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Factors Associated with the Successful Transition of University Students with Learning Disabilities and Attention-Deficit/Hyperactivity Disorder

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled, "Factors Associated with the Successful Transition of University Students with Learning Disabilities and Attention-Deficit/Hyperactivity Disorder" submitted by Katherine Gitanjali Boyd in partial fulfillment of the requirements for the degree of Master of Science.

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ABSTRACT

This study explored factors associated with successful transition of post-secondary students with learning disabilities (LD) and Attention-Deficit/Hyperactivity Disorder (AD/HD) from high school. Success in the first semester of post-secondary was assessed by the student's final grades for each registered course. This study also involved a comparison between self-esteem, general and acute anxiety, as well as, learning and study strategies of first year college and university students. Factors related to academic success were examined to determine correlates of successful transition to post-secondary institutions. Specifically, six domains were examined: type of learning disability (academic and/or processing deficit), current academic situation (course load, program, class size, study habits, work habits), use of learning and study strategies (time management, information processing, selecting main ideas, study aids, self-testing, test strategies), academic history (high school GPA, previous post-secondary school attendance, participation in an orientation program for post-secondary), use of services from the Disability Resource Center (advisement contacts, test accommodation, adaptive technology, assistive services), and socio-emotional factors (self-esteem, levels of acute and general and anxiety).

Subjects for this study included 16 students (8 males aged 18-23 years old and 8 females aged 17 to 31 years old) accessing the services from the Disability Resource Center at the University of Calgary. All participants were diagnosed with LD, AD/HD, or a combination of LD and AD/HD. All participants were administered a 10-minute structured questionnaire, the Coopersmith Self-Esteem Inventories (SEI), the State-Trait

Anxiety Inventory Form Y (STAI), and the Learning and Study Strategies Inventory (LASSI).

Descriptive statistics and correlational data revealed no significant relationship between high school grades, self-esteem, anxiety, participation in extracurricular activities, and university GPA. Related samples t-tests and one-way ANOVAs were also conducted on the dependent variables of first semester, second semester, and first year university grade point average (GPA). Significant effects on university GPA were noted for a student's motivation to succeed academically, good use of time management skills, and the average use of support techniques and materials. Although a one-hour focus group on transition needs and adjustment to the university setting was held for exploratory purposes, no conclusions or trends could be ascertained due to the low participation rate.

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I dedicate this thesis to my mother and father.

TABLE OF CONTENTS

Chapter Page

LIST OF TABLES

CHAPTER I

INTRODUCTION

Technological advances and increased societal expectations for education, coupled with higher levels of sophistication in the workplace, have resulted in a dramatic increase in post-secondary enrolment. A bachelor's degree from a college or university is often a necessary prerequisite for success (Ryan & Price, 1992). Unfortunately, few empirical studies have been conducted which have identified a comprehensive predictive model for understanding the academic adjustment of university students with learning disabilities (LD). Research consistently shows that successful completion of a post-secondary education program is particularly problematic for the student diagnosed with a learning disability (LD). The nature of this type of disability is that it is likely to become apparent in academic settings and its impact increases as more demands are placed on the academic skills of the student. The fact that estimates of the incidence of LD range from 5 to 20% of the population (Gerber and Reiff 1994) indicates that research in this area can potentially have a large impact on our economy.

Adults with LD require a range of skills and abilities to manage their disabilities in education, training, employment, daily routines, and social interactions. Since the Individuals with Disabilities Education Act of 1990 (IDEA), interest in research on transition among youths with disabilities has increased substantially in the United States. This interest has not been paralleled in Canada, despite the incorporation of the Learning Disabilities Association of Canada in 1971. Canadian studies and statistics on

the transition of special needs populations to the university setting are few and far between. With an established failure rate between 66 and 92% (Rogan & Hartman, 1990; Vogel & Reder, 1999) for students with LD in university, the striking paucity of research in this area signals an urgent need for Canadian-based information on the transitional needs of post-secondary students. In order to promote transition-focused programs, the identification of proven practices and strategies that promote positive student outcomes is essential. Despite current legislative support for the educational rights of students with special needs, there is also a lack of research on the emotional and academic adjustment of students with LD to large post-secondary institutions. It is hoped that, with the identification of "best practices" to facilitate positive transition outcomes, changes to service delivery and content can be delivered by administrators and service providers (Kohler, 1996).

The purpose of this study was to explore factors associated with successful transition of post-secondary students with learning disabilities (LD) and Attention-Deficit/Hyperactivity Disorder (AD/HD). It was hypothesized that several background factors were important for successful adjustment to university. These included the type of learning disability (academic and/or processing deficit) or AD/HD subtype, use of medication, academic history, and perceived social support. This study also involved a comparison between self-esteem, general and acute anxiety, learning and study strategies, and success of first year university students with LD and AD/HD. According to Coopersmith (1987), self-esteem is defined as "an attitude of approval or disapproval and indicates the extent to which a person believes him- or herself capable, significant, successful, and worthy" (p.5). In this study, assessing the subjective feeling of tension,

apprehension, nervousness and worry, also known as anxiety, was studied in two forms: trait and state anxiety. Spielberger (1983) describes trait anxiety as "relatively stable individual differences in anxiety proness" (p.1) while state anxiety was conceptualized as a situation-dependent level of anxiety. Learning and study strategies, another variable under examination, included "covert and overt thoughts and behaviors that relate to successful learning *and* that can be altered through educational intervention" (Weinstein, 1980, p.2). Success in the first semester of post-secondary was assessed by the student's final grades for each registered course.

