COLLEGE STUDENTS WITH LEARNING DISABILITIES IN MATHEMATICS:

ARE THEY STRUGGLING TO ACHIEVE IN THE POSTSECONDARY

EDUCATIONAL SETTING

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According to the U.S. Department of Education (2002), there are approximately 1,669,000 students with disabilities at the postsecondary educational setting. Of these, 29.4% have an orthopedic or mobility impairment, 17.1% have a mental illness, 15.1% have a systemic illness or impairment, 11.9% have a visual or hearing impairment, 6.4% have attention deficit/hyperactivity disorder, and 5.0% have a learning disabilities. While there are approximately 75,000 with learning disabilities or attention deficit/hyperactivity disorder, current research has focused on students with learning disabilities as a homogenous group.

There is limited research on how well students with learning disabilities in mathematics achieve academic success at the postsecondary level.

This study will examine academic achievement scores for a group of 70 college students with diagnosed learning disabilities in mathematics attending a south-central, public, four-year university between 2000 and 2004. Using an *ex post facto* or retrospective study design for Phase I of the study, students with learning disabilities in mathematics will be compared to the universities general undergraduate student population. Analysis will also be conducted to determine if differences exist between students with only a mathematics disorder and those with mathematics and additional learning disabilities. Relationships will be examined between (a) demographic characteristics (age, gender, and race), (b) overall college Grade Point Average, (c) overall math course Grade Point Average, and (d) ACT Composite and ACT Math scores. Qualitative and quantitative methods of data gathering will be used as a follow-up to help explain and give meaning to the initial results in Phase I. This study will also examine and compare the convergent and discriminate validity of the Self-Efficacy Scale (SES) and the Social Adjustment Scale II (SAS-II).

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CHAPTER ONE
Introduction

While the Rehabilitation Act of 1973 gives individuals with disabilities the right to receive vocational services, it does not mandate that universities and other postsecondary educational institutions provide such services. Despite the fact that many universities do refer students with disabilities to their local vocational rehabilitation representative to acquire additional services, there are currently no best practice standards for doing so. Thus, many students with disabilities are left to get by on their own, struggling to sort through the bureaucracy of the service industry.

Peterson (1999) stated that "today's workers are expected to handle more pressure, more change, more technology, and more communication" in the work place than in previous decades. Individuals with disabilities must face these same environmental pressures as the nondisabled community, but will require support to be able to achieve equal success in the workplace. Postsecondary institutions recognize this fact, but few provide the necessary interventions to disabled students to help them succeed in the workplace.

Gartin, Rumrill and Serebreni (1996) defined a three-part higher education transition model to help students with disabilities move successfully from postsecondary education to employment. The authors believe that the college environment provides a transition from adolescence to adulthood and that many social and problem-solving skills must be developed to make this transition successful; however, because of the increased pressures and stress faced by students with disabilities, they are unable to acquire these skills. Gartin, Rumrill, and Serebreni's transition model focused on psychosocial adjustment, academic

development, and college to community orientation. Students, both disabled and nondisabled, must learn to become more independent, participate in social and recreation activities, and learn to build and maintain relationships with other adults.

In the past decade, college students with disabilities have been receiving increased attention. The majority of literature and research on college students with disabilities has grown exponentially, covering a wide range of related topics. Research has focused on the effects of cognitive and affective variables on college performance, faculty and advisors willingness to accommodate college students with disabilities, and college students with learning disabilities as a homogenous group. However, there has been limited research in regards to specific learning disabilities and their impact on academic achievement, as well as the impact of current standard reasonable accommodations on the success of these students. The purpose of this study will hopefully begin to bridge this information gap so that service providers at postsecondary institutes will begin to understand how students with learning disabilities in mathematics and reading are different than the non-learning disabled college student population, as well as to determine if the students find their academic accommodations to be beneficial.

CHAPTER TWO
Review of the Literature

Transition Services

Theoretical Background

While the United States Congress has passed mandates for secondary educators to provide transition services to students with disabilities, there is no such mandate requiring post-secondary educators to do the same. Dalke and Schmitt (1987) identified four main reasons to support the need for post-secondary education transition services. These reasons include (a) "teacher-student contact decreases drastically," (b) "academic competition becomes greater," (c) "disabled students experience a change in their personal support network," and (d) "disabled students move from an environment wherein they are carefully guided and individually instructed to a setting wherein they are expected to achieve on their own" (pp. 176-177). While taking into consideration such recommendations, Siperstein (1988) developed the Three-Stage Transition Model (TSTM) to help guide disability service providers and meet the needs of students with disabilities at the post-secondary education setting.

The TSTM emphasizes the need for ongoing support for students with disabilities throughout their post-secondary education. The first stage of the model focuses on (a) supporting the interest in college and (b) developing an individualized college plan. As the student with a disability enters college, Siperstein (1988) states that disability support services and educators must help the student stay interested in college and in attending their college classes. While students with disabilities face the same reasons for not attending class

as their non-disabled peers (i.e. lack of motivation, class difficulty, fear of failure, etc.), the student's disability has additional implications, affecting their decisions for attending class. By developing an Individualized College Plan (ICP), similar to the Individualized Education Plan (IEP) created in grade school, disability support services can help the student identify potential problems, plan for the future, and reduce the potentially troublesome reasons for not attending class and/or dropping out of college.

The second stage emphasizes that students with disabilities need additional classroom support and additional skills acquisition to succeed in the post-secondary setting. All federally funded colleges and universities are required to provide services to students with disabilities; however, these services typically only include providing standard classroom accommodations such as alternate text formats, note-takers, readers or scribes, and additional test time. Siperstein (1988) believes that students with disabilities also need the opportunity to develop their non-academic skills. Such skills include compensatory strategies, problem-solving and conflict resolution, as well as social competency, functioning, and coping skills. This stage also emphasizes the need for faculty awareness and faculty training, so that professors will be able to provide the best teaching environment and adequate resources for students with disabilities.

Palmer and Roessler (2000) conducted an evaluation of the Self-Advocacy and Conflict Resolution Training (SACR) program which sought to help college students through Siperstein's second stage. The goal of the SACR program was to "provide the tools to resolve the inevitable differences of opinion that occur in the absence of clear accommodation policies" (p.39), focusing on communication and negotiation skills to

promote the students overall level of self-advocacy and ability to resolve conflicts. The training program required eight hours of participation and examined 24 behaviors associated with self-advocacy.

Fifty students who were eligible for academic accommodations were recruited from two-year and four-year postsecondary institution's disability services. Using an experimental design, participants were randomly assigned to a treatment group that went through the SACR program and a control group that did not participate in the SACR program. The study utilized a mixed method form of data gathering using both qualitative and quantitative measures of outcome. Statistical analysis showed that the treatment group improved significantly when compared to the control group on number of self-advocacy behaviors, amount of general knowledge of accommodation rights and responsibilities, self-efficacy in requesting accommodations, and resolving conflicts associated with those requests.

The third and final stage of the TSTM focuses on the chief and primary concern of most vocational rehabilitation professionals, career awareness. Siperstein's model differentiates itself from other transition models by the inclusion of this third stage. The TSTM indicates that there is a need to assess, identify and incorporate an individual's career and vocational preferences into their individualized college plan. By doing so, the student and faculty advisor can tailor the student's academic coursework to meet the desired vocational outcomes, leading to more timely post-graduation employment, tailored vocational skills, and higher degrees of vocational satisfaction and retention. The third stage is based on basic vocational choice assumptions including (a) where is the student now, (b) where does the student want to be in the future, and (c) what does the student need to do to

achieve their desired goal. Such assumptions are the foundation for setting any vocational goal, and achieving a "best-fit" vocational choice.

Siperstein's third stage corresponds to and incorporates Thompson and Hutto's (1995) Employment Counseling Model. Thompson and Hutto state that there is first a need to assess the career development needs of the individual and then focus on helping the individual acquire the skills necessary to achieve their career goal. Badger (1999) explained that individuals with disabilities tend to share two common career beliefs, either they have a stereotypical job which their family believes they can do or the individual feels there are too few career options or are no career options. The process defined by the Employment Counseling Model seeks to improve these limited career outcome views. It also points out the need to help the individual become more familiar with their rights under the ADA and how one should go about asking for reasonable accommodations.

Following a person-centered approach, Badger (1999) highlights several key factors to be used in employment counseling. These factors include: (a) what the student needs to know about the job so that they can request the appropriate accommodations, (b) the student needs to know another individual with a disability who has succeeded in the same job, (c) student needs to gain experience while in college to increase their skills, (d) need to know when to disclose their disability, and (e) the student needs to learn to become their own public relations expert, understanding how to describe their disability in a positive way to employers, problem-solving, and self-advocacy. Table 1 shows a breakdown of the three categories and possible interventions which Mitchell, Browdin, and Beniot (1990) believe students with disabilities typically belong.

Table 1
College students with disabilities in relation to self-efficacy, outcome expectations, and possible interventions.

	Student Attributes	Possible Interventions
Category 1	Confident in ability to perform, good study habits, attends class regularly, keeps up with school work, and makes good grades	Resume and cover letter development, interview skills, disability reduction skills, conducting informational interviews, practicing interviews, advice about clothing, and training in maintaining eye contact
Category 2	Believe they will not be able to find a job after graduation, procrastinates in pursuing a real job search, and tends to remain in school as long as possible	Contact with role models, mentoring programs, informational interviews, contacts with the employment community, student work programs, part-time work, and volunteer work
Category 3	Unaware of the behaviors essential to achieving success in college and on-the-job, little study skills, difficulty selecting a major or selecting appropriate course for a major	Access to additional tutoring, expanded awareness of occupational choices, structured study habits, task and time management, decision-making skills, opportunities for self-discovery, and social integration with nondisabled peers

**Mitchell, Brodwin, and Beniot (1990) as reported in Thompson and Hutto (1995)

Mitchell, Browdin, and Beniot breakdown was influenced primarily through the work of Albert Bandura on self-efficacy and outcome expectations and his Social Cognitive Career Theory.

