bachelor's Degree; 6=Master's Degree; 7=Ph.D.; 8=Professional Degree ("NLSY97 Codebook", 2007).

The number of biological children the participant was also used as a contextual affordance, as having children will alter the participant's priorities and ability to remain in school. Table 4.2 provides the means and standard deviations of this measure for all three subgroups. Finally, the amount of government assistance and participant's income are measures of socioeconomic status, which is another factor identified in the SCCT model within proximal and background contextual affordances (Lent et al., 1994, 1996). Table 4.2 lists the means and standard deviations for all three subgroups on both of these socioeconomic measures.

Learning Experiences

A number of learning experience variables were identified, as these experiences would have shaped a participant's attitudes towards education and ability to continue on in higher education. The variables identified include Grade Point Average (GPA), Armed Services Vocational and Aptitude Battery, a School Fairness scale, and the proportion of the participant's peers the participant believes will go to college. To calculate GPA for this study, NLSY 97 interviewers gathered high school transcripts for all individuals who had left high school on two separate occasions. This led to transcript data being available for approximately two-thirds (66.8%) of the participants. The NLSY 97 staff converted all grades on transcripts to a standardized GPA based on the Carnegie Credit system ("NLSY97 Codebook", 2007). Table 4.3 presents the means and standard deviations for all three subgroups on this measure. For the ASVAB scores, which were taken by 7,093 of the participants (79.0%), NLSY97 staff created age based customized sampling weights for the tests of Mathematical Knowledge, Arithmetic Reasoning, Word Knowledge and Paragraph Comprehension, and created a percentile score between zero and 99 for each participant taking the exam ("NLSY97 Codebook", 2007). Table 4.3 presents the means and standard deviations for all three subgroups on this measure.

For the School Fairness scale, NLSY97 asked several questions regarding the relative fairness of the school on a scale of one to four. These items were combined to create a composite score for this analysis. The Cronbach's Alpha of this scale is low (0.59), meaning that the items have low internal reliability (Garson, n.d. b). Finally, students were asked what proportion of their peers would go to college, with responses being "Almost None (less than 10%)", "About 25%", "About half (50%)", "About 75%", and "Almost All (more than 90%)" ("NLSY97 Codebook", 2007). Table 4.3 presents the means and standard deviations for all three subgroups on this measure.

Results

Descriptive Statistics

Although this is not a primary focus of this particular study, a number of these variables differ significantly between the three identified sub-groups in this study (individuals with learning disabilities, individuals with other health or learning impairments, and individuals with no identified impairment). On almost all variables, the groups of individuals with other identified health and learning impairments are similar to each other, and the group of individuals with learning disabilities have lower levels of education, are more likely to be male, less likely to be Hispanic/ Latino, to have lower academic expectations,

to have a lower mental health score, to have parents with lower levels of education, lower income, higher amounts of government assistance, fewer biological children, and a lower GPA. (For more information regarding these similarities and differences, please see McAllister, 2008.)

Missing Data

Like many longitudinal studies, almost every variable in the NLSY97 has some proportion of missing data. In addition, a number of questions or sections of interviews were asked only of a subsection of the study population, typically based on the age of the participant ("NLSY97 User's Guide", 2007). In order to manage missing data, two strategies were used. First, the only variables used in this study were those that were posed to the entire sample, rather than a subsection of the population. In addition, analyses were run and compared between the scenario where missing data were removed from the study listwise, and where missing data were imputed using linear interpolation (Tabanchnick & Fidell, 2007). The significant reduction in sample size along with significant results in some individual variables led to the decision to use linear interpolation for missing values (Tabanchnick & Fidell, 2007).

Correlations

Zero-order correlations were run on the data for all three groups before running regression analyses to determine the relationships both between predictors and outcome variables, but to look at the relationships between individual variables. For the LD group, the only variables that are not significantly correlated to the highest grade completed are age, income of the participant, ASVAB scores, the school fairness scale, and the proportion of peers planning to go to college. For the OI group, the only variable not

significantly correlated to the highest grade completed is the income of the participant. For the NI group, all of the variables are significantly correlated with the highest grade completed. Because all of the variables are correlated with the NI group, all of the potential predictor variables will be used in the hierarchical regression models for comparison between groups. Because there are a number of significant correlation between predictor variables, multicollinearity diagnostics were completed during the regression analyses. There were no identified variables in any of the regression models that would lead to threats of multicollinearity (Garson , n.d.a).

Model Blocks for Hierarchical Regression

Four blocks of variables were created for the hierarchical regression based on the theoretical constructs of the SCCT model. These blocks were entered into the model in order of causality or theoretical importance (Tabachnick & Fidell, 2007). The criterion to determine whether or not a block of variables will remain in the final model is the Adjusted R Square variable and the Significance of the F Change for each block. An increase in the Adjusted R square along with a p value of less than .05 for the F Change variable led to the block remaining in the model (Garson, n.d.a; Tabachnick & Fidell, 2007). The first block is the person inputs. Person inputs may be one of the strongest predictors of actions, as they will shape contextual affordances and learning experiences, leading to changes in self-efficacy and outcome expectations (Lent et al., 1994, 1996, 1999). Next, a block for self-efficacy is entered, as self-efficacy is modeled to have direct and strong effects on actions (Lent et al., 1994, 1996, 1999). Third, a block of contextual affordances is entered. Finally, a block of learning experiences are put into the

regression model. The criterion variable is the highest grade completed as of the 2005 survey.