Factors related to academic success were also examined to determine correlates of successful transition to post-secondary institutions. Specifically, five domains were examined: current academic situation (course load, program, class size); use of learning and study strategies (time management, information processing, selecting main ideas, study aids, self-testing, test strategies); academic history (high school GPA, previous post-secondary school attendance, participation in an orientation program for post-secondary); use of disabilility-related services (advisement contacts, test accommodation, adaptive technology, assistive services); and socio-emotional factors (motivation, attitude, concentration, self-esteem, levels of acute and general anxiety). Students were also invited to participate in a focus group to discuss their experience transitioning to the university setting. It is speculated that the results of this study will facilitate future academic success of LD and AD/HD students and the formation of transition programs and services for these populations.

CHAPTER II

RELATED LITERATURE AND RESEARCH

An increasing interest in research into the transition of students with special needs has manifested over the past decade. This has been paralleled by a resurgence in research on the academic needs of students with Learning Disabilities and Attention Deficit/Hyperactivity Disorder. However, research on factors associated with the academic success of this population at the post-secondary level is limited. Clinical symptoms experienced by adult students with LD and AD/HD, such as disorganization, poor decision-making skills, and poor time management (Patton & Polloway, 1982; Patton & Blalock, 1991), inhibit the use of learning and study strategies that are effective for students in achieving academic success in a university setting. According to the literature, students with LD and AD/HD are more likely to experience an increased level of frustration, heightened anxiety, and lowered self-esteem in their attempts to cope in an academic setting that is student- rather than teacher-focused (Hoy, Gregg, Wisenbaker, Monalitz, King, Moreland & Jagota, 1992; Patton & Blalock, 1996). The high failure rate and adjustment difficulties (Vogel & Adelman, 1992) experienced by these students as they transition to the university setting has provided the impetus for further research into this area of study.

Definitions of Transition

In 1994, the Division on Career Development and Transition (DCDT) of the Council for Exceptional Children adopted the following definition of transition:

> "Transition refers to a change in status from behaving primarily as a student to assuming emergent adult roles in the community. These roles include employment, participating in post-secondary education, maintaining a home, becoming appropriately involved in the community, and experiencing satisfactory personal and social relationships. The process of enhancing transition involves the participation and co-ordination of school programs, adult agency services, and natural supports within the community. The foundations for transition should be laid during elementary and middle school years, guided by the broad concept of career development. Transition planning should begin no later than age 14, and students should be encouraged, to the full extent of their capabilities, to assume a minimum amount of responsibility for such planning. (Halpern, 1994, p. 114)"

Alberta education (1997) recognizes that transitions occur at various times in a student's educational program. For instance, transitions need to be planned for school entry, for movement between levels of the school system and for school to post-secondary environments. Transition planning is defined as " a collaborative planning and implementation process for quality post-secondary education, employment and residential opportunities" (Alberta Education, 1996, p. 14) for students with special

needs. According to the Individuals with Disabilities Education Act (IDEA; P.L. 101-476):

> Transition services are defined as a coordinated set of activities for a student, designed within an outcome oriented process, which promotes movement from school to post-school activities, including post-secondary education, vocational training, integrated employment (including supported employment), continuing and adult education, adult services, independent living, and community participation. (Section 602(a)(19)).

Post-Secondary Transition Planning

Patton and Blalock (1996) describe the relationship that exists between Individualized Transition Planning (ITP) goals to Individualized Education Program (IEP) goals and objectives. Transition services are defined by DeStefano and Wermuth (1992) as a co-ordinated set of activities designed within an outcome-oriented process. Formal transition planning is typically incorporated into each student's IEP. ITP activities or objectives for the goal of attending an appropriate college program includes demonstrating self-advocacy regarding needed learning support, selection of an appropriate college through research of offerings from several colleges, and the selection of a major. The corresponding instructional IEP annual goals for demonstrating self-advocacy about learning support needs would include self-identification of learning strengths, learning needs and related supports, as well as, a discussion of needed learning supports with a high school counsellor. Patton and Blalock suggest that the IEP should include research of academic and support offerings

from no fewer than five colleges and that the selection of a major during the freshman year in college should incorporate several steps. To begin, participation and review of career/vocational and academic assessment with a teacher or counsellor is essential. Second, the importance of exploration of five occupational directions based on the assessment is emphasized. The final step includes the selection of a promising occupational area and the finding of a college match.