The Social Cognitive Career Theory is another contribution to the third stage of Siperstein's TSTM. In the Social Cognitive Career Theory (SCCT) model, Lent, Brown and

Hackett (2000) explain that "a complex array of factors such as culture, gender, genetic endowment, sociostructural considerations, and disability or health status operate in tandem with people's cognitions, affecting the nature and range of their career possibilities" (p.256). Similar to the cognitive-behavioral model, the SCCT builds on the fact that individuals experience life differently, primarily because they are influenced by external stimuli differently. Even though two individuals may experience the same or similar external stimuli, their thoughts related to the event will be different, thus giving each individual a different perceived experience. For those individuals with disabilities, this is a very important aspect of the model because many of these individuals face many negative external stimuli, such as discrimination and/or prejudice, and if these individuals experience these events as "negative," their experience will be a lot different than an individual who perceived the event as "positive." In the SCCT, these events are considered "learning experiences," the first stepping-stone to career development.

The next stepping-stone in the SCCT is divided into two, self-efficacy and outcome expectations. Depending on how an individual perceived their life experiences related to their disability, which of course then influenced their "learning experience," the individual would have different levels of self-efficacy and different perceived outcome expectations. A disabled individual, who experienced all of their life experiences as negative, would more likely have lower self-efficacy and more negative outcome expectations than an individual who perceived their life experiences positively. Bandura (1986) defined self-efficacy as "people's judgment about their capabilities to organize and execute courses of action required to attain designated types of performances" (p.391). Assuming this definition is

correct, individuals with disabilities who had those negatively perceived experiences would therefore most likely have low self-efficacy and low motivation, and because they would tend to believe that the barriers to attaining employment are too formidable.

When one examines the four sources of self-efficacy more closely (performance accomplishments, vicarious learning, verbal persuasion and physiological arousal) for a given individual with a disability, then we can better explain their current levels of self-efficacy and motivation. To give a brief example, if an individual acquires a disability and has never seen an individual with a disability working, then they may perceive themselves as not being able to work. However, if the same individual has accomplished or experienced employment and personal success, then they may view themselves as being able to return to work. One might say that career development is all about perception and performance, and nothing else matters.

In an effort to improve students with disabilities career self-efficacy and outcome expectations, Kachgal and Petrich (1999) created the Access to Work project. The project was "designed to deliver comprehensive, flexible, and individually-based career development and assessment services" (p.3). Using the student population at the University of Minnesota, the authors identified several important factors which are similar to Mitchell, Browdin, and Beniot (1990) and Badger (1999). They found that students with disabilities had very little knowledge of the ADA and how it applies to them, the students were confused as to when they should disclose their disability, and the students had limited or no work experience which made career choices more difficult. The Access to Work program sought to incorporate the person-centered approach and skill-building approach to improve the

deficiencies found as students enrolled in the program. After using service learning and internship experiences, as well as workshops focused on knowledge and skill acquisition, students appeared to be better prepared and more equipped to develop their long term professional goals. The students also had a better understanding of the ADA and the job accommodation process.

Petersen (1999) stated that "Today's workers are expected to handle more pressure, more change, more technology, and more communication" (p.5) and the only way for students with disabilities to meet these demands is for post-secondary institutions to provide transition services. Previously, Lankard (1993) provide the bases for Petersen's statement, indicating that disability support services should provide a collaborative effort between the student and a multidisciplinary team to provide "the fullest opportunity, and support to fulfill the typical roles in society" (p.1). Petersen believed that disability services should incorporate the Individualized Transition Plan (ITP) used by secondary educational settings in the college environment.

Legislation

The disability rights movement in the United States can be traced back to 1817, with the founding of the American School for the Deaf in Hartford, Connecticut. This unprecedented achievement was the first school for children with disabilities. As the years went by, leading up to the late 20th century, many small obstacles have been overcome by individuals with disabilities. Unfortunately, those obstacles/barriers were not removed for every single individual with a disability. The 1960's were considered the "Golden Age of

Rehabilitation" because more and more services were being offered. In 1963, President John F. Kennedy addressed the U.S. Congress "to retain in and return to the community the mentally ill and mentally retarded, and there to restore and revitalize their lives through better health programs and strengthened educational and Rehabilitation services." The following year the Civil Rights Act was passed, making it unlawful to discriminate on the basis of race across all settings, public and federal/state. However, the Civil Rights Act did not address disability. That took another four years to enact, in the form of the Architectural Barriers Act, which required all federal buildings to be accessible to those with physical disabilities. However, this act still does not address the concern of "discrimination towards those with disabilities."

The decade prior to the Rehabilitation Act of 1973 was a politically ripe one (Albrecht, Seelman, & Bury, 2001). With the passage of the Civil Rights Act, everyone wanted to be able to/right to participate in all activities and be free from discrimination. In 1970, due to the slow growth of outcomes in the rehabilitation field, the Disabled in Action group was found, organizing demonstrations and filing lawsuits on behalf of individuals with disabilities. Finally, in 1973, after being previously vetoed twice by President Nixon, the Rehabilitation Act was passed. The government's first true act focused on discrimination of individuals with disabilities. Both, the Rehabilitation Act and the Americans with Disabilities Act, which were passed, were not the original ideas. Supporters of both acts originally wanted more, but had to settle for less. President Nixon's and his following conservative's reason for vetoing the first two drafts of the Rehabilitation Act was that they allowed the disabled individual to participate in the process too much, giving the individual

too much power. In other words, the individuals were to be given too many "rights." However, after many lawsuits and public demonstrations, many of those rights have been given back to the individuals.

The big difference between the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, is that the Rehabilitation Act only applied to programs, profit and nonprofit, who received federal funding (Rubin & Roessler, 2001). It wasn't until 17 years later, that the Americans with Disabilities Act required ALL programs or places of employment was to not discriminate against any individual because of a disability. Thus, the Rehabilitation Act only protects employees of the federal government or of federal government contractors, while the Americans with Disabilities Act protect employees in the private sector.

The Rehabilitation Act of 1973 focused primarily on federal agencies and such. The federal government must put into operation affirmative action programs in the federal government work place as well as in those who receive federal funding of $2,500 or more and have fifteen or more employees; and take responsibility for oversee that public buildings and transportation are accessible. Moreover, the Rehabilitation Act added that even if individuals are hired, advanced or so forth under the affirmative action programs, the individual couldn't be discriminated against after placement by such means as less compensation or benefits compared to individuals working who do not have a disability. Unfortunately, the Rehabilitation Act did not stipulate whether the state government was responsible for these actions as well. However, the Rehabilitation Act does give individuals with disabilities the same rights and power as stated in the Civil Rights Act of 1964,

regarding the individual's right to litigation and compensation after one has been discriminated against. The Equal Employment Opportunity Commission is authorized by the Civil Rights Act to handle such litigation.

The primary objectives sought by supports of the Rehabilitation Act was to maintain and improve state and federal programs, to provide quality vocation rehabilitation services and redirect those services to individuals with the most severe disabilities, and provide active involvement by clients in the rehabilitation process through the development of the IWRP. Supporters also wanted the Act to provide special attention to target groups whose rehabilitation problems were known to be difficult, as well as promote the elimination of environment barriers. Supporters wanted all of these with the intention of utilizing to the fullest extent possible, community, state and federal resources to promote and expand employment opportunities, through training, facility changes and new research. The downfall of the Rehabilitation Act was that it did not change the view of the society towards those with disabilities, and many believe the Rehabilitation Act did not work because of this.

The Americans with Disabilities Act grew out of the Rehabilitation Act, but more importantly, it added where the Rehabilitation Act left off. Hermann (1997) wrote:

> "The purpose of the Americans with Disabilities Act of 1990 includes: 1) providing a clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities; 2) providing clear, strong, consistent, enforceable standards addressing discrimination against individuals with disabilities; 3) ensuring that the federal government plays a central role in enforcing the standards established

> in this Act on behalf of individuals with disabilities and; 4) invoking the broad sweep of congressional authority, including the power to enforce the Fourteenth Amendment and to regulate commerce, in order to address the major areas of discrimination faced daily by people with disabilities" (p.308).

The Americans with Disabilities Act was the first time that individuals with disabilities gained FULL legal citizenship. Unlike the Rehabilitation Act, The Americans with Disabilities Act did change the view of society. Nearly every place of employment had to now recognize and work with individuals with disabilities in some way.

One of the most important similarities between the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 was the notion of "reasonable accommodations." Employers were and are here forced to make the necessary changes to a job or the work environment so that an individual with a disability can perform the required work effectively. However, the Act did protect the employers by adding that the accommodation had to be "reasonable" and must not cause "undue hardship" on the business or change the business itself. Under the Rehabilitation Act however, this responsibility is created by regulation, whereas in the Americans with Disabilities Act, this responsibility is imposed in the statue itself.

Overall, even though the supporters of the Rehabilitation Act were disappointed with its outcome, the passage of the Americans with Disabilities Act gave them tremendous hope for the future. In general, the ADA appears to be working for the time being. The disabled community now has every "right" as those who do not have a disability. However, ADA

supporters are facing a new problem, one that is harder to tackle, resource allocation. Although individuals with disabilities have the right to every thing and services offered, money constraints are restricting them from getting to these.

Disability Services

In the past decade, college students with disabilities have been receiving increased attention. The majority of literature and research on college students with disabilities has grown exponentially, covering a wide range of related topics. Research has focused on the effects of cognitive and affective variables on college performance, faculty and advisors willingness to accommodate college students with disabilities, and college students with learning disabilities as a homogenous group. However, there has been limited research in regards to specific learning disabilities and their impact on academic achievement.