Results of Hierarchical Regression

Individuals with Learning Disabilities (LD)

Please see Tables 4.4 through 4.6 for the relevant output for this model. Each block entered into the regression model led to a significant adjusted R square change and significant F change, so the full model will be used to predict highest grade completed (Table 4.4). The full model is significant F (15, 585)=14.7, p<.0005, and accounts for 25.6% of the variance (Table 4.5). Table 4.6 provides results regarding the individual predictor variables in the model. Significant individual predictors in the model include the following: Mental Health Status (β =.083, p=.022), Academic Expectations (β =.133, p<.0005), Biological Mother's Highest Degree (β =.206, p<.0005), Biological Father's Highest Degree (β =.175, p<.0005). Amount Received by Government Programs (β =-.113, p<.0005), and GPA (β =.160, p<.0005). All other individual predictors, which include Sex, Age, Race/ Ethnicity, Income Earned by Participant, Number of Biological Children, ASVAB score, School Fairness, and Proportion of Peers Planning to Go to College were not significant.

Individuals with no Identified Impairment (NI)

Please see Tables 4.7 through 4.9 for the relevant output for this model. Each block entered into the regression model led to a significant adjusted R square change and significant F change (Table 4.7), so the full model will be used to predict the highest grade completed. The full model is significant F (15, 6218)=195.6, p<.0005 (Table 4.8),

and accounts for 31.9% of the variance in the highest grade completed. Table 4.9 provides the results regarding the individual predictor variables in the model. Significant individual predictors include the following: Sex (β =.120, p<.0005), Age (β =.157, p<.0005), Mental Health Status (β =.024, p=.023), Academic Expectations (β =.117, p<.0005), Biological Mother's Highest Degree (β =.194, p<.0005), Biological Father's Highest Degree (β =.099, p<.0005), Income of Participant (β =.-.033, p=.003), Number of Biological Children (β =-.120, p<.0005), Amount Received by Government Programs (β =-.061, p<.0005), ASVAB score (β =.051, p<.0005), GPA (β =.270, p<.0005), and Proportion of Peers Planning to Go to College (β =.022, p=.046). The only individual predictors that were not significant were Race/Ethnicity and School Fairness.

Individuals with other Health and Learning Impairments (OI)

Please see Tables 4.10 through 4.12 for the relevant output for this model. Each block entered into the regression model led to a significant adjusted R square change and significant F change, so the full model will be used to predict the highest grade completed (Table 4.10). The full model is significant F (15, 1915)=57.4, p<.0005, and accounts for 30.5% of the variance in the highest grade completed (Table 4.11). Table 4.12 provides the results regarding the individual predictor variables in the model. Significant individual predictors include the following: Sex (β =.119, p<.0005), Age (β =.132, p<.0005), Mental Health Status (β =.063, p=.001), Academic Expectations (β =.089, p<.0005), Biological Mother's Highest Degree (β =.200, p<.0005), Biological Father's Highest Degree (β =.134, p<.0005), Number of Biological Children (β =-.133, p<.0005), ASVAB score (β =.065, p=.002), and GPA (β =.271, p<.0005). The individual predictors that were not significant include: Race/ Ethnicity, Income of Participant, Amount Received by Government Programs, School Fairness, and Proportion of Peers Planning to Go to College.

Response to research questions

In all three subgroups of individuals with an identified learning disability, individuals without an identified impairment, and individuals with other learning or health impairments the final, full model that matched the SCCT model most closely were the best fit to the data. Therefore, in all three populations, the SCCT model is supported with these data. Therefore, the evidence from this data suggests that the SCCT Career and Academic Choice model predicts the academic achievement of individuals with learning disabilities, individuals with other health and learning impairments, and individuals with no identified impairment or disability.

Comparisons between models

There are, however, a number of areas where individual predictors were significant in one or two subgroups but not in the third subgroup. For all three groups, the predictors of race/ ethnicity and School Fairness were not significant. In terms of the Race/ Ethnicity variables, which were in the first block of predictors, they lost significance as predictors as additional blocks of predictors were entered into the model. Because the School Fairness predictor was added last, it was never significant for any of the subgroups.

For individuals in the LD group, however, there were four nonsignificant variables that were significant in the NI and OI groups. The first is the sex of the individual. For both the group of individuals with no identified impairment and the group of individuals with other health or learning impairments, this was a significant variable. In this case, for both groups, being female led to a higher level of school completion. Age of the participant also was not related to the highest grade completed. This means that older students are no more likely to have a higher level of education than younger students. For the OI and NI group, older participants are more likely to have higher levels of education, which makes sense given the age range of participants when last surveyed in 2005. Participants, when last surveyed, would be between the ages of approximately 21 and 25, a typical age range for young adults to be participating in higher education. ASVAB scores for individuals with learning disabilities also did not predict the highest grade completed. Finally, the number of biological children a participant has did not relate to the highest grade completed for individuals with learning disabilities, although it did for the OI and NI groups.

Discussion

This study provides some initial support for the use of the SCCT model in explaining the academic actions taken by individuals with learning disabilities, as well as for individuals with other impairments and individuals with no identified impairments. Although it is not possible to determine from this analysis which of the blocks of variables is the most important in predicting the academic achievement of the participants, the blocks of person inputs, academic self-efficacy, contextual affordances, and learning experiences all were significant in the final model. Although this study did not include all of the theoretical constructs in the SCCT model, it does provide partial support to the utility of the SCCT model in predicting academic achievement for all students.