According to the Health Resource Centre (February 1997), transition planning must emphasize the development of a student's self-advocacy skills. Students need to identify appropriate persons and be able to express their needs in a reasonable and informed manner. Van Reusen and Bos (1994) suggest that student involvement in the development of their educational programs empowers and motivates students because involvement allows them to play a key role in the decision making process. Unfortunately, research on student involvement indicates that students are often not active participants when making decisions relating to transition and education (Lichtenstein & Michaelides, 1993; Peters, 1990). Transition planning should include identification of schools that offer training in the student's field of interest in addition to the provision of needed accommodations and special services.

The IDEA suggests that a student's IEP should include a statement of needed transition services beginning at age 16 or at age 14 if considered appropriate. Alberta Education (1996) states that formal transition planning should begin 3 to 4 years prior to graduation to avoid any disruption in service delivery and to foster successful achievement of post-secondary educational goals. When defining transition services in developing outcome-focused educational programs, this legislation focuses on

outcomes, students' preferences and interests, activities, and the collaboration between student, parent, and service provider (Kohler, 1996). The premise that transition planning should be a collaborative effort is echoed in a statement from Alberta Education (1995, p.1) which states that "the educational growth of a student is best accomplished through the mutual efforts of, and close communication among, the student, the family, the school, the community and other professionals involved with the student".

Nevada, Benz and Halpern (1993) identified significant discrepancies between identified student needs and services provided to Oregon students in a follow-up study on disabilities. They found that 25-50% of the identified needs of student participants were not addressed during the transition planning process and that students with learning disabilities and emotional disabilities were most likely to have their transition needs unmet. Another key finding was that one third to one half of these unmet needs occurred in the areas of social skills, remedial academics, post-secondary education, independent living skills, and vocational training.

Tottle's (2002) study found that high school students with LD rated themselves lower in abilities to communicate effectively using listening, speaking, reading, and writing skills. This suggests that it may be more difficult for students with LD to advocate to have their transition needs met. Tottle's research also found several themes to be related to the perception and beliefs regarding transition planning. First, students should have an active role in the development of a post-secondary transition plan. Second, parents play a vital role in providing background information and supporting students with the challenges of daily living and employment. However,

parents in this study indicated that they had minimal information or actual involvement in transition planning. Consequently, the importance and impact of parental support during transition planning needs to be investigated further. Finally, high schools appear to be the primary providers of transition services. This suggests that improvements in the delivery of transition services should begin or focus at the high school level.

Congruent with the above research findings, Stage and Line (1996) discuss the incorporation of a counselling model in the provision of transition-related services. Through academic advisements, personal counselling, career counselling, assessment and monitoring, a consistent support system can be developed for each student. The theoretical result would be a reduction in client anxiety levels and an increase in self-esteem among LD college or university students. However, Stage and Line's research does not indicate whether the implementation of their theoretical model has been proven to be successful nor how they would evaluate the success of their model.

In summary, current research in the area of post-secondary transition planning emphasizes the importance of the development of self-advocacy skills for the student with special learning needs. Students with LD and/or AD/HD must be active participants in transition planning and collaboration between parents, students, and service providers is essential.

Assessment of Learning Disabilities and AD/HD

In this study, the transitional needs of students with LD and AD/HD were researched to assist in transition planning to large post-secondary institutions. According Learning Disabilities Association of Canada (January 30, 2002), Learning

Disabilities are officially defined as " a number of disorders which may affect the acquisition, organization, retention, understanding or use of verbal or nonverbal information. These disorders affect learning in individuals who otherwise demonstrate at least average abilities essential for thinking and/or reasoning". A learning disability is often referred to as a "hidden" handicap. Those afflicted with such a disability show no visible signs or disfigurement to the public eye. A LD may encompass difficulties with receptive language (e.g., listening, reading), expressive language (e.g., talking, writing, spelling), mathematical computation, attention, co-ordination, language processing (e.g., thinking, integration, conceptualization), and self-control (Herriot, 1996).

According to the National Institute of Mental Health (2002), learning disabilities affect an individual's ability to interpret visual or auditory stimuli or to link information from various areas of the brain. White, Kovach, & Vosahlo (1993) claim that the discrepancy between assessed intellectual potential and academic performance is the principle symptom of a LD. Other academic sources suggest that all learning disabilities share the following characteristics: identification as a neurological dysfunction, atypical cognitive development, significant problems in academic performance, a pronounced difference between seeming potential and tangible academic achievement, average to above average intelligence, and the exclusion of other causes for poor academic functioning (Herriot, 1996).