The U.S. Department of Education's National Center for Education Statistics (2002) reported that of the approximately 16.5 million undergraduate students in the United States, 1.6 million or 9.3% has some type of disability. Of those reporting a disability, 5% (approximately 75,000) have been identified as having a specific learning disability. This number appears to be low in comparison to previous published figures; however, previous data had included attention deficit/hyperactivity disorder in the same category.

Researchers have pondered many ideas over the last two decades as to why students with disabilities have such difficulty acquiring postsecondary education. Dalke and Schmitt (1987) theorized that it was due to the actual transition process that takes place from high school to the postsecondary educational setting. Dalke and Schmitt point out that in the high

school setting, students with disabilities are identified more readily by the teachers and school faculty, and are given direct access to special education or support services. At the high school level, the support is structured and proactive. Teachers are willing to make modifications not only to the classroom environment, but to the curriculum as well. Other accommodations received in secondary education include remedial support, test or assignment modification, and even in class assistants or tutors.

In contrast, at the postsecondary level, Dalke and Schmitt found that students must seek services themselves, of which many campuses do not make take extra efforts to make students aware of such support services. The support services are not structured and are passive in nature. That is, it is up to the student as to whether he or she uses the accommodations given. In 1988, Siperstein reported "the service delivery systems in many colleges have not worked well enough to attract and keep students with learning disabilities and then send them into the workplace with jobs commensurate with their abilities."

Chandler (1984) defined two important terms related to disability support services, remediation and compensatory support or accommodations. Chandler defined remediation as "teaching designed to bring a child up to the level of his age mates; this usually involves special techniques, and materials." While defining accommodations as "teaching is the attempt to get a child to pass a required academic course by doing what the regular class teachers should have been doing all along – teaching." While this view may be rigid in thought, it still holds true today. Researchers continue to report on the standardized procedures students must go through to receive support services, self-disclosure and providing documentation, and the types of accommodations colleges are willing to provide to

students (Crank and Deshler, 2001). While other researchers stress that the standard accommodations provided on college campuses, extended time on tests, tape record lectures, reduced distraction testing environment, are not enough (Reiff, 1997; Barbaro, Christman, Holzinger & Rosenberg, 1985). Researchers have been presenting the idea that students with disabilities need more than the standard accommodations.

In 2000, Wilson, Getzel and Brown discussed the need for students with disabilities to research postsecondary institutions of interest, looking for qualities such as campus climate, program philosophy, awareness and support, academic adjustments, waivers and course substitutions, course load and graduation time, and tutorial support available. Wilson et al. believed that matching the needs of the student to the services and opportunities provided for by the university, will have a greater rates of success in attaining a college degree. Yuen and Shaughnessy (2001) point out that all universities should be providing such services to meet the needs of all college students with disabilities. Yuen and Shaughnessy deem that the standardized accommodations being used by most colleges and universities are not helping retain and engage students with disabilities. Instead, colleges and universities should strive to provide new curricula aimed at promoting self-determination and self-advocacy. Such programs would be tailored to the student's needs on an individual basis in which the level of modification would depend on the severity of the disability. Jacobs and Glater (1993) and Reiff (1997) had previously described this process even further, explaining that there should be a strong collaborative effort or "strategic goal planning" between university departments and disability support services. However, Reiff further went on to

state that this collaboration does not currently exist today, and without it, students will continue to struggle in the college or university setting.

While this collaborative effort between university departments and disability services appears to be weak, recent research has shown support by faculty to accommodate students with disabilities. Bourke, Strehorn, and Silver (2000) surveyed 485 faculty members at the University of Massachusetts who had provided students with learning disabilities classroom accommodations in the fall of 1995. Results suggested that faculty members who believed that accommodations were necessary and helped students to succeed had an easier perceived time providing alternative test formats as well as providing extended time on test. The same results were true for faculty members who had a greater understanding of the importance of accommodations. Similarly, it was found that the department's belief about accommodations was positively related to the faculty member's belief that accommodations helped students succeed in the classroom.

Bourke and Strehorn's findings support earlier research on college and university faculty's willingness to provide accommodations. Nelson, Dodd and Smith (1990), Houck, Asselin, Troutman and Arrington (1992), and Vogel, Leyser, Wyland and Brulle (1999) all concluded that faculty were quite willing to provide the necessary accommodations to students with disabilities; however, their willingness did vary. Nelson et al. (1990) found that faculty members were more comfortable giving students with disabilities extra time on texts, while they did not like to give extra credit assignments, teacher lecture notes or allow students to turn in tape-recorded assignments instead of written assignments. Similarly, Houck's et al. (1992) survey of 109 faculty and 194 students with learning disabilities found

that not only were faculty members willing to make some accommodations more than others, but they also believed that providing these accommodations was fair to the nondisabled students. Faculty members believed that accommodations were used to help struggling students, who may be lacking the necessary skills, which the nondisabled students used in the classroom. Another interesting finding was that faculty members had a very positive belief that students with learning disabilities were capable of successfully attaining a college undergraduate degree.

In 1999, Vogel et al. focused their research on what is known as the standard accommodations provided by disability support services to students with disabilities. In their survey of 420 faculty members' attitudes and practices at a large Midwestern university, their findings were analogous to those of Nelson et al. (1990) and Houck et al (1992). Vogel et al. research focused on two types of accommodations, teaching accommodations and testing accommodation, as well as the fairness of such accommodations. Teaching accommodations included allowing the student to tape-record lectures, clarify/review lectures or assignments, provide comments on drafts of papers, assist in preparing for exams, provide copies of overhead and lecture notes, and allowing the student to complete an assignment in an alternative format. Of these teaching accommodations, survey results revealed that faculty were most willing to allow students to tape-record lectures (92%), clarify/review lectures or assignments (73.5%) and comment on drafts of papers prior to submitting it in for a grade (71.1%). However, faculty members were less likely to assist in preparing for exams (56.2%), provide copies of lecture notes (51.5%) or allow students to complete assignments in an alternative format (43.9%). When survey results of testing accommodations were

analyzed, faculty were more willing to allow exams to be proctored in a supervised location other than the classroom (83.1%), allow the use of a calculator (81.0%), allow the use of a word processor (75.6%), and allow students additional time to complete an exam (74.1%). On the other hand, faculty were less willing to provide students with paraphrased test questions (35.0%) or provide alternative exam formats (26.5%). Of the faculty surveyed, 62.9% to 70.1% stated that providing accommodations to students with learning disabilities is fair to nondisabled students, while 0.8% to 3.9% believed that accommodations gave an unfair advantage.

Math and Reading Disorders

Definitions

The DSM-IV-TR (2000) defines the criteria of 315.1 Mathematics Disorder as: "Mathematics ability, as measured by individual administered standardized tests, is substantially below that expected given the person's chronological age, measured intelligence, and age-appropriate education" (p.54). Also known as Dyscalculia and developmental arithmetic disorder, Mathematics Disorder is a learning disability similar to dyslexia, or difficulty with reading. Among those with dyscalculia, some can develop math phobia, or a fear of math, because of bad experiences with math or in math class, or simply because of poor self-confidence in the subject (Toppo, 2003).

Similarly, the ICD-10 has set guidelines for diagnosing math disorders which are:

> A specific impairment in arithmetical skills that is not solely explicable on the basis of general mental retardation or of inadequate

> schooling. The deficit concerns mastery of basic computational skills of addition, subtraction, multiplication, and division rather than of the more abstract mathematical skills involved in algebra, trigonometry, geometry, or calculus.
>
> The child's arithmetical performance should be significantly below the level expected on the basis of his or her age, general intelligence, and school placement, and is best assessed by means of an individually administered, standardized test of arithmetic. Reading and spelling skills should be within the normal range expected for the child's mental age, preferably as assessed on an individually administered, appropriate standardized test.

The DSM-IV-TR (2000) defines the criteria of 315.00 Reading Disorder as: "Reading achievement, as measured by individually administered standardized tests of reading accuracy or comprehension, is substantially below that expected given the person's chronological age, measured intelligence, and age-appropriate education" (p.53). While both definitions and guidelines assert that the assessment and diagnoses should be made during developmental years, because of lack of resources, many individuals may not be diagnosed until early adulthood or later.

To be formally diagnosed with a learning disability in mathematics or reading, individuals typically participate in a neuropsychological evaluation. The individual, as well as other important members of their family are interviewed to gain important background information about the individual. The individual is then administered a battery of psychological, neuropsychological, and achievement tests. While to diagnosis a learning

disability only requires the administration of an intelligence and achievement tests, many neuropsychologists administer other tests to help determine the specific nature of the deficit, as well as to rule-out any other reason for the deficit to be present. Current standards suggest that an individual must score "substantially below," that is a fifteen point or more discrepancy, or 2 standard deviations be present between the overall intelligence quotient and the achievement score to give a diagnosis of a learning disability (APA, 2000).

Assessment techniques

According to the DSM-IV-TR (2000), any individual which meets this criteria may have deficits in linguistic, attention, and perceptual skills, and in some cases, all three areas may be impaired. A number of various standardizes tests may be used to diagnose the disorder, including the following: The Wechsler Adult Intelligence Scale (WAIS), the Woodcock-Johnson Tests of Achievement, the Wide Range Achievement Test (WRAT), the Peabody Picture Vocabulary Test (PPVT), the Wechsler Individualized Achievement Test (WIAT), and the Wonderlic Personnel Test.

In considering IQ scores in relation to learning disabilities and assessment, it is important to note that intelligence exists as just one of the many issues pertinent to occupational choice, and admittedly might not ultimately prove as important as motivation, discipline, or other personality variables (i.e. ability to work and communicate with others, attitudes toward work, etc.) (Leverett, Matthews, Darin, Bell, & Bell, 2001). Furthermore, it must be taken into consideration that there is often overlap between academic achievement, cultural background, and IQ measures, and an individual's learning disability could certainly affect the assessment of their overall cognitive potential.