A number of the individual variables that were significant in all populations should receive further exploration. For example, in all groups the highest degree

completed by the participant's biological mother and father were significant. In a previous exploration of the SCCT model, this measure was not significant in explanation of college expectations (Ali & Saunders, 2006). However, that study did not look at college performance but expectations of performance. It may be that parental educational level may not impact a student's interest in higher education, but may impact their actions of entering and continuing in education. At least two potential explanations for the significant findings in this study may be possible. Education in this study may be acting as a proxy for family socioeconomic status, which has a link to educational level (US Census Bureau, 2008). It may also be that parental expectations for children's educational attainment may correlate with their own educational levels, and parental expectations and support for education have been hypothesized to influence their children's educational outcomes (Blalock & Patton, 1996; Hogan, Sandefur, & Shandra, 2006; Koehler & Field, 2003).

The findings regarding the differential impacts of age and sex of the participant for individuals with learning disabilities has some support from previous longitudinal research on educational outcomes. It has been hypothesized that students with learning disabilities will take longer than students without a disability to enter postsecondary education (Blackorby & Wagner, 1996). However, findings from this study as well as the only other study to look at graduates more than five years out of college, found that the additional years out of school did not seem to have a large impact on college acquisition in the population of individuals with learning disabilities (Murray et al., 2000). At least two studies have found that females with learning disabilities are less likely to go on in postsecondary education than are males (Rojewski, 1999; Sitlington & Frank, 1990). The

males and females with learning disabilities in this study have almost equal means in terms of highest grade completed (11.59 for males and 11.55 for females). *Limitations*

Learning disability measurements

The largest limitation to this study is the measure of learning disability within NLSY97. The only measure within the instrument is a question asked of the participant's guardian in the first round of surveys. Specifically, the parent or guardian was asked if the participant has a learning or emotional problem that impacts his or her education. This question leaves a lot unanswered. Does the participant have a diagnosed learning disability? Does the participant receive special education services? This limitation is similar to limitations of other large representative data sets, such as the National Educational Longitudinal Study (1988). A review of the disability indicators in NELS found that parental identification of disability was potentially more accurate than other indicators such as teacher identification (Rossi et al., 1997). This indicator also makes it possible to include students with learning difficulties who have not been identified by the school system. However, the use of this measure only leads to difficulty in interpretation and generalization of the results to students with a diagnosed learning disability.

Secondly, the sample of individuals identified as having a learning disability is mixed in with individuals who are identified by their parents as having Attention Deficit Disorder (ADD). Previous research has found a significant co-occurrence of these diagnoses. For example, between 20-40% of individuals with Attention Deficit Hyperactivity Disorder (ADHD) also have a learning disability (Del'Homme, Kim, Low, Yang & Smalley, 2007). This is a significant challenge to these data, as the two

populations, although overlapping, do have different issues. Based on how the question was asked to the parent or guardian, there is no way to separate out the two groups in this study. Therefore, all findings must be tempered with the fact that there is an unknown proportion of this sample that may not identify as having a learning disability, but rather an attention related disorder, or identify as having both diagnoses.

Third, having only one measure of learning disability leaves out the chance for individuals to either receive a later diagnosis of a learning disability, or to have it determined later that the individual does not have a learning disability. A number of individuals will be diagnosed with a learning disability in high school or later, and individuals with higher than typical intelligence scores are also likely to be diagnosed with a learning disability later in their academic career (Ferri, Gregg & Heggoby, 1997; Holliday, Koller & Thomas, 1999; Mellard & Byrne, 1993) Again, this is a limitation with no solution in this study, unless that type of information was gathered along with the transcript analysis and not provided at this time.

A final limitation comes from larger issues about the definition of learning disabilities that are outside of the purview of this study. The definition of learning disability is a topic of much debate. Because IDEA leaves the specifics of determining a learning disability to the school districts, each state or school district may come up with a different set of standards to determine learning disability (Gordon & Lewandowski, 2002; Hallahan & Mercer, 2001; IDEA, 2004; "SLD Determination", n.d.). The learning disability community has also been examining and has come to consensus that alternative measurements for learning disability that follow a Response to Intervention, rather than an Aptitude/ Achievement discrepancy approach, should be utilized (NCRLD, 2007).

Lastly, there is a wide range of types of learning disabilities, with varying impacts, and thus the specific impacts of this diagnosis on the individual may be very difficult to measure. However, the information gathered from this study, with the aforementioned limitations, still has relevance for current practice and policy issues.

Limitations of SCCT model testing using NLSY97

The main limitation to this study is the lack of variables available to test a number of the theoretical constructs used in the SCCT model. For example, there were no questions or measures of outcome expectations regarding educational or employment outcomes obtained for the NLSY97. This led to the testing of only a part of the model, rather than the model in its entirety. Additionally, because there was only one question asked about academic self-efficacy, and it was only asked one time of participants, this is likely an inadequate measure of the participant's academic self-efficacy.

Implications for Practice with Adolescents with Learning Disabilities

Academic self-efficacy

Previous research on academic self-efficacy in adolescents with learning disabilities has shown both that these individuals either miscalibrate their levels of academic self-efficacy, believing themselves to have higher academic skills than they do (Klassen, 2002; Meltzer, Katzir, Miller, Reddy & Rodhti, 2004), or to have lower academic self-efficacy than individuals without a learning disability (Elbaum, 2002; Field, 1996; Lackeye, Margalit, Ziv & Ziman, 2006). This study provides some support to the hypothesis that measures of self-efficacy have a relationship to performance, as students in the LD subgroup, similar to other two subgroups, showed a relationship between believing they were more likely to continue on in schooling and their likelihood of actually continuing on in schooling. Therefore, whether or not academic self-efficacy is accurately representing actual academic ability, it is predicting academic performance, which is consistent with the SCCT model, along with previous research for individuals with learning disabilities.