The Diagnostic and Statistical Manual of Mental Disorders IV (1994) delineates three broad categories of learning disabilities. The first category is labelled as "developmental speech and language disorders" and may include more specific diagnoses of developmental articulation disorder (difficulties controlling rate of speech),

developmental expressive language disorder (problems in verbal communication), and developmental receptive language disorder (impairment in understanding particular aspects of speech). The second category of learning disabilities is academic skills disorders involving reading, writing and arithmetic. Students with a developmental reading disorder, also known as dyslexia, share an inability to distinguish or separate the sounds in spoken words (e.g., difficulties sounding out the individual letters in the word "bat" into "b-a-t"). This is a skill fundamental to the development of reading skills and for rhyming words without resorting to remedial reading techniques developed by specialists. Students diagnosed with dyslexia have difficulties forming images and associating new ideas to learned concepts, resulting in a lack of reading comprehension. Another form of academic skills disorder is the developmental writing disorder. Difficulties with sentence structure, spelling, grammar, word omissions, letter reversal, punctuation, capitalization, spacing, and poorly formed letters may lead to this type of diagnosis. Developmental arithmetic disorder, another academic skills disorder, is also characterized by neurological dysfunction affecting academic performance. In this scenario, students may have difficulties with reasoning, abstract concepts (e.g., fractions, place value), copying problems, aligning columns, memorizing basic facts (e.g., multiplication table), number sequence, operational symbols and may exhibit confusion or reversal of numbers. The final category of learning disabilities includes all other learning handicaps not covered by the other categories. This encompasses diagnoses of "motor skills disorders", "specific developmental disorders not otherwise specified" and "attention disorders". Diagnoses involving delays in acquiring language, academic, motor, co-ordination, spelling, and memory skills also fall under this category.

Although these diagnoses can affect the ability to learn, they do not meet the criteria for a specific learning disability.

Minskoff and DeMoss (1993) suggested a classification system for learning disabilities at the mild, moderate, or severe level. Students with a mild learning disability have limited processing and language deficits, above-average intelligence, adequate psychological adjustment and vocational/employability skills, and high academic achievement. A moderate learning disability would consist of some cognitive and language deficits, one or more academic disabilities, average intelligence, some psychological adjustment problems, and difficulties with vocational/employment skills. A classification of a severe learning disability includes significant cognitive processing and language deficits, below-average intelligence, low academic achievement, a lack of psychological adjustment, and a lack of vocational/employment skills.

A learning disability is legally defined as a significant gap between a person's intelligence and the achievement of skills at each age level. Learning disorders may be informally flagged if significant delays are observed in the child's skill development. A two year delay is considered significant when a child is in primary school whereas learning disabilities for older students are not suspected unless the delay exceeds two years. However, actual diagnoses of learning disabilities depends on using standarized tests comparing the child's level of ability compared to age norms (National Institute of Mental Health, 2002). Diagnosis of speech and language disorders involves developmental comparisons made by a speech therapist in the areas of language pronounciation, vocabulary and grammar. Physicians and audiologists are often consulted to rule out auditory problems, vision, ear infections, vocal cords, throat, etc.

Psychological tests are administered to determine the child's intelligence. In the case of academic skills disorders, standardized tests are used to determine academic development in reading, writing, and math. Learning styles inventories may yield data on preferences for learning conditions. This can then be related to current instructional planning and post-secondary education decisions (Patton & Blalock, 1996). Personality assessment procedures reflect the degree of adjustment in emotional or behavioral domains, with an emphasis on highlighting areas of strength (Patton & Blalock, 1996). Information obtained through learning styles inventories and personality assessments can be used in instructional placement decisions and areas for guidance and counselling.

According to the National Institute of Mental Health (2002), attention disorders, with or without hyperactivity, are not considered learning disabilities in themselves but often accompany academic skills disorders. Attention problems in adults such as difficulties with organization, work completion, listening, following direction, careless and messy work can seriously interfere with school performance, both academic and social. Age-inappropriate degrees of inattention and impulsivity with or without hyperactivity may be observed in conjunction with inconsistencies in performance over time and selective attention. A diagnosis of AD/HD is made only if the student shows such behaviors to a degree that substantially exceeds the norms of same aged peers.

Attention-deficit hyperactivity disorder (AD/HD) is one of the most serious and pervasive developmental disabilities of childhood. Attention Deficit Hyperactivity Disorder (AD/HD) is a neurobiological syndrome which is characterized by attention span difficulties, distractibility, impulsivity, restlessness, excessive motor activity as well

as difficulties sustaining attention, ignoring distracting stimuli, inhibiting impulsive responses (Amen, 1995; Carlson, Pelham, Milich & Hoza, 1993). Clinically, students with AD/HD are more prone to poor academic performance, poor self-esteem, excessive movement, impulsive behaviours, aggression, oppositional behaviour, social isolation and inability to focus and concentrate on selected tasks. Although there is no known cure, the condition can be ameliorated (Whalen, 1989). These problems appear to be the most salient in the classroom setting. Individuals with AD/HD often fail to finish assigned tasks, typically achieve below expected levels, and have a very high rate of concurrent learning problems. According to Amen (1995), students diagnosed with AD/HD are disorganized, restless, fidgety, and are easily distracted by extraneous stimuli. They frequently talk with classmates at inappropriate times, are often out of seat and have great difficulty completing independent seat work (DuPaul & Stoner, 1994). Further problems include taking turns, completing assignments, and great difficulties with sustained attention. It is unclear in current research the extent to which symptoms manifested in children with AD/HD extend to adults diagnosed with AD/HD. It is known, however, that symptoms of AD/HD are often more pronounced in the typical classroom setting due to the structured schedule, attentional demands, and reduction of physical movement (American Psychiatric Association, 1987).