This is particularly true in the case of those who have a diagnosis of Dyscalculia, as the inability to conceptualize problems in a mathematical manner does not reflect an overall intelligence level, but instead may point to a discrepancy in learning style, ability to think in structured mathematical terminology, or the lack of exposure to techniques in mathematical computation utilizing various strategies. Many topics vital for learning disabled students are not stressed and sometimes are even ignored in the classroom. The reason for this lack of emphasis on some important topics is that normal children learn most of these concepts from their environment; therefore teachers very often take the acquisition of these concepts for granted (Halpern, 1981).

Current Research

Recently, increasing numbers of individuals with learning disabilities who are entering college for the first time, have been found to have special needs related to both academic survival and career development that are often unrecognized and unmet in institutions of higher education (Levinson & Ohler, 1998). These special needs greatly impact their chances for vocational success since individuals with learning disabilities have been found to be passive learners, who then might not engage in exploratory activities such as part time jobs or extracurricular activities (Alley et al., 1983). Knowing this, these individuals may be less likely to engage in vocational pursuits or vocational-based extracurricular activities, to explore career interests, or put forth effort toward finding appropriate employment after graduation.

Research suggests that these individuals may enroll in "easy" courses, without meeting the appropriate challenges that would steer them toward gainful employment later on, which greatly impacts their career maturity at any stage of development. In a study conducted by Vogel & Adelman (1992), students with learning disabilities took almost one year longer to complete their undergraduate degree than students without learning disabilities. The authors suggested this may either be due to the challenge of the curricula, a lack of resources, or the belief that they cannot succeed due to inappropriate labeling or inappropriate recommendations based on assessment measures.

According to literature, individuals with learning disabilities have problems processing information correctly and may find facts about the world of work to which they have been exposed in texts, lectures, and literature to be both confusing and overwhelming (Zinkus 1979, as cited in Levinson & Ohler, 1998). As a result, the ability to self assess abilities, deficits, interests and values is often impaired, and decision making of all types, including career decision making, becomes a difficult and problematic process. Even with greater numbers of students with learning disabilities enrolling in postsecondary institutions and the growing concern for their academic success, very few institutions are systematically monitoring these students' academic performance or graduation and attrition rates (Vogel & Adelman, 1992).

Research in the past two decades has focused on a number of factors relating to college students with disabilities; however, the main focus of these studies has been on college students with non-specific learning disabilities, and predictors associated with these students success in the postsecondary educational setting. In a recent study by Heimen and

Precel (2003) comparing 191 college students with learning disabilities to 190 college students without learning disabilities attending the same university. Heimen and Precel's findings indicated no significant differences existed between the two groups on GPA, family status, and number of courses taken. However, during tests or exams taken within the college classroom, students with learning disabilities had significantly higher forms of stress, anxiety and frustration than the students without learning disabilities. Heimen and Precel stated that students with learning disabilities found that testing accommodations, either in the classroom or provided by the universities disabilities support services, did helped them feel less stressed and frustrated. Heimen and Precel's findings regarding the affective state of college students with learning disabilities supports previous research indicating that not only do college students with learning disabilities face greater difficulty in achieving academic success than non-learning disabled college students, but they also must learn to cope with increased levels of emotional distress and anxiety (Dwinell & Higbee, 1991; Watson, 1992; Faust, Ashcraft & Fleck, 1996; Higbee & Thomas, 1999).

Another body of literature has attempted to identify more specific predictors of college academic success among students with learning disabilities. Vogel and Adelman are two of the leading researchers in the field, producing numerous studies on such predictive variables. In 1990, Vogel and Adelman compared 110 college students with learning disabilities to a random, stratified group of college students without learning disabilities. Vogel and Adelman examined the variables: high school preparation and performance, ACT scores, college exit GPA, graduation and academic failure rate, and time to complete a bachelor's degree. In this earlier study, findings indicated that there was a strong correlation

(r = .40 and r = .26, respectively) between English and math courses competed in high school with a C or better and college exit GPA. When compared to the non-learning disabled students, the students with learning disabilities scored significantly lower on ACT scores, as well as ACT subtest scores. However, only the ACT math subtest score was found to be significantly correlated with college exit GPA. When comparing the college exit GPAs of each group, students with learning disabilities had significantly lower GPAs than students without learning disabilities.

In 1992, Vogel and Adelman published another study comparing academic variables of 62 college students with learning disabilities to 58 college students without learning disabilities that contradicted their previous findings. Participants in the study consisted of college students how had been enrolled in at least one semester of college between 1980 and 1988. The two groups were matched by gender and ACT Composite score, and then given three college-wide screening tests to establish current functioning level. The screening tests measured reading comprehension, sentence structure, and essay writing. On all three screening measures, the students without learning disabilities scored significantly higher when compared to the students with learning disabilities group ($t = -3.41$, $p<.001$; $t = -3.54$, $p<.001$; $t = 2.94$, $p<.01$ respectively). Upon data analysis, Vogel and Adelman found that students with learning disabilities had a slightly higher GPA ($M = 2.43$) than the non-learning disabled group ($M = 2.18$). When examining graduation rate, the students with learning disabilities again had a slightly higher rate (33%) compared to students without learning disabilities (25.5%). Additional findings included that students without learning disabilities had a significantly higher academic failure rate (51% compared to 18%), students

with learning disabilities on average took a lighter course load (10.2 credit hours compared to 12.6), and students with learning disabilities on average took one year longer to graduate (6 years compared to 5 years). Vogel and Adelman pointed out that although students with learning disabilities appeared to be doing better than their non-learning disabled cohort, the results of their study may be skewed because of the matching of students based on ACT Composite scores. While the students with learning disabilities had low ACT Composite scores, it was likely that the students without learning disabilities who had those same low score may have had unidentified learning disabilities. Also of importance is that the students with learning disabilities were receiving classroom and/or test accommodations through the universities disability support services, while the non-learning disabled students received no additional academic support.

Taking a different approach, Murray and Wren (2003) have attempted to identify which student characteristics are predictors of college GPAs among students with learning disabilities. At a large private university in the Midwestern United States, Murray and Wren administered intelligence tests, academic tests and self-report measures of study habits and attitude to 84 college students with learning disabilities. Data obtained from these students was analyzed through three sets of statistical analyses, one-way ANOVA tests, zero-order correlation, and stepwise regression analysis. Results indicated that out of all the variables reported, only the students Full Scale IQ as measured by the WAIS-R or the WISC-R, and one self-reported study habit were predictors of college GPA. Analysis revealed that the students Delay/Avoidance study habit behavior accounted of 14% of the variance in the students' GPA while the Full Scale IQ accounted for 6% of the variance. The authors

reported that although the Full Scale IQ was a significant predictor of college GPA, it had a less than modest association.

Although data indicates that between 2% and 8% of school-aged children has a diagnosed learning disability in mathematics (Geary, 2004; Toppo, 2003), it is unclear what percentage of students in postsecondary education has a diagnosed learning disability in mathematics. What is well documented is that students with learning disabilities in mathematics leave high school with demonstrably lower levels of mathematics achievement than their peer group (Wagner, 1990, as cited in Bryant, Bryant, & Hammill, 2000). Unfortunately, the body of research on arithmetic functions and their disorders is considerably smaller both in quantity and quality when compared to the available data on reading, dyslexia, and alexia (Neumarker, 2000). In fact, after a review of literature using ERIC, PsycInfo, EBSCO, CINAHL, and Academic Search Premier databases, there are currently no published research on college students with learning disabilities in mathematics and their performance in the postsecondary academic setting.

Vocational Implications

Impact on career efficacy

Increasing numbers of persons with learning disabilities who are now entering college have been found to have special needs related to both academic survival and career development that are often unrecognized and unmet in institutions of higher education (Levinson & Ohler, 1998). These special needs greatly impact their chances for vocational success since persons with learning disabilities have been found to be passive learners who

then might not engage in exploratory activities such as part time jobs or extracurricular activities (Alley et al., 1983). Knowing this, these individuals may be less likely to engage in vocational pursuits or vocational-based extracurricular activities, to explore career interests, or put forth effort toward finding appropriate employment after graduation.

Persons with learning disabilities have problems processing information correctly (Zinkus 1979, as cited in Levinson & Ohler, 1998) and may find facts about the world of work to which they have been exposed in texts, lectures, and literature to be both confusing and overwhelming. As a result, the ability to self assess abilities, deficits, interests and values is often impaired, and decision making of all types, including career decision making, becomes a difficult and problematic process. And even with greater numbers of students with LD enrolling in postsecondary institutions and the growing concern for their academic success, very few institutions are systematically monitoring these students' academic performance or graduation and attrition rates (Vogel & Adelman, 1992).

In regards to career efficacy specifically, Panagos and DuBois (1999) found that the importance of considering subjective factors (i.e. self-efficacy beliefs and outcome expectations) rather than only objective skills (i.e. aptitudes and abilities) was more influential in shaping the career development of adolescents with LD. When comparing the vocational expectations of students with and without disabilities, expectations of students with LD and other disabilities have been found to be lower with regard to status, pay, and working conditions of jobs (Fisher, Harnisch, Harnisch, Wermuth, & Rusch, 1992, as cited in Panagos & DuBois, 1999).

Keeping this information in mind, the most important factors for professionals working with individuals with isolated learning disabilities such as Math Disorder are having resources and support networks in place for these individuals, and understanding the importance of the outcome of assessment measures and standardized tests, such as the ACT.