The SCCT model hypothesizes that an individual's self-efficacy beliefs are indirectly influenced by their person inputs and background contextual affordances, and directly by their learning experiences and outcome expectations. For individuals with learning disabilities, the primary impacts of the disability, which may include academic difficulties, and the secondary impacts of the diagnoses, which may include social skills issues, psychological impacts, and stigma from peers, educators, and family, self-efficacy beliefs, as well as outcome expectations relating to postsecondary education may be negatively impacted. Some studies have shown that learning to contextualize the impacts of the disability and to have a better understanding of the educational accommodations needed may increase students' beliefs in their ability to successfully complete higher education (Cosden & Eliott, 1999; Field, 1996; Goldberg et al., 2003; Skinner & Lindstrom, 2003). Several training programs that focus on self-determination skills for adolescents with learning disabilities do focus on helping the individual have a greater understanding of the impacts of a learning disability and to identify and advocate for appropriate educational accommodations (Field et al., 2003; Griffith & Wade, 2001; Mason & Field, 2004; Weymeyer & Field, 2004).

The importance of research on specific disability categories

Another important finding of this research is that the results for the group of individuals identified with a learning disability are different from those of individuals

identified with another type of learning, physical, or emotional impairment. Although research that looks at individuals with a wide variety of diagnosed disabilities may be important in some areas, it is also important to do separate research on individual disability categories, rather than completing blanket studies comparing individuals with disabilities to individuals without a diagnosed disability. It also points to the need for professionals working with individuals with disabilities to have an understanding of the impacts of specific disabilities to insure that interventions and support are appropriate for their client populations.

Recommendations for Future Research

Future research should explore a number of variables that could not be explored based on the limitations of this dataset. For example, having more explicit questions about career and academic interests, outcome expectations of the student and parents/ guardians of entering postsecondary education and measures of academic self-efficacy as it relates to postsecondary education should be explored.

Other areas of future research may be to look at the way that measures of academic self-efficacy, academic and career interests, and outcome expectations related to postsecondary education, change over time for individuals with learning disabilities as they enter and leave high school and make decisions about postsecondary education. One key aspect of the SCCT model is the ways that career and academic interests and goals change over time. This study did not reflect the changes individuals make over time as proximal and distal contextual affordances, learning experiences, and the maturation process change self-efficacy and outcome expectations, leading to changes in interests, goals and actions (Brown & Lent, 2006; Lent et al., 1994, 1996, 1999).

Table 4.1Means and Standard Deviations of Dependent Variable, Self-Efficacy Measure And

	LD Mean	LD SD	NI Mean	NI SD	OI Mean	OI SD
Highest Grade	11.58	2.14	12.75	2.42	12.64	2.41
Completed						
Academic	37.1	38.1	44.8	38.3	44.1	38.1
Expectations in						
Five Years						
Mental Health	15.0	2.80	15.4	2.50	15.2	2.60
Scale						
Age (12/31/96)	13.9	1.40	14.0	1.40	14.0	1.43

Demographic Variables

Table 4.2

Means and Standard Deviations of Proximal and Distal Contextual Variables

	LD Mean	LD SD	NI Mean	NI SD	OI Mean	OI SD
Highest Degree	3.05	1.38	3.13	1.38	3.20	1.31
Mom						
Highest Degree	3.00	1.33	3.22	1.50	3.22	1.43
Dad						
Earned Income	13500	10700	14800	11600	14400	10800
Amount	433	1530	337	1280	417	1420
Government						
Assistance						
Number of Bio	.300	.677	.350	.743	.360	.755
Children						

Table 4.3

Means and Standard Deviations	of Learn	ning Experience	Variables
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	LD Mean	LD SD	NI Mean	NI SD	OI Mean	OI SD		
Overall GPA	2.53	63.3	2.84	.610	2.84	.610		
ASVAB Score	45.0	29.0	44.5	29.0	47.8	29.4		
School	11.0	2.10	11.1	2.10	11.1	2.13		
Fairness								
Educational	5.00	9.60	5.20	7.50	5.27	7.40		
Vocational								
Support								
Hierarchical Re	pression M	odel: Individi	tals with Learn	ine Disabili	ities (LD)			
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	×	R	Adjusted R	0 [34]	df 1	df 2	Sig. F Change	Durbin-
		Squared	Squared	Change				Watson
Model 1	.217	.047	.039	5.89	5	595	<.0005	
Model 2	.311	760.	.088	32.8		590	<.0005	
Model 3	.495	.245	.231	23.0	S	589	<.0005	
Model 4	.524	.274	.256	5.94	4	585	<.0005	1.98
Model 1 Variab Health	les: Sex, Af	frican Americ	an/ Black, Hisp	anic/ Latinc) (Non Bla	ck/ Non H	ispanic as reference ca	ttegory), Mental
Model 2: Variat Health, School e	les: Sex, A xpectation	frican Ameri (% Chance w	can/ Black, His ill be in school	panic/Latin in 2005)	o (Non Bla	ick/ Non H	lispanic as reference c	ategory), Mental
Model 3 Variab Health, School e Achieved by Bid	les: Sex, Af xpectation ological Fat	frican Americ (% Chance w ther, Income,	an/ Black, Hisp ill be in school Number of Bio	anic/ Latinc in 2005), H logical Chil	o (Non Bladighest Deg dren, Amo	ck/ Non H ree Achiev unt of Gov	ispanic as reference ca ved by Biological Mo vernment Assistance	tegory), Mental her, Highest Degree
Model 4 Variab Health, School 6 Achieved by Bid School Fairness	les: Sex, Al expectation slogical Fat Scale, % or	frican Americ (% Chance w ther, Income, f Peers Going	an/ Black, Hisp rill be in school Number of Bio to College	anic/ Latinc in 2005), H logical Chil	o (Non Blad lighest Deg dren, Amo	sk/ Non Hi ree Achiev unt of Gov	ispanic as reference ca ved by Biological Mot vernment Assistance, (ttegory), Mental her, Highest Degree 3PA, ASVAB Score,