Three medications are typically administered in the treatment of attention disorders (National Institute of Mental Health). These are Ritalin (methylphenidate), Dexedrine (dextroamphetamine), and Cylert (pemoline). These drugs are stimulants that temporarily improve attention and the ability to focus. They can also help to control impulsiveness and other hyperactive behaviours such as distractibility. The drugs are

administered by a doctor or psychiatrist and are effective for 3 to 4 hours and move out of the body within 12 hours. The dosage and medication schedule are carefully adjusted by a professional. Typically, the drug is taken during peak school hours. Psychostimulant medication are routinely included in treatment programs for children and adults with AD/HD (Pelham et al., 1992). In this study, six out of ten participants diagnosed with AD/HD took either Ritalin or Dexedrine to control their symptoms.

A Comparison Between High School and University

For many students, the transition to the post-secondary school environment represents a significant life event. According to Brinkerhoff, Shaw, and McGuire (1996), the post-secondary environment differs both qualitatively and quantitatively from the demands placed on students in high school. It is for this reason that students transitioning to university from high school must be prepared emotionally for a drastic environmental change. University instructional time for a regular course load is typically 12 to 15 hours per week compared to 25 to 30 hours of high school instruction. Personal responsibility and independence is critical to the post-secondary school experience as the student shifts from a student-centered mode of learning in high school to a teacher-focused mode of learning. The emphasis in academic post-secondary institutions appears to be on independent reading and study time, and student responsibility for decision-making (Shaw, Byron, Norlander, McGuire, & Anderson, 1989). At the post-secondary level, students are expected to: "balance personal freedom with the need to set personal goals; work on semester projects; glean information from numerous sources including class notes, texts, and library reference

materials; and, in general, function autonomously" (Brinckerhoff, Shaw, & McGuire, p. 72-73).

Students with LD may be confronted with many more challenges compared to their peers without LD upon entrance to a post-secondary institution. The inherent differences in the structure of the high school setting versus the college setting include differences in class time, class size, study time, tests, grading, teaching, and freedom. For students living on campus, they must learn to live, work, and socialize in a residential setting with other students for the first time (Ryan & Heikkila, 1988). If students have existing problems with self concept, social skills, or interpersonal interactions, being away from the familiar support of family and friends may lead to heightened anxiety (Brinckerhoff, Shaw & McGuire, 1993). Students with learning disabilities often report great difficulties in performing in-class exams and papers, with more difficulties in grammar, spelling and neatness compared to formulating ideas and concepts (Goldberg & Zern, 1982). In comparison, the ability to plan and follow a sequenced schedule of activities is associated with the academic success of students with AD/HD (Wallace, Winsler & NeSmith, 1996).

The format of educational planning is one of the most dramatic differences between secondary and post-secondary school. In high school, teachers, counsellors, and parents are mainly responsible for writing the Individualized Education Program (IEP) and determining learning issues and needed accommodations for the student. In the university or college setting, the burden falls on the student to make their accommodation needs known to the teachers (Synatschk, 1995). In conclusion, due to the vast structural institutional differences between high school and university, service

providers must emphasize the importance of student responsibility and autonomy in test preparation and assignment completion at the university level.

Attendance in Post-Secondary Education

The drastic differences between the high school and university environment may impact the decision of students with LD and/or AD/HD to pursue post-secondary education. Post-secondary education is defined as any education beyond high school. This may include trade or business schools, colleges, universities, vocational-technical schools, and adults and continuing education programs. According to research by Wagner, Blackorby, Cameto, Hebbeler, and Newman (1993), 12% of students with LD attend 2-year colleges, 4% attend 4-year colleges and 16% attend vocational schools within 5 years of leaving school. The American Council on Education reported an increase in the percentage of first-year students with learning disabilities from 15% in 1988 to 32% in 1994 (Vogel, Leyser, Wyland & Brulle, 1999). Fairweather and Shaver (1991) looked at post-secondary school attendance and found that 21% of students with disabilities enrolled in a post-secondary program compared to 64% of youth without disabilities. The breakdown of the disability category shows us that youth with LD constituted the smallest proportion at 17%. In a 1996 study, Blakorby and Wagner noted that only 14% of youth with learning disabilities had obtained some form of post secondary education two years after exiting high school, compared to 53% of youth in the general population. The National Longitudinal Transition Study (NLTS) found an average participation rate of 14% for all school leavers with disabilities (N= 1,741) within two years of leaving high school (Wagner, D'Amico, Marder, Newman & Blackorby,

1992). Individuals with physical or sensory disabilities had higher participation rates (28%-36%) compared to people with cognitive, emotional, or severe disabilities (4%-17%. Bursuck and Rose (1992) reviewed the literature in this area and found that participation rates ranged from 9% to 50% in samples of students with disabilities pursuing post-secondary education. Fairweather and Shaver (1991) researched post-secondary school attendance using data from the National Longtitudinal Transition Study. Fifteen percent of the participants with disabilities reported taking any form of post-secondary education compared to 56% of the youth without disabilities. Students with learning disabilities comprised 17% of the group with disabilities.