Self-Efficacy and Career

Gerber, Price, Mulligan and Shessel (2004) set out to examine the employment experiences of individuals with learning disabilities in Canada and the United States. Gerber et al. conducted the study using a purely qualitative research design. Based on a purposive framework, the researchers used convenience sampling and snowball sampling to gather appropriate participants. The sampling techniques were thus nontraditional and criterion-based, attempting to identify possible participants who met the inclusion criteria of having a documented learning disability and currently being employed. The study was conducted to examine (a) how U.S. adults view their LD with respect to employment, (b) how Canadian adults view their LD with respect to employment, (c) the impact that the ADA has had on adults with LD in the United States, and (d) the impact that the Charte of Rights and Freedoms has had on adults with learning disabilities in Canada.

Forty-nine participants in the study were interviewed one-on-one for 45 to 120 minutes. Interviews were structured off of the four issues previously stated, as well as job getting, experiences on the job and job advancement. Interviews were audiotaped and interviewers kept field notes, as well as preliminary impressions, insights and summary comments. All data was transcribed and coded for analysis. Researchers found that several

themes arouse throughout the interviews across all participants. Themes found are shown in Table 2.

Table 2

Results of the 49 interviews conducted by researchers

	Job Getting	Experiences on the Job	Job Advancement
Theme 1	Assistance of family and friends	Requesting and using accommodations on the job	Job advancement in both American and Canadian jobs
Theme 2	Interviewing varies widely in the workplace	Employer reaction to disclosure of learning disabilities	Ramifications of learning disabilities in job advancement
Theme3	Self-disclosure and one's first job	Coworker reaction to learning disabilities	
Theme 4	Requesting accommodations prior to employment		

Data analysis indicated that there is little difference between the experiences of individuals with learning disabilities being employed in the United States or Canada; although there are currently stronger civil rights mandates, specifically the Americans with Disabilities Act in the United States to support and protect the rights of these individuals.

In 2003, Willis conducted a study to examine the social cognitive variables related to employment outcome among 102 young adults with emotional disturbances. Through telephone interviews, Willis was able to gather demographic variables, employment status, as well as administer measures of self-efficacy and outcome expectations. Results of the study indicated that individuals had greater employment rates if they had higher levels of work self-efficacy, work outcome expectations, and motivation to work. Results suggested that higher work self-efficacy was also highly correlated with higher levels of work productive,

while on the other hand, results indicated that individuals who did not want to work, had lower levels of work productive. Of those surveyed, Willis also found that those individuals who had higher work outcome expectations were more likely to be working and less likely to enroll in postsecondary education.

Lent, Lopez, Mikolaitis and Jones (1992) conducted a different study regarding self-efficacy and outcome expectations. Instead of investigating employment outcomes, Lent et al. focused on how the social cognitive variables affect the recovery process of individuals with psychiatric disabilities. The study participants consisted of 103 adult psychiatric patients who had been recently discharged or were going to be discharged from a local mental hospital. Data analysis indicated that a patient's level of self-efficacy was a good predictor of how the individual perceived the severity of their symptoms and their perceived ability for community adjustment. That is, those patients who had higher levels of self-efficacy tended to view their symptoms as being more manageable, while at the same time, these same individuals believed that they were adjusting better or would have an easier time adjusting in the community. However, Lent et al. found that even though these results were significant, the outcomes all were dependent on the individual's reality-testing capabilities.

As a final point, Panagos and DuBois (1999) conducted a study to investigate how applicable career self-efficacy was to students with learning disabilities. Participants in the study consisted of 96 high school students diagnosed with learning disabilities attending a Midwestern suburban high school. Instruments used to measure dependent variables included the Career Ability Placement Survey (CAPS), the California Occupational Preference Interest Inventory – Picture Version (COPS-PIC), the Career Self-Efficacy Scale

and the Sources of Efficacy Information Scale (Note: the Career Self Efficacy Scale and the Sources of Efficacy Information Scale were developed for this study). Data analysis revealed a strong intercorrelation among aptitude scores and career areas (r = .93) as well as a significant correlation among self-efficacy ratings and career interest scores (r = .50). Surprisingly though, self-efficacy and interest scores had a very weak correlation with aptitude scores (r = .13 and r = .06 respectively). Final analysis revealed a significantly positive correlation between outcome expectations career interest scores (beta = .48 to .50) as well as perceived self-efficacy (beta = .42 to .46). Panagos and DuBois state that "it appears that the extent to which students with LD perceive themselves to be capable of successfully pursuing careers in different areas is an important factor influencing their patterns of interest and hence, motivation with respect to exploring various vocational possibilities."

Results of the study suggest that three of the four principle sources of self-efficacy (performance accomplishments, vicarious learning, and verbal persuasion) are the most important factors to influence students with learning disabilities. Panagos and DuBois suggest that these individuals should participate in more vocational opportunities such as job training and part-time employment during high school so that they can become more equipped post high school when developing a career plan.

CHAPTER THREE
Methodology

Statement of Purpose of this Study

In light of previous research on students with learning disabilities, it is apparent that contradicting findings suggest that this student population should not be treated as a homogenous group. In stead, research should focus on the different types of learning disabilities and how that specific learning disability impacts the student's academic success. The purpose of this study is to (a) investigate if there are differences in academic achievement among college students with diagnosed learning disabilities in mathematics and reading, and the general student population attending a 4-year public university, and (b) to determine whether the individuals believed that their reasonable accommodations helped them academically.

Hypotheses

The specific hypotheses of this study are the following:

1. Students with learning disabilities in mathematics will score significantly lower than the general student population on the ACT standardized test.
2. Students with learning disabilities in mathematics will score significantly lower than the general student population on the ACT Math subtest.
3. Students with learning disabilities in mathematics would have significantly lower college GPAs than the general student population.

4. Female students with learning disabilities in mathematics would have significantly lower ACT scores and college GPAs than male students with learning disabilities in mathematics.
5. Students with learning disabilities in mathematics will have relatively low levels of self-efficacy.
6. Students with learning disabilities in mathematics will have low levels of social adjustment.
7. Students with learning disabilities in mathematics will have lower achievement scores as measured by the ACT and college GPA than students with learning disabilities in reading.
8. Students with learning disabilities in mathematics will have commensurate levels of social adjustment compared to students with learning disabilities in reading.
9. The standard reasonable accommodations provided in the classroom did help the individual.
10. Students with learning disabilities in mathematics and reading will have limited knowledge of the Americans with Disabilities Act (ADA), and their rights under the ADA.
11. Students with learning disabilities in mathematics and reading will lack knowledge about how to request reasonable accommodations and when to disclose their disability.
12. Students with learning disabilities in mathematics and reading will have participated in few programs to assist in exploring and choosing a formal vocational choice.

Sample Selection

A non-probability, purposeful sampling technique will be utilized in this study. Using this sampling technique allows the researcher to identify participants with similar characteristics, but does affect the generalizability of the results. The researcher has set a criterion that all participants must have been enrolled at the university for at least two semesters at which time they have taken at least one core math course, the student must have a documented learning disability in math or reading, and the student must have been registered with the universities disabilities services office. Since the participants will all be registered with the universities disabilities service office, the study will also be using convenience sampling which Berg (2004) defined as "This category of sample relies on available subjects – those who are close at hand or easily accessible" (p35).

Participants

The participants in this study will be drawn from a pool of students attending a public university in the south-central United States. Participants will be diagnosed with learning disabilities in mathematics or reading as defined by the DSM-IV-TR (2000) that were receiving support services for their learning disability at the university during the years 2000, 2001, 2002, 2003, and 2004. Students who had been previously diagnosed with additional learning disabilities as well as in mathematics or reading will be included in this study. The initial pool should yield a total of 70 students. However, to eliminate inconsistencies in our reporting, we will restrict our analyses to those students for whom we have complete data files. All students will be undergraduates at the time of data collection. Ethnic backgrounds will include Caucasian, Hispanic, African-American, Asian, and other.

This study will also include the general student population at a south-central, public, 4-year university. The current enrollment at the university is 16,449, of which, 13,125 are undergraduate students. The student population consists of 49% women and 51% men, with the total minority enrollment being approximately 12.3% (2,021 students). The average ACT score for incoming freshman is approximately 25.4, with an average high school GPA of 3.6 on a 4 point scale. The university also has a student, faculty ration of 17 to 1.

Materials

Informed Consent Form

Individuals will receive an explanation of the purpose of the study at the time of initial contact via mail and telephone. The purpose of this study will then be discussed with subjects before obtaining written informed consent at the time of the interview.

College Grade Point Average.

One outcome variable in this study was college grade point average (GPA). GPAs for all participants were gathered from the universities computerized records known as SAFARI. These records provided cumulative GPAs for all participants up to the semester directly preceding the data collection activities. GPAs at the university are reported on a scale ranging from 0.0 to 4.0. On this scale, grades of A are reported as 4.0, grades of B as 3.0, grades of C as 2.0, grades of D as 1.0, and grades of F as 0.0.

American College Testing (ACT).

Another outcome variable in this study was ACT scores. ACT scores for all participants were gathered from the universities computerized records. These records provided the ACT Composite score as well as the ACT Math subsection score for all participants. The records also provided the number of times in which students had taken the ACT to achieve their highest scores. The ACT test is generally taken by students prior to enrollment at the university and is used by the university for admissions purposes. The general format of the ACT is a four section, multiple-choice, "correct answer scored" test in which errors are not deducted from the scores. The ACT scores have a range from 1 (low) to 36 (high) for each of the four subtests and the Composite score. The ACT Composite score is the average of all four subtests. For the purpose of this study, only the ACT Composite score and the ACT Math subtest score were used.

Self-Efficacy Scale (SES)

In 1982, Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs and Rogers developed the widely used Self-Efficacy Scale (SES) to measure an individual's general level of belief in one's own competence. The instrument asks subjects to answer 30 items with regard their personal attitudes and traits on a 5 point Likert-type scale ranging from "Disagree strongly" to Agree strongly." The SES has measures two subscales, general self-efficacy and social self-efficacy.