Table 4.5

ANOVA Table of Final Regression Model for Individuals with Learning Disabilities (LD)

	Sum of Squares	df	Mean Square	ц	Sig.
Regression	768.348	15	51.223	14.734	<.0005
Residual	2033.805	585	3.477		
Total	2802.153	600			

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	t Significance	5.44 <.0005	1.04	1.48 .138	.956	.697 .486	2.30 .022	3.61 <.0005	4.89 <.0005	4.16 <.0005	1.66 .097	.662 .508	2.97	1.81 .071		4.41 <.0005	4.41 <.0005 .429 .668	4.41 <0005 .429 .668	4.41 <.0005 .429 .668 .008 .994
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	Standardized Coefficient Beta		.040	.055	039	.028	.083	.133	.206	.175	062	027	113	.072	.160		016	016	016
cients	Std. Error	1.05	.178	.057	.201	.243	.029	.002	.066	.068	000 [.]	.130	000	000	.001		.037	.037	.037 .075
Unstandardized Coeffi	B	5.70	.187	.085	198	.170	.067	.008	.322	.282	-1E-005	086	000	5.5E-006	900.		016	016	016 .001
		Constant	Sex	Age	Black	Hispanic	Mental Health	% Chance in School	Degree Mom	Degree Dad	Income	# Bio Children	\$ Government	ASVAB	GPA		School Fairness	School Faimess	School Fairness % Peers go College

	×	R	Adjusted R	ſĿ,	df 1	df 2	Sig. F Change	Durbin-
		Squared	Squared	Change				Watson
Model 1	.259	.067	.066	89.5	5	6228	<.0005	
Model 2	.329	.108	.108	289	1	6227	<.0005	
Model 3	.504	.254	.253	242	S	6222	<.0005	
Model 4	.566	.321	.319	152	4	6218	<.0005	1.77
Model 1 Vari Health	ables: Sex, /	African Americ	:an/ Black, Hisp	anic/ Latino	(Non Bla	ick/ Non Hi	spanic as reference c	ategory), Mental
Model 2: Var Health, Schoo	iables: Sex, ol expectatio	African Ameri n (% Chance v	ican/ Black, His vill be in school	panic/Latin in 2005)	o (Non Bl:	ack/ Non H	ispanic as reference (category), Mental
Model 3 Vari Health, Schoc Achieved by	ables: Sex, / ol expectatio Biological F	African Americ n (% Chance v ather, Income,	can/ Black, Hisp vill be in school Number of Bio	anic/ Latino in 2005), H logical Chilo) (Non Bla ighest De _i dren, Amo	tck/ Non Hi gree Achiev wunt of Gove	spanic as reference c ed by Biological Mo ernment Assistance	ategory), Mental other, Highest Degree

Achieved by Biological Father, Income, Number of Biological Children, Amount of Government Assistance, GPA, ASVAB Score, Health, School expectation (% Chance will be in school in 2005), Highest Degree Achieved by Biological Mother, Highest Degree Model 4 Variables: Sex, African American/ Black, Hispanic/ Latino (Non Black/ Non Hispanic as reference category), Mental School Fairness Scale, % of Peers Going to College

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	Sum of Squares	df	Mean Square	Ĩ	Sig.
Regression	11767.640	15	784.509	195.628	<.0005
Residual	24935.485	6218	4.010		
Total	36703.125	6233			

	Unstandardized Coeffici	ents			
	В	Std. Error	Standardized Coefficient Beta	ţ	Significance
Constant Sex	2.37 .583	.383 .055	.120	6.18 10.7	<:0005 <:0005
Age	.273	.019	.157	14.1	<.0005
Black	018	.067	003	270	.787
Hispanic	.046	.071	.008	.650	.516
Mental Health	.024	.011	.024	2.28	.023
% Chance in School	.008	.001	.117	10.5	<.0005
Degree Mom	.343	.024	.194	14.4	<.0005
Degree Dad	.159	.022	660.	7.37	<.0005
Income	-7E006	000	033	-2.99	.003
# Bio Children	397	.042	120	-9.56	<.0005
\$ Government	000	000	061	-5.05	<.0005
ASVAB	4.51E006	000	.051	4.31	<.0005
GPA	.011	000	.270	23.5	<.0005
School Fairness	.005	.013	.005	.431	.666
% Peers go College	.049	.025	.022	2.00	.046

Coefficients for the Final Model for Individuals with No Impairment (NI)