Halpern, Yovanoff, Doreen, and Benz (1995) studied predictors of participation in post-secondary education for school leavers with disabilities. They found six predictors associated with participation in a post-secondary program: (a) participation in transition planning, (b) parent satisfaction with instruction received by the student, (c) parent perception that the student no longer needed help in certain critical skill areas, (d) successful completion of instruction in certain relevant curricular areas, (e) high scores on a functional achievement inventory, and (f) student satisfaction with instruction received. The results of their study showed that 58% of their Oregon/Nevada sample (N=422) and 62% of their Arizona sample (N= 565) participated in a post-secondary program. These figures may have been inflated due to "participation" being defined as all forms of post-secondary education and training, including programs specifically designed for people with disabilities. Upon further examination, only 7% in the Oregon/Nevada sample and 3% of the Arizona sample participated in a 4-year college.

Completion rates for college and university programs are low among students with LD and AD/HD. Approximately 18.1% of adults with learning disabilities enrol in a 2- to 4-year college program (Wagner, 1993) but have difficulties completing their post-secondary education. According to Aune (1991), students with LD are often ill prepared for the academic demands in the post-secondary setting due to inadequate participation in college preparation classes during high school, and skill deficiencies. Marder (1992) completed a survey among students with learning disabilities who attended post-secondary. This researcher found that only 15.9% of these students were full-time and that only 14.5% completed a degree (11,1% at post-secondary vocational schhools, 2.9% at 2-year colleges, and 0.4% at 4-year colleges). These shocking statistics have provided the impetus for research into the transitional needs special-needs students.

In 1985, a report from the American Council on Education stated that 1.1% of all first-time, full-time freshmen acknowledged having a learning disability (Henderson, 1995). That percentage had nearly tripled by 1994, reaching 3%. Wagner, Newman and Blackorby (1993) found that 3 to 5 years after high school exit, only 30% of students with LD had enrolled in a post-secondary program. Of this 30%, only a half percent would complete their program or earn a degree. It appears to be evident that these individuals are struggling to meet the demands of a post-secondary education and measures must be taken to ensure academic success.

In 1998, Vogel, Leonard, Scalen, Hayeslip, Hermansen, and Donnells surveyed 147 institutions with a combined total of 7,827 students with LD. These researchers determined that the incidence of students with LD who self-identified as having a LD

was 0.7% of the total student body of all participating institutions. Smaller institutions with less than 4,999 students, reported a significantly higher proportion of students with LD (mean = 2.06%) as compared to the larger post-secondary institutions with more than 20,000 students (mean=0.58%). When these researchers broke down the institutions by type, they found that community colleges and 4-year independent colleges had a higher proportion of students with LD (mean = 3.01%), compared to public universities (mean = 0.65%). Of notable interest was that the type of support services offered at an institution did not have a significant impact on the number of students with LD in attendance.

In summary, it appears that a university education is not currently considered a favourable option for students with LD and/or AD/HD. With university participation rates ranging from less than 1% (Marder, 1992) to a high of only 7% (Halpern et al., 1995) and completion rates at 0.4% (Marder, 1992), it seems plausible to suggest that the provision of external support systems is essential.

Academic Failure

The increase in the number of students with LD and AD/HD attending university over the past decade has spurred a commensurate concern among service providers regarding the academic failure rate of these special-need students (Vogel & Adelman, 1992). In a survey of 914 high school graduates with learning disabilities by Sitlington and Frank (1990), of the fifty percent of participants in their sample that had enrolled in a post-secondary program, only six percent were still attending school one year later. Research findings also show that, compared to non-learning disabled post-secondary

students, the mean cumulative grade point average of students with learning disabilities is often significantly lower (Wilczenski, 1993). Rogan & Hartman (1990) completed a longitudinal study of students and found that only 34% of students with LD actually completed their post-secondary program. Vogel and Reder (1999) paint a more somber picture in their study with the discovery that only 8% of individuals with LD completed their undergraduate degree. The significant increase in the last ten years in the numbers of students with learning disabilities pursuing post-secondary education and the lack of success and academic failure rate of these students is of concern to professionals in the field.

In the academic arena, adults with LD reported having significant problems with reading, spelling, arithmetic, written composition, and handwriting. The nature of this type of disability is such that it is likely to become apparent in academic settings and the impact increases as more demands are placed on these skills. Most college courses rely heavily on verbal skills (e.g.,understanding lectures, reading textbooks and related literature, writing papers, pacticipating in discussions, and making oral presentations) (Stage & Milne, 1996). Looking at research on the characteristics of students with LD at the post-secondary level, it is apparent that these students often have poorly developed study and time management skills (Brinckerkoff, 1996; Block, 1993; Wong & Jones, 1992), difficulties making independent decisions and problem solving (Wilson, 1994; Gajar, 1994; Getzel & Gugerty, 1992), and difficulties completing the reading and writing requirements for post-secondary work (White, 1996; Brinkerhoff, 1996). Interestingly, these research studies also showed that standardized college entrance examinations were not necessarily a valid predictor of college grade-point average and graduation.