In the original 1982 sample, Sherer et al. administered the 30-item SES to adults from the same geographical region in the southern United States to examine the human

experiences associated with terminal illness and dying. The sample of adults (N=526) consisted of 376 undergraduate college students in an introductory psychology class and 150 inpatients from a Veterans Administration alcohol treatment unit. Sherer et al. did not control for any demographic variables in their initial study.

The SES questionnaire was then scored and analyzed for statistical significances. The psychometric properties of the SES are reported as adequate (Sherer et al, 1982). The SES was found to have a fairly good internal consistency reliability using the Cronbach's alpha with alpha coefficients with a .86 for the general subscale and .71 for the social subscale. Test-retest reliability was not reported in thus study. In Sherer's et al. study, good criterion-related validity was found, as well as good construct validity was found, with SES scores correlating significantly with a number of measures such as the Ego Strength Scale, the Interpersonal Competency Scale, and the Rosenberg Self-Esteem Scale.

The SES was used in a 2002 study by Blake and Rust, to explore the association among self-esteem and self-efficacy in college students with physical and learning disabilities. The study population consisted of the 48 college students attending Middle Tennessee State University who were receiving support services through the universities Disabled Student Services office. Blake and Rust found a significant correlation between overall self-esteem and General Self-Efficacy ($r = .47$, $p<0.01$), as well as a strong correlation between three subscales of self-esteem (Collective, Membership, and Private) and General and Social Self-Efficacy (range of r from 0.34 to 0.60). Interestingly though, Blake and Rust found that their sample had either the same or higher scores in regard to self-esteem and self-efficacy, than the normative sample. They believe this may be due to the fact that

individuals with disabilities who are enrolled in postsecondary education have had to face greater challenges in achieving their goals, and thus have greater beliefs in regard to their capabilities to succeed. This statement is supported by Blake and Rust's finding that individuals with severe or more visible disabilities have higher levels of Social Self-Efficacy ($r = .33$ and $.30$, $p<0.05$ respectively). Results also indicated an inversely strong correlation between social self-efficacy and age of disability onset ($r = -0.35$), suggesting that individuals who are born with a disability are more likely to have greater levels of social self-efficacy, while those who acquire a disability later in life may still be trying to cope with adjustment to disability issues.

Social Adjustment Scale-Self Report (SAS-SR) modified

The original Social Adjustment Scale-Self Report (SAS-SR) by Weissman and Bothwell (1976) consisted of 54-items designed to measure adaptive functioning within a variety of social contexts including work outside the home, work at home, work as a student, social and leisure, extended family, marital, paternal, family unit, and economic issues, which help operationalized overall social adjustment. The original study sample was based off of a number of clinical and nonclinical groups ($N = 399$) of which 272 were female and 127 were male. Clinical groups consisted of 172 acute depressives, 26 alcoholics, and 35 schizophrenics.

The SAS-SR questionnaire was then scored and analyzed for statistical significances. The psychometric properties of the SAS-SR are reported as fair. The SAS-SR was found to have a fairly good internal consistency reliability using the Cronbach's alpha with alpha

coefficients with a .74 as well as good stability in test-retest after one month, alpha equals .74. In Weissman and Bothwell's study, fair concurrent validity and good known-groups validity was demonstrated.

In 1996, Heiligenstein, Guenther, Hsu and Herman conducted a study to investigate the incidence of depression among college students attending the University of Wisconsin. The study population consisted of 63 college students who were being seen at the Counseling and Consultation Services. The SAS II, a 1979 revised version of the SAS-SR was administered in this study (the SAS II only consists of 42 items compared to the original 54-item questionnaire). Data analysis revealed a significant correlation between the Beck Depression Inventory (BDI) and the SAS II functional impairment score ($r = .34$, $p<0.05$), thus students who were more depressed reported higher levels of functional impairment on the SAS II. Heiligenstein and Guenther found a significant correlation between the BDI and the SAS II affect impairment score ($r = .44$, $p<0.05$). Results suggest that individuals who are more depressed will be less likely to be motivated to work, attend classes, or participate in activities.

Procedure

Phase I

The data for the current study will be gathered from computerized records. Information related to disability, gender, and ethnicity will be drawn from the Center for Students with Disabilities computerized database. Information related to grade point averages, math courses taken, ACT scores will be drawn from the universities computerized records known as SAFARI. The universities computerized records system provides current

data for all students and grade point averages for all students attending the university in the semester directly preceding the data collection activities.

Data collected on all variables will be entered into a spreadsheet by the research coordinator. A member of the research team will make a formal check of the data, verifying that the data entered was the original data obtained from the computerized records. The data will then be entered into SPSS for analysis, again being verified for accuracy. Since the data will contain two groups with multiple variables, statistical analysis will consist of a one-way MANOVA and a one-sample z test. Using the MANOVA for statistical analysis will allow researchers to determine if there is a statistically significant difference between different demographic variables and the multiple dependent variables being used. A MANOVA will also be used to determine if there is a significant difference between academic achievement and social adjustment scores for students with learning disabilities in mathematics compared to students with learning disabilities in reading. The one-sample z test will be utilized to compare the sample means to the known population means. Since the sample consist of individuals scores that were calculated into the population scores, a single sample t test can not be used and the z test is appropriate for this analysis. A statistically significant z test will indicate that there is a systematic difference between the sample and population, and the difference is not due to random variation or chance.

Phase II

Following the initial data gathering and analysis, a small group of the students will be randomly selected from the pool of 70 participants. The selected students will be contacted

via mail and telephone requesting their participation in a short interview. Before the interview begins, participants will be asked to complete the Self-Efficacy Scale (SES) and a modified Social Adjustment Scale-Self Report (SAS-SR). Face-to-face, audio-taped interviews will be conducted with each consenting participant. A 20-30 minute, semi-structured interview format will be used which will allow the interviewer to obtain the essential information necessary for the study, but will allow for flexibility to explore possible relevant issues or concerns brought up by the participants. The interviewer will make any field-notes from the interview immediately following the completion of the interview, as well as add any initial interpretations and impressions the interviewer may have. Member checks and triangulation will be used throughout the data gathering process to ensure that there is no interviewer bias and that the data is a true reflection of the participants lived experiences and beliefs. An audit trial will also be kept in an effort to provide future researchers the tools necessary to replicate this study.

Analysis of the data will be conducted using a grounded theory approach in order to provide evidence for or against the stated hypotheses. All recorded interviews will be transcribed an input into SPSS Text Analysis for Surveys program, as well as all other data gained from the interview process. The SPSS Text Analysis is a data reduction computer program in which the computer will code all inputted material and then run an analysis for possible themes. The themes will then be examined and interpreted by the researcher to help facilitate an understanding of the study results. The hope is that themes will emerge from the data analysis to help support the purposed hypotheses and further explain the results of the initial analysis. The SES and SAS-II will be scored and used for comparison to the previously

established quantitative data. Using the SES will allow the researcher to link the two sets of data, and will help explain the results of the qualitative interview.

Analysis

Two sets of analysis, a one-way MANOVA and a single sample z tests will be conducted to examine the differences between college students with diagnosed learning disabilities in mathematics and the general student population. Analysis will be completed across dependent variables controlling for gender. Analysis will be conducted to determine if differences exist between students only diagnosed with a mathematics disorder, and students who are diagnosed with additional learning disabilities as well as math disorders. Analysis will also be conducted to determine if differences exist between students with math disorders and students with reading disorders.

CHAPTER FOUR
Results

Limitations of Study

The findings in this study will need to be viewed in light of several limitations. First, we will consider all students with learning disabilities in mathematics as one homogenous group. It is well known that individuals with learning disabilities range in the complexity of their disability and how their disability affects their individual academic functioning. Previous research has shown that there are both cognitive and affective differences among students with learning disabilities when compared to their nondisabled cohort, and that these states effect the students academic achievement (Sewell, Farley & Sewell, 1983; Dwinell & Higbee, 1991; Watson, 1992; Patten, 1983; Faust, Ashcraft & Fleck, 1996). While at the same time, individuals with learning disabilities in mathematics may also have other learning disabilities that are not controlled for in this study. There is well-documented research on the link between math disorders and other academic disorders such as reading and writing (Knopik, Alarcon, & DeFries, 1997; Light & DeFries, 1995; Fuchs & Fuchs, 2002; Robinson, Menchetti & Torgesen, 2002), which will also need to be considered.

The second limitation that needs to be addressed is the small sample size and the selected population of study. The small sample size impacts the power of the results and the generalizability of the study to other populations. Since the population will be from a public, 4-year university in south-central United States, the demographic variables (e.g. socioeconomic status, ethnic make-up, disability services available) may be different than those at other universities throughout the United States.

The third limitation of this study that needs to be addressed is the need to control for further nuisance variables. While this study will control for gender differences, another very important nuisance variable is the number of and types of accommodations used by students with learning disabilities in the classroom. There is an obvious motivation factor in this variable that must be considered. Does an individual who seek and use all of their accommodations do better than students who only use their accommodations when deemed necessary? In regard to the type of accommodation provided, individuals with more severe learning disabilities may receive additional accommodations than a student with only mild or moderate learning disabilities.

Implications of Results

If the null hypothesis is true, and there are no significant differences found in this study, the results would be as follows:

While many researchers find non significant differences are of no use, in this study the findings would still be valuable. If the results of the primary analysis showed no significant findings, researchers would know that students with learning disabilities in mathematics appear to be having academic success. The students are receiving reasonable accommodations which appear to be beneficial in the classroom and the students are using their accommodations regularly. The students appear to be receiving beneficial support from disability services, as well as other student support services such as the universities tutoring and writing center and the career development center.