Hierarchical Re	gression M	lodel: Individ	uals with Other	Impairmen	ts (OI)			
	R	R	Adjusted R	ы	df 1	df 2	Sig. F Change	Durbin-
		Squared	Squared	Change				Watson
Model 1	.221	.049	.046	19.7	5	1925	<.0005	
Model 2	.294	.087	.084	80.2	1	1924	<.0005	
Model 3	.488	.238	.234	76.2	S	1919	<.0005	
Model 4	.557	.310	.305	50.1	4	1915	<.0005	1.88
Model 1 Variab Health	les: Sex, Ai	frican Americ	an/ Black, Hisp	anic/ Latinc) (Non Blac	k/ Non His	spanic as reference c	ttegory), Mental
Model 2: Varial Health, School	oles: Sex, A expectation	frican Ameri (% Chance w	can/ Black, His vill be in school	panic/ Latin in 2005)	o (Non Bla	ck/ Non Hi	spanic as reference c	ategory), Mental
Model 3 Variab Health, School (Achieved by Bid	les: Sex, Al expectation ological Fat	frican Americ (% Chance w ther, Income,	an/ Black, Hisp ill be in school Number of Bio	anic/ Latinc in 2005), H logical Chil	o (Non Blac ighest Deg dren, Amou	k/ Non His ree Achiev unt of Gove	panic as reference co ed by Biological Mo ernment Assistance	itegory), Mental ther, Highest Degree
Model 4 Variab Health, School (Achieved by Bid School Fairness	les: Sex, Al expectation ological Fat Scale, % o	frican Americ (% Chance w ther, Income, f Peers Going	an/ Black, Hisp vill be in school Number of Bio to College	anic/ Latinc in 2005), H logical Chil) (Non Blac ighest Deg dren, Amou	:k/ Non His ree Achiev unt of Gove	panic as reference ca ed by Biological Mo ernment Assistance, (ttegory), Mental ther, Highest Degree 3PA, ASVAB Score,

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df Mean Square F Sig.	15 228.784 57.398 <.0005	1915 3.986	1930
df	15	1915	1930
Sum of Squares	3431.757	7633.013	11064.771
	Regression	Residual	Total

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	Unstandardized Coe	fficients			
	B	Std. Error	Standardized Coefficient Beta	tt.	Significance
Constant	1.76	069.		2.55	.011
Sex	.568	.097	.119	5.86	<.0005
Age	.223	.034	.132	6.51	<:0005
Black	.155	.121	.027	1.27	.203
Hispanic	.051	.134	.008	.380	.704
Mental Health	.061	.019	.063	3.28	.001
% Chance in School	900.	.001	.089	4.38	<:0005
Degree Mom	.364	.042	.200	8.70	<:0005
Degree Dad	.225	.039	.134	5.80	<:0005
Income	-5E-007	000	002	121	.903
# Bio Children	423	.073	133	-5.83	<.0005
\$ Government	-7E-005	000	041	-1.86	.063
ASVAB	5E-006	000	.065	3.08	.002
GPA	.011	.001	.271	13.4	<:0005
School Fairness	.027	.022	.024	1.24	.216
% Peers go College	.056	.045	.025	1.24	.215

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CHAPTER FIVE

CONCLUSION

Summary of Manuscripts

The most consistent finding throughout this dissertation is the slow advances for adolescents and young adults with learning disabilities in the context of higher education. Although the number of individuals with learning disabilities has increased greatly in higher education settings over the past 20 years (Henderson, 2001), the numbers of graduates of higher education does not appear to be increasing at the same rate (Blackorby and Wagner, 1995; McAllister, 2008; Murray, Goldstein, Nourse & Edgar, 2000; Sitlington & Frank, 1990; Rojewski, 1999; Wagner et al., 1991; Wagner et al., 2005). Two findings from this study, in particular, emphasize this conclusion. The first is that persons with learning disabilities, as recently as 2005, continue to have a significantly lower rate of high school graduation and postsecondary enrollment than both individuals without an identified disability and individuals with other learning or physical impairments. The other finding is that the age of the individual with an identified learning disability does not have a relationship to their educational level in this study. Whereas the number of years of schooling increases for older participants in the other two subgroups, older participants with learning disabilities have approximately the same level of education as younger participants.

The current research on learning disabilities does provide a number of ideas to support adolescents with learning disabilities towards a goal of postsecondary education, and the evidence presented supports the benefit of practices such as: (a) self-

determination training (Field, 1996; Field & Sarver, 2003); (b) inclusion in general education programs (IDEA 2004; McLeskey, Henry, & Axelrod, 1999; Wagner et al., 2003; Wehmeyer & Field, 2004); (c) providing vocational training and preparation in high school (Benz, Lindstrom, & Yovanoff, 2000; Evers, 1996; Griffith & Wade, 2001; Wagner, Newman & Cameto, 2004) (d) social skills training and support (Bender, 2004; Bryan & Burstein, 2004; Cartledge, 2005; Elias, 2004; Garrett, 2005; Kavale & Mostert, 2004; Mishna & Muskat, 2004; Raines, 2006); and (e) transition planning that begins in early high school, actively involves the student in the process, and leads to informed and prepared students and families for the challenges and changes in environment that postsecondary education brings (Babbit & White, 2002; Brinkerhoff, 1996; Field & Sarver, 2003; Gil, 2007).

This study also supports the use of the Social Cognitive Career Theory as a model for explaining academic achievement in individuals with learning disabilities, as well as in individuals with no identified impairment and individuals with other impairments than a learning disability. A number of areas should be considered when thinking about the SCCT model in regards to academic performance. First, the importance of academic selfefficacy beliefs towards academic goals and actions (Bandura, 1986; Lent, Hackett & Brown, 1994, 1996, 1999) is reinforced by this study. As self-efficacy is directly impacted by the learning environment, and indirectly by person inputs and contextual affordances (Brown & Lent, 2006; Lent et al, 1994, 1996, 1999), an examination of the ways this may lead individuals with learning disabilities to have low academic selfefficacy beliefs is important. Inclusion in general education classrooms, for example, may lead students with learning disabilities to believe that they will be capable of

postsecondary education, for example. Having "mastery experiences" (Bandura, 1986, Lent et al., 1999) that provide positive educational or prevocational experiences, or having role models of individuals with learning disabilities who have successfully completed postsecondary education may also lead individuals with learning disabilities to believe that they are capable of postsecondary education may be important as well.