Success at the post-secondary level is dependant not only on intellectual abilities but on social abilities as well. Reading comprehension and reading rate were the greatest area of difficulty for students with LD (Hugues and Smith, 1990; Vogel (1986); Synatschk, 1995). Results from research by Synatschk (1995) were consistent with the findings of Houck, Engelhard, and Geller (1989) which found that areas of deficit for students with LD were in reading and written expression, visual processing, and short-term memory. Several students also reported experiencing difficulties in math application and reasoning. Synatschk's (1995) study also showed that when college students with LD were compared with students without disabilities, they were not as fluent in word production and in the number of words used in their compositions. Among students in their study with LD, there was great variability in skills relating to oral expression and social abilities. All students placed a high value on social skills, which included the ability to self-advocate and negociate. They noted that they all made a conscious effort to compensate for areas of deficit by utilizing an area of strength.

In conclusion, it appears that many of the contributing factors to the low program completion rates for university students with LD and/or AD/HD are skills that can be altered through instructional remediation. These include study and time management skills, effective decision-making, skills in written and oral expression, reading comprehension, and social proficiency.

AD/HD and Academic Success

The literature on factors associated with academic success of AD/HD at the post-secondary level is very limited. Presnell's (2000) research showed that university

students reporting severe childhood AD/HD symptoms had lower self-esteem. In an extensive literature search to find studies specific to the topic of transition of students with AD/HD to university, only one study could be found. Wallace, Winsler, and NeSmith (1999) explored factors associated with college success among students with attention deficit hyperactivity disorder (AD/HD). The fourty-four University of Alabama students in their study completed a 107-item survey. The issues examined included planning and scheduling of activities, focusing of attention, study habits, social relationships, helpseeking, and comorbidity of other learning difficulties. Three factors were found to be associated with academic success; feelings of self-confidence, age (older students did better), and the ability to plan and follow a sequenced schedule of activities. No significant differences among students with only AD/HD and students diagnosed with additional learning disabilities were noted. Of interest was that assistance at the high school and college levels did not impact academic success.

High School G.P.A. and Use of Services as Predictors of Academic Success

The question of the impact of academic performance in high school on academic success in post-secondary has been an important factor in university admission. Several studies have found high school grade point average (GPA) to be a good predictor of academic success at the post-secondary level. According to Wilczenski and Gillepsie-Silver (1992), high school percentile rank in class predicted first year university GPA among 179 students with LD and 249 students without LD. However, they noted in their study that a subgroup of LD students maintained a higher academic standing than predicted by their high school academic record. Vogel and Adelman

(1990) also found that that the number of regular (rather than remedial or developmental) English and math high school courses completed with a grade of C or better and the total number of D and failing grades received in high school was highly correlated with college exit GPA. In Ziomek and Andrew's (1996) study on predicting college grade point averages from American College Testing Program assessment scores and High school grades, the correlation between predicted and actual GPAs was highest for students diagnosed with AD/HD.

In the present study, academic success was assessed through an examination of university GPA. The utilization of support services and its relationship to GPA was also examined. Previous research by Vogel and Adelman (1992) has compared the educational attainment of college students with learning disabilities (n=62) to a matched sample of 58 of their peers without learning disabilities. Both groups were native English speakers and were enrolled in a degree program in a small midwestern college. They examined the correlation between correlation between high school GPA and college exit GPA. Similar to their previous studies, they found that the best predictor of college exit GPA was the completion of a number of regular high school English courses with a grade of C or better ($r=.46, p<.001$). In addition, for the student with LD, the fewer the number of Ds on the high school transcript, the higher the college exit GPA.

In Vogel and Adelman's study (1992), the use of support services and advisors seemed to be effective in reducing the risk of failure and lessen the impact of academic and basic skills deficits. The advisement tasks of the LD specialist include closely monitoring academic performance, assisting students in monitoring deadlines,

determining the right course load, and identifying instructors who are sensitive to the needs of students with disabilities. Students with LD in Vogel and Adelman's (1992) study received significantly fewer failing grades than the comparison group and there were no significant GPA differences between both groups. It is important to note, however, that students with LD in this study took a lighter course load compared to their peers and took an average of 6 years, one year longer than their peers, to complete their undergraduate degree. An interesting finding is that 100% of the students in both groups who failed academically were first-year post-secondary students. The authors concluded that failure may have resulted from an inability to compete in an academically competitive environment and/or to meet the demands of college life. Failure among students with LD was apparently due to the lack of use of accommodations and services as well as recognizing the effect of their learning disability on their academic performance.