Additionally, the students are well adjusted, have high levels of self-efficacy, and understand how the Americans with Disabilities Act impact their lives. The students appear to be adjusting to college life and have normal social lives. The students are dealing with the stress of college life, and are making the transition from adolescents to adulthood smoothly. The students are using their natural support systems (family, friends, church, etc.) and find leisure activities to be helpful avenues for relieving stress. The students also exhibit high levels of internal locus of control, and find that they have control over their own lives.

If the null hypotheses were false, and there were significant differences found in this study, the results would be as follows:

The results of the primary analysis support the hypotheses that students with diagnosed learning disabilities in mathematics score significantly lower on the ACT and ACT Math subtest than students without learning disabilities. The results were also statistically significant after controlling for gender. Both male and female college students with learning disabilities in mathematics had significantly lower ACT Composite and ACT Math scores when compared to the general student population; however, no difference was found between the ACT Composite and ACT Math scores of male and female students with learning disabilities in mathematics. The results, similar to the findings of Vogel and Adelman (1990), support the hypothesis that students with learning disabilities in mathematics have significantly lower college GPAs than students without learning disabilities. However, the results refute the hypothesis that female students with learning disabilities in mathematics have significantly lower college GPAs than male students with learning disabilities in mathematics, indicating that there is no difference between the two

groups. These results contradict previous findings by Vogel and Adelman (1992) and Heimen and Precel (2003) suggesting that students with learning disabilities should not be viewed or researched as a homogenous group.

The results suggest that although students with learning disabilities in mathematics are receiving services and accommodations through the universities Center for Student with Disabilities, the services or accommodations do not appear to provide enough help academically. Although the primary reason for classroom accommodations for students with learning disabilities is to give those students equal opportunity to strive academically, the results indicate that these students still have a greater difficulty academically than their nondisabled cohort. These findings suggest that these individuals may require additional accommodations such as course or curriculum modifications, restricted academic workloads, and/or suitable course substitutions.

Results of the qualitative analysis suggest that students with disabilities lack knowledge about the Americans with Disabilities Act and how it applies to them. This lack of knowledge indicates that students are unaware of the important legislation protecting them from discrimination in the workforce. The students are confused about when to disclose their disability to a potential employer, and do not know how to request reasonable job accommodations. They are unfamiliar with the vocational rehabilitation system, and have had no formal vocational exploration opportunities. Having this lack of knowledge and lack of opportunity, the students have low levels of self-efficacy and confidence in their abilities.

Results suggest that students with mathematics disabilities are struggling to be in control of their lives. They do not have the natural support systems available or are not using

them to their advantage. They have difficulty managing their social life and are discouraged from participating in social activities. While the university setting is a time for students to gain self independence, the students in this study appear to be struggling. Coming from a completely dependent environment in the secondary education setting, the students feel lost and abandoned. They are in a state of shock, due to the lack of support. Many of the students find little interest in attending classes and are considering dropping out of college.

CHAPTER FIVE
Conclusions and Recommendations

Implications for Professionals

Professionals working with this population need to be aware of the potential stereotypes that students with disabilities encounter on campuses and the impact that these stereotypes could have on students' self-esteem (Kelly, Sedlacek and Scales, 1994), and thus, their development as students, individuals, and future professionals accessing higher education learning environments. Using appropriate language so as not to "label" the student is essential, and knowing how the student identifies their disability and what kinds of discrimination the student faces is critical.

According to Kelly, Sedlacek and Scales (1994) such information may be particularly useful to professionals working in college counseling centers in which the growing population of students with disabilities is likely to increase the demand for services. Many factors influence students' decisions to utilize or not utilize support services. A student may not recognize the need to utilize them, or having recognized the need, may not know how to access the available support services. Self-understanding, prior experience and reality testing, level of acceptance and denial, level of internal and external locus of control, availability and quality of intervention, developmental life stage, motivation, and goals are some of the complex factors that enter into the decision to acknowledge one's learning disability and seek out support services (Adelman & Vogel, 1991, as cited in Vogel & Adelman, 1992). Thus, individuals who have faced discrimination and prejudice derived

from the negative connotation of labeling may not only be discouraged from achievement but may be further discouraged from seeking support in an academic environment.

Practitioners should not treat the disability as a diagnosis or a symptom of a diagnosis, and should not assume that students have deficits in self-esteem, self-identity, or self-perception. Instead, it is important that practitioners look at the individual as a whole person, and not override the needs of the student in lieu of the presentation of a disability. Corrigan (1998) asserts that "counselors [and professionals working in an environment of higher learning] need to be informed about disability issues to provide appropriate services and meet the legal, ethical, and professional challenges of counseling this diverse group" (p. 181). Stanley (2000) further proposes "the nondisabled university community needs to be aware of the presence of individuals with disabilities in its environment" (p. 209).

Empowerment and advocacy should be the principal strategies of professionals working with this group. Professionals in the higher education environment need to understand that the disability is a part of the student, and not the issue, concern, or the problem. University officials, faculty and staff also need to be acutely aware of and responsive to the barriers, both actual and perceived, to students working toward achieving academic goals. Individuals with learning disabilities in mathematics are certainly capable of achievement in mathematics courses, with support, tutoring, and self-esteem building. If the individual believes that the disability is a challenge and not a deficit, he or she will be more likely to work toward academic and career success.

APPENDIX A
Measurement Instruments

Self-Efficacy Scale (SES)

This questionnaire is a series of statements about your personal attitudes and traits. Each statement represents a commonly held belief. Read each statement and decide to what extent it describes you. There are no right or wrong answers. You will probably agree with some of the statements and disagree with others. Please indicate your own personal feelings about each statement below by marking the letter that best describes your attitude or felling. Please be very truthful and describe yourself as you really are, not as you would like to be.

A = Disagree Strongly

B = Disagree moderately

C = Neither agree nor disagree

D = Agree moderately

E = Agree strongly

1. ___ I like to grow house plants.
2. ___ When I make plans, I am certain I can make them work.
3. ___ One of my problems is that I cannot get down to work when I should.
4. ___ If I can't do a job the first time, I keep trying until I can.
5. ___ Heredity plays the major role in determining one's personality.
6. ___ It is difficult for me to make new friends.
7. ___ When I set important goals for myself, I rarely achieve them.
8. ___ I give up on things before completing them.
9. ___ I like to cook.
10. ___ If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me..
11. ___ I avoid facing difficulties..
12. ___ If something looks too complicated, I will not even bother to try it.
13. ___ There is some good in everybody.

14. ___ If I meet someone interesting who is very hard to make friends with, I'll soon stop trying to make friends with that person.
15. ___ When I have something unpleasant to do, I stick to it until I finish it.
16. ___ When I decide to do something, I go right to work on it.
17. ___ I like science.
18. ___ When trying to learn something new, I soon give up if I am not initially successful.
19. ___ When I'm trying to become friends with someone who seems uninterested at first, I don't give up very easily.
20. ___ When unexpected problems occur, I don't handle them well.
21. ___ If I were an artist, I would like to draw children.
22. ___ I avoid trying to learn new things when they look too difficult for me.
23. ___ Failure just makes me try harder.
24. ___ I do not handle myself well in social gatherings.
25. ___ I very much like to ride horses.
26. ___ I feel insecure about my ability to do things.
27. ___ I am a self-reliant person.
28. ___ I have acquired my friends through my personal abilities at making friends.
29. ___ I give up easily.
30. ___ I do not seem capable of dealing with most problems that come up in my life.

Social Adjustment Scale-Self Report (SAS-SR)-modified

We are interested in finding out how you have been doing in the last *two weeks*. We would like you to answer some questions about your work, spare time, and your family life. There are no right or wrong answers to these questions. Check the answers that best describe how you have been in the last *two weeks.*

WORK OUTSIDE THE HOME

Please describe the situation that best describes you.

Do you usually work for pay more than 15 hours per week?

___ Yes

___ No

Did you work any hours for pay in the last 2 weeks?

___ Yes

___ No

SCHOOL

What best describes your school program? (Choose one)

___ Full Time.

___ ¾ time.

___ Half time.

Check the answer that best describes how you have been in the last 2 weeks.

1. How many days of classes did you miss in the last 2 weeks?

___ No days missed.

___ One day.

___ I missed about half the time.

___ Missed more than half the time but did make at least one day.

___ I did not go to classes at all.

___ I was out of town the last two weeks.

2. Have you kept up with your class work in the last 2 weeks?

___ I did my work very well.

___ I did my work but had some minor problems.

___ I needed help with work and did not do well about half the time.

___ I did my work poorly most of the time.

___ I did my work poorly all of the time.

3. During the last 2 weeks have you been ashamed of how you do your schoolwork?

___ I never felt ashamed.

___ Once or twice I felt a little ashamed.

___ About half the time I felt ashamed.

___ I felt ashamed most of the time.

___ I felt ashamed all the time.

4. Have you had any arguments with people at school in the last 2 weeks?

___ I had no arguments and got along very well.

___ I usually got along well but had minor problems.

___ I had more than one argument.

___ I had many arguments.

___ I was constantly in arguments.

5. Have you felt upset at school during the last 2 weeks?

___ I never felt upset.

___ Once or twice I felt upset.

___ Half the time I felt upset.

___ I felt upset most of the time.

___ I felt upset all of the time.

6. Have you found your school work interesting these last 2 weeks?

___ My work was almost always interesting.

___ Once or twice my work was not interesting.

___ Half the time my work was uninteresting.

___ Most of the time my work was uninteresting.

___ My work was always uninteresting.

SPARE TIME

Check the answer that best describes how you have been in the last 2 weeks.