The SCCT model theorizes that self-efficacy beliefs are indirectly, not directly related to person inputs and background contextual affordances via the learning experience of the individual. It is possible, however, that academic self-efficacy may be directly, as well as indirectly, affected by person inputs for individuals with learning disabilities more so than for other groups of students. For example, if persons with learning disabilities, based on errors or deficits in metacognition, do miscalibrate their academic self-efficacy levels as is posited by Klassen (2002), then it may not be adequate to provide a supportive and inclusive learning environment in high school. In line with the benefits of understanding, accepting, and learning to compartmentalize disability (Higgins & Raskind, 2002; Stewart, 1999), it may be important for educators and families to assist the individual with a learning disability to see their academic strengths and challenges in a more realistic fashion (Cosden & Eliott, 1999; Field, 1996; Goldberg et al., 2003; Skinner & Lindstrom, 2003). Perhaps if the adolescent with a learning disability can accurately perceive his or her academic skills and deficits while in high school, he or she can have more time to learn what accommodations and learning techniques can be most effective before entering college. Ultimately, having accurate academic self-efficacy beliefs may increase the likelihood of students with learning

disabilities choosing postsecondary environments that will emphasize their strengths and support their area of learning needs.

Implications for Social Work Practice

On a daily basis, social workers, based on our many roles in human service systems, work with individuals with a wide variety of disabilities. This may occur by mandate, such as in school districts or mental health settings, where issues related directly to the disability may be the focus of treatment, or in agencies where services may be indirectly related to or independent of the individual's particular disability (Beaulaurier & Taylor, 2001; Jonson-Reid, Kontak, Citerman, Essma & Fezzi, 2004; Quinn, 1995). Within all of these settings, social workers will work with individuals with learning disabilities.

In order to work more effectively with individuals with learning disabilities, the social worker needs to start by asking questions regarding disabilities in assessment and treatment. This may be as simple as asking the client and his/her family if he/she has ever been diagnosed with a learning disability. Even if the social worker is not familiar with the particular assessment techniques for learning disability, he/she can assess for the potential impacts the individual identified with a learning disability might be experiencing, such as educational or vocational issues, social skills issues, or emotional impacts. It is also important that social workers in all settings be prepared to assess the potential psychosocial impacts of having a learning disability and work with the client to understand the impact of disability discrimination and acceptance of disability on the individual and his/ her systems (Beaulaurier & Taylor, 2001; Gilson & DePoy, 2002; Mackelprang & Salsgiver, 1996, 1999).

The findings of this dissertation also have relevance for social work practice with adolescents with learning disabilities and their families. For example, having knowledge of the educational level of the adolescent's parents may assist the social worker in their assessment of the family support the adolescent may have towards postsecondary education. Because learning disabilities appear to have genetic or biological components, an adolescent with a learning disability is more likely to have a parent or sibling with a learning disability or with ADHD (Del'Homme, Kim, Loo, Yang & Smalley, 2007). Therefore, the family may experience disability within more than one member of the family, potentially leading to higher levels of stress for all family members or to multigenerational discrimination on the basis of disability diagnoses.

Finally, social workers in a wide variety of fields should be prepared to work on goals such as self-determination and empowerment when working with adolescents with learning disabilities. Social workers can enable the adolescent and his or her family to view and enhance the strengths and skills the adolescent possesses. Even if the social worker is not working within the educational system, he or she could work with the adolescent towards educational and/ or vocational goals. Self-determination, social skills, independent living skills and strengths based interventions can be provided in a wide variety of settings, with a goal of supporting the adolescent to make and carry out plans leading to academic and vocational success. Social workers may also encourage adolescents with learning disabilities to explore the range of postsecondary educational environments available, including four-year colleges, community/ junior colleges, and professional/ trade schools to find the best fit and support before the student leaves high school.

Implications for Social Work Education

In order to empower individuals with learning disabilities to reach their educational, vocational, and other goals, it is important that social workers gain a stronger understanding of this diagnosis, and particularly how it impacts individuals in adolescence and young adulthood in relation to educational and career-related goals. Although it is important to understand the issues and impacts of having a disability in general (Gilson & DePoy, 2002; Mackelprang & Salsgiver, 1996, 1999), and that each person will be uniquely impacted by his or her disability diagnosis, there are common traits and challenges that are shared by many individuals with learning disabilities and other specific disabilities. As this study emphasizes, looking at persons with disabilities as a group may lead students and practitioners to overlook the particular strengths and challenges of people in particular disability categories. It is important that social work education helps students see the way that a specific disability diagnosis impacts the system of the individual with a learning disability on multiple levels, and ways that social workers can team with the individual with a learning disability to improve their personin-environment fit.

Yet social work education has not emphasized work with persons with disabilities in general, or with persons with specific disabilities in particular (Galambos, 2004; Kirlin, 1986; Gilson & DePoy, 2002). This may lead social work students to perpetuate stereotypical thinking about individuals with disabilities. In addition, a number of social work roles continue to emphasize the medical model of disability, which emphasizes "curing" the individual, rather than making changes at multiple systems levels and focusing on individual strengths (Hahn, 1999). This continued deficit based perspective

on disability leads many persons with disabilities to feel distrust and animosity towards social workers (Beaulaurier & Taylor, 2001; Gilson, Bricourt & Baskind, 1998). Strengths based, empowering practices with persons with disabilities starts with an educational foundation on work with persons with disabilities. Integrating content about practice with individuals with disabilities can be done in almost all areas of social work class content. Helping social work students see the ways that systems oppress and discriminate against persons with disabilities, and to look at disabilities (Mackelprang & Salsgiver, 1996, 1999). A number of lesson suggestions and plans, course syllabi for required and elective courses with disability content, and textbooks on social work practice with persons with disabilities are available (Gilson & DePoy, 2002; Gilson, MacDuffie & Meyershon, 2002; Liese, Clevenger, & Hanley, 1999; Mackelprang & Salsgiver, 1996, 1999).