Post-secondary students with learning disabilities may experience problems with memory, reading, listening, math, written language, and organization. Consequently, successful selection and use of assistive technology at the post-secondary level is important to the fulfilment of an individual's educational aspirations. These devices circumvent a student's deficits and therefore enhance the student's learning abilities. According to Garner and Campbell (1987), the two major purposes of assistive devices is to perform a compensatory function and a remedial function. In the compensatory approach, assistive technology helps the student to perform a specific task and thereby circumvent a deficit. In the remedial approach, assistive technology improves areas of deficiency. It is important for students to be knowledgeable about various types of

devices and for specialists to be familiar with issues related to training and device selection.

Garner and Campbell (1987) suggest that accommodations may be grouped into two categories: instructional modifications and exam modifications. Instructional modifications may include taped textbooks, assistive technologies or note-taking by either volunteer note-takers, tape recording lectures or use of a computer in class. According to Day and Edwards (1996), technologies available to students with learning disabilities also include abbreviation expanders (programs that allow students to type abbreviations for frequently used words and phrases and produce the complete word or phrase by pressing the space bar), variable speech-control tape recorders, optical character recognition systems (machines that read), listening aids for students with auditory deficits (has a microphone and headset), and data managers (technological system that stores personal information to aid students with organization and memory problems). Exam modifications may be in the form of extended exam time, use of a private room, alternative format tests, use of a scribe or use of assistive technologies. Assistive technologies include the use of talking dictionaries, talking calculators, speech recognition systems (system that allows the student to operate a computer by speaking into it), speech-synthesis/screenview systems (voice output systems that reads text displayed on the computer screen), scanners, electronic organizers, and word processors with software for spell checking, grammar checking, and proof reading. According to Synatschk (1995), a useful academic strategy for students with LD include appropriate reliance on tutors, proofreaders, calculators, editors, recorders, and computers. Smitley's (2001) research into predictor variables for academic adjustment

among college students with LD found several variables accounted for over 60% of the variation noted in academic adjustment. These included test strategies, task management strategies, institutional attachment, verbal IQ, and the use of tutoring. Contradictory research findings were found by Sarver (2001) who found no significant correlation between university GPA for students with LD and the number of disability accommodations granted them by the university. Positive effects of assistive technology noted by researchers include greater independence and relief from anxiety for students with LD (Barton and Zfuhrmann, 1994), a heightened sense of self-esteem (Raskind, 1994), and a regaining of self-control as the student gains competency with the aid of technology (Reiff, Gerber, & Ginsberg, 1992).

Keim, McWhirter, and Bernstein (1996) looked at the relationship between the use of academic support services and academic achievement among 125 university students with learning disabilities. They found that while tutoring and test accommodation was not significantly related to higher cumulative grade point average, utilization of computer laboratories and advisement at low levels did correlate with academic success. Results from a previous study by Cowen (1988) contradict these findings in that use of remedial and tutorial services was considered helpful in self-reports by students with learning disabilities in completing required course material in their core area of deficit. Vogel and Adelman (1990) also found that use of comprehensive, highly co-ordinated support services, including special academic advisors, contributed to an increased graduation rate and a decrease in the failure rate of students with learning disabilities. In comparison, one study by Wallace, Winsler, and NeSmith (1996) found that assistance at the college level was not related to academic

success of AD/HD university students. Survey results from 151 university undergraduates indicated that students who self-reported high symptoms of AD/HD used fewer coping strategies than those reporting low AD/HD symptoms (Turnock, Rosen, & Kaminski, 1998).

Vogel and Adelman (1990) found similar college graduation rates among students with learning disabilities (37%) compared to their non-disabled peers (39%). This study also found that both groups of students graduated within the same time frame of 6.5 years and an almost identical failure rate (LD 17% and nonLD 18%). It is important to note, however, that these statistics were based on students with self-identified learning disabilities who were highly motivated to succeed in college, and used comprehensive, highly co-ordinated support services.

Studies on reading comprehension and use of tutorial services have yielded interesting results. Runyan (1991) completed a study on reading comprehension between 16 students with learning disabilities and 15 normally achieving students without LD. This researcher found a significant difference between both groups on reading comprehension scores under timed conditions but no significant differences with added time for both groups. Interestingly, the use of tutors yields contradictory results. In Stage and Milne's (1996) research, tutors were most often mentioned in a negative light. Prospective tutors were academically talented students without knowledge of teaching techniques or learning disabilities. In addition, financial hardships would result when tutors charged more than what the Disabled Student Services office would provide.

In summary, the literature does seem to support the premise that high school G.P.A. and the use of disability-related services influences post-secondary academic success. Specifically, college exit G.P.A. appears to be positively correlated with English and math high school marks and negatively correlated with the number of 'D' or failing grades received in high school. The lack of use of accommodations and assistive technology also increased the likelihood of academic failure whereas the use of tutorial services yielded conflicting results. Of interest is the finding that use of highly co-ordinated support services is helpful for students with LD but not for students with AD/HD.

Coping and Learning Strategies

It has been concluded repeatedly in the literature that students with LD often lack the content preparation for college success (Cowen, 1991; Dalke & Franzene, 1988; McGuire, Norlander & Shaw, 1990). They are also likely to be lacking in learning strategies instruction to allow them to generalize their skills across settings (Bursuck, 1