7. How many friends have you seen or spoken to on the telephone in the last 2 weeks?

___ Nine or more friends.

___ Five to eight friends.

___ Two to four friends.

___ One friend.

___ No friends.

8. Have you been able to talk about your feelings and problems with at least one friend during the last 2 weeks?

___ I can always talk about my innermost feelings.

___ I usually can talk about my feelings.

___ About half the time I felt able to talk about my feelings.

___ I usually was not able to talk about my feelings.

___ I was never able to talk about my feelings.

___ Not applicable; I have no friends.

9. How many times in the last 2 weeks have you gone out socially with other people? For example, visited friends, gone to movies, bowling, church, restaurants, invited friends to your home?

___ More than 3 times.
___ Three times.
___ Twice.
___ Once.
___ None.

10. How much time have you spent on hobbies or spare time interests during the last 2 weeks? For example, bowling, sewing, gardening, sports, reading?

___ I spent most of my spare time on hobbies almost every day.
___ I spent some spare time on hobbies some of the days.
___ I spent a little time on hobbies.
___ I usually did not spend any time on hobbies but did watch TV.
___ I did not spend any spare time on hobbies or watching TV.

11. Have you had arguments with your friends in the last 2 weeks?

___ I had no arguments and got along very well.
___ I usually got along well but had minor problems.
___ I had more than one argument.
___ I had many arguments.
___ I was constantly in arguments.
___ Not applicable; I have no friends.

12. If your feelings were hurt or offended by a friend during the last 2 weeks, how badly did you take it?

___ It did not affect me or it did not happen.
___ I got over it in a few hours.

___ I got over it in a few days.

___ I got over it in a week.

___ It will take me months to recover.

___ Not applicable; I have no friends.

13. Have you felt shy or uncomfortable with people in the last 2 weeks?

___ I always felt comfortable.

___ Sometimes I felt uncomfortable but could relax after a while.

___ About half the time I felt uncomfortable.

___ I usually felt uncomfortable.

___ I always felt uncomfortable.

___ Not applicable; I was never with people.

14. Have you felt lonely and wished for more friends during the last 2 weeks?

___ I have not felt lonely.

___ I have felt lonely a few times.

___ About half the time I felt lonely.

___ I usually felt lonely.

___ I always felt lonely and wished for more friends.

15. Have you felt bored in your spare time during the last 2 weeks?

___ I never felt bored.

___ I usually did not feel bored.

___ About half the time I felt bored.

___ Most of the time I felt bored.

___ I was constantly bored.

Are you a single, separated, or divorced person not living with a person of opposite sex?

___ Yes; answer questions 15 and 16.

___ No; go to question17.

16. How many times have you been with a date these last 2 weeks?

___ More than 3 times.

___ Three times.

___ Twice.

___ Once.

___ Never.

17. Have you been interested in dating during the last 2 weeks? If you have not dated, would you have liked to?

___ I was always interested in dating.

___ Most of the time I was interested.

___ About half the time I was interested.

___ Most of the time I was not interested.

___ I was completely uninterested.

FAMILY

Answer Questions 17- 22 about your parents, brothers, sisters, in-laws, and children not living at home. Have you been in contact with any of them in the last2 weeks?

___ Yes: answer questions 17 – 22.

___ No; go to question 21.

18. Have you had open arguments with your relatives in the past 2 weeks?

___ We always got along very well

___ We usually got along very well but had some minor arguments.

___ I had more than one argument with at least one relative.

___ I had many arguments.

___ I was constantly in arguments.

19. Have you been able to talk about your feelings and problems with at least one relative during the last 2 weeks?

___ I can always talk about my feelings with at least one relative.

___ I usually can talk about my feelings.

___ About half the time I felt able to talk about my feelings.

___ I usually was not able to talk about my feelings.

___ I was never able to talk about my feelings.

20. Have you avoided contacts with your relatives these last 2 weeks?

___ I have contacted relatives regularly.

___ I have contacted a relative at least once.

___ I have waited for my relatives to contact me.

___ I avoided my relatives, but they contacted me.

___ I have no contacts with any relatives.

21. Did you depend on your relatives for help, advice, money or friendship during the last 2 weeks?

___ I never need to depend on them.

___ I usually did not need to depend on them.

___ About half the time I needed to depend on them.

___ Most of the time I depend on them.

___ I depend completely on them.

22. Have you wanted to do the opposite of what your relatives wanted in order to make them angry during the last 2 weeks?

___ I never wanted to oppose them.
___ Once or twice I wanted to oppose them.
___ About half the time I wanted to oppose them.
___ Most of the time I wanted to oppose them.
___ I always opposed them

23. Have you been worried about things happening to your relatives without good reason in the last 2 weeks?

___ I have not worried without reason.
___ Once or twice I worried.
___ About half the time I worried
___ Most of the time I worried.
___ I have worried the entire time.

24. During the last 2 weeks, have you been thinking that you have let any of your relatives down or have been unfair to them at any time?

___ I did not feel that I let them down at all.
___ I usually did not feel that I let them down.
___ About half the time I felt that I let them down.
___ Most of the time I have felt that I let them down.
___ I always felt that I let them down.

25. During the last 2 weeks, have you been thinking that any of your relatives have let you down or have been unfair to you at any time?

___ I never felt that they let me down.
___ I felt that they usually did not let me down.
___ About half the time I felt they let me down.

___ I usually have felt that they let me down.

___ I am very bitter that they let me down.

Are you living with your spouse or have you been living with a person of the opposite sex in permanent relationship?

___ Yes, Please answer questions 26-31.

___ No, Go to question 32.

26. Have you had open arguments with your partner in the past 2 weeks?

___ We had no arguments and we got along very well

___ We usually got along very well but had some minor arguments.

___ We had many arguments.

___ We were constantly in arguments.

27. Have you been able to talk about your feelings and problems with your partner during the last 2 weeks?

___ I could always talk about my feelings.

___ I usually could talk about my feelings.

___ About half the time I felt able to talk about my feelings.

___ I usually was not able to talk about my feelings.

___ I was never able to talk about my feelings.

28. Have you been demanding to have your own way at home during the last 2 weeks?

___ I have not insisted on always having my own way.

___ I usually have not insisted on having my own way.

___ About half the time I insisted on having my own way.

___ I usually insisted on having my own way.

___ I always insisted on having my own way.

29. Have you been bossed around by your partner these last 2 weeks?

___ Almost never.

___ Once in a while.

___ About half the time.

___ Most of the time.

___ Always.

30. How much have you felt dependent on your partner these last 2 weeks?

___ I was independent.

___ I was usually independent.

___ I was somewhat dependent.

___ I was usually dependent.

___ I depended on my partner for everything.

31. How have you felt about your partner during the last 2 weeks?

___ I always felt affection

___ I usually felt affection

___ About half the time I felt dislike and half the time affection.

___ I usually felt dislike.

___ I always felt dislike.

CHILDREN

Have you had unmarried children, stepchildren, or foster children living at home during the last 2 weeks?

___ Yes; answer questions 32-35.

___ No; go to question 36.

32. Have you been interested in what your children are doing-school, play, or hobbies during the last 2 weeks?

___ I was always interested and actively involved.

___ I was usually interested and involved.

___ About half the time interested and half the time not interested.

___ I usually was disinterested.

___ I was always disinterested.

33. Have you been able to talk and listen to your children during the last 2 weeks? Include only children over the age of 2.

___ I was always able to communicate with them.

___ I usually was able to communicate with them.

___ About half the time I could communicate

___ I was usually not able to communicate.

___ I was completely unable to communicate.

___ Not applicable; no children over the age of 2.

34. How have you been getting along with the children during the last 2 weeks?

___ I had no arguments and we got along very well

___ I usually got along very well but had some minor arguments.

___ I had more than one argument.

___ I had many arguments.

___ I was constantly in arguments.

35. How have you felt towards your children these last 2 weeks?

___ I always felt affection.

___ I mostly felt affection.

___ About half the time I felt affection.

___ Most of the time I did not feel affection.

___ I never felt affection toward them.

FAMILY UNIT

Have you ever been married, ever lived with a *person of the opposite sex, or ever had children? Please check*

___ Yes; please answer questions 36-37.

___ No; go to question 38

36. Have you worried about your partner or any of your children without any reason during the last 2 weeks, even if you are not living together now?

___ I never worried.

___ Once or twice I worried.

___ About half the time I worried

___ Most of the time I worried.

___ I always worried.

___ Not applicable; partner and children not living.

37. During the last 2 weeks, have you been thinking that you have let down your partner or any of your children at any time?

___ I did not feel I let them down.

___ I usually did not feel that I let them down.

___ About half the time I felt I let them down.

___ Most of the time I felt I let them down.

___ I let them down completely.

FINANCIAL

38. Have you had enough money to take care of your own and your family's financial needs during the last 2 weeks?

___ I had enough money for needs

___ I usually had enough money, with minor problems.

___ About half the time I did not have enough money but did not have to borrow money.

___ I usually did not have enough money and had to borrow from others.

___ I had great financial difficulty.

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VITAE

Larry Wayne Featherston was born in Dallas, Texas, on February 6, 1975, the son of Lora Sue Featherston and Larry Wayne Featherston, Sr.. After completing his work at R.L.Turner High School, Carrollton, Texas in 1993, he entered Brookhaven Community College at Farmers Branch, Texas. He received an Associates of Arts and Sciences in 1996. Attending the University of Texas Southwestern Medical Center of Dallas from 1996 through 2000, he received the degree of Bachelor of Science with a major in Rehabilitation Services in August, 2000. During the following two years he was employed as a vocational evaluator at the University of Texas Southwestern Medical Center of Dallas, Dallas, Texas. In September, 2001 he entered the Graduate School of Biomedical Sciences at the University of Texas Southwestern Medical Center of Dallas. He was awarded the degree of Master of Science in June, 2005. In September, 2003, he was admitted into the University of Arkansas' doctoral program in Rehabilitation Education and Research, Fayetteville, Arkansas. In 2004, he married Jennifer Faye Bogard of Dallas. Both are currently working towards the completion of their doctorates in Rehabilitation Education and Research.

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