Implications for Future Research

The findings of this study, and the limitations of the data available for this study, lead to a number of potential areas of future research. The NLSY97 dataset does have a major limitation in the area of disability identification, in general, and learning disability identification in particular. On the other hand, the data analysis done for this study provides evidence that the sample of individuals identified as having a learning disability may have a significant overlap with other populations of individuals identified with a learning disability. For example, the educational outcomes, proportion of males and females, and employment outcomes are similar in this sample to samples of individuals with learning disabilities in other studies (Blackorby and Wagner, 1995; Murray et al.,

2000; Sitlington & Frank, 1990; Rojewski, 1999; Wagner et al., 1991; Wagner et al., 2005) With that in mind, future research looking at educational outcomes as the NLSY97 sample ages would be an important addition to the limited longitudinal data available on individuals with learning disabilities. It may also be useful to look at the vocational trajectories and incomes of individuals with learning disabilities using this dataset. One of the strengths of this dataset is that it measures each job the individual has engaged in each year. These data could be used to look at the types of professions and incomes individuals with learning disabilities enter or transition into over time.

Future testing of the SCCT model as it applies to individuals with learning disabilities should also be completed. For example, tests of individual relationships between some of the SCCT constructs as they relate to individuals with learning disabilities may help practitioners find new ways to assist this population. Future testing of the SCCT model may also look at the changes in measurements such as self-efficacy and outcome expectations for students with learning disabilities during their final years of high school and their first years out of high school. Do self-efficacy and outcome expectations decrease when the individual takes high school exit exams? What kinds of transition planning and interventions best support goals of higher education? What is the link between self-efficacy, outcome expectations, and self-determination training, for example?

Finally, it is important to add to the research done on students with learning disabilities who are currently in college. For example, are there different postsecondary success rates for individuals who are diagnosed with a learning disability in college versus being diagnosed before college? One study found that over one third of students

with learning disabilities in that college setting were not diagnosed until college (Ferri, Gregg, & Heggoby, 1997). What makes these populations of students similar or different from each other? Another area of research is to look at college persistence and learning disability. What factors lead a student with a learning disability to persist and succeed in postsecondary education? What can be learned from individuals with learning disabilities that are successful in college that can be used to assist other individuals with learning disabilities? Some of the factors that could be explored are individual variables such as self-efficacy levels, outcome expectations, and other types of person inputs. Other variables that might be explored include family systems, educational and vocational experiences in high school, and perceptions of the college learning environment.

Since the IDEA amendments of 1997, smooth and successful educational and vocational transitions have been emphasized for individuals with disabilities in the public school system. At this point, however, the emphasis on transition planning does not seem to have a significant impact on the educational outcomes for individuals with learning disabilities. Higher education is more important than ever for financial independence and stability. It is important to continue to research the factors impacting these educational disparities and to seek intervention strategies at the individual, family, and educational systems levels to support individuals with learning disabilities in higher education.

Addendum: Reflections on a Multiple Manuscript Dissertation

As this is my first and last dissertation, it is impossible to compare all of the pros and cons of completing a dissertation as a series of manuscripts versus one integrated paper. I can give several reflections on this process, however. First, I can say that separating the work of the dissertation writing was easier than I would have imagined. Although these three papers overlap each other, I was able to see them as distinct pieces of work with different structure, audience, and goals. One challenge of trying to write three concise pieces for publication, however, was trying to balance brevity with the desire to express what I had learned. For example, Chapter Two includes a discussion of the implications for social work practice in a variety of practice settings. If I were sending this manuscript out for potential publication, however, I would likely focus the discussion more on one area of practice. I also provide more tables in Chapters Three and Four than would ever be allowed in a publication, because I wanted to make the process of analysis clear. Overall, I can say that this was a good choice for me, and provided me with more chances to write in a manner consistent with writing for potential publication.

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Appendix A: IRB Approval



Certification for use of an approved public data file

December 3, 2007

To: Rena Harold 232 Baker Hall College of Social Science

Re: Certification # PD07-013

Title: Variable Affecting the post-school outcomes of students with learning disabilities

Thank you for submitting your certification for the use of an approved public data file. The Social Science / Behavioral / Education Institutional Review Board (SIRB) has received and accepted your certification.

You may conduct this research project using the approved data file until its completion without any further review from the SIRB. If your project expands to include human subjects or identifiable data from human subjects you will have to submit a complete application to SIRB.

In the future, if you wish to conduct another project, not directly related to this project, or use another approved data file not listed on this certification, please submit another certification form. This will allow you to continue your work without IRB review. In addition, the certification allows us to keep a total of all human research being performed and gives credit to you and your department in any reports or statistics.

Please use the certification number listed above on any forms submitted which relate to this project, or on any correspondence with SIRB.

Thank you for your cooperation and good luck with your research. If we can be of further assistance, please contact us at 517-355-2180 or via email at <u>IRB@msu.edu</u>.

Sincerely.

Ps/-Q

,

Peter Vasilenko Director, Human Research Protection Program



OFFICE OF REGULATORY AFFAIRS Human Research Protection Programs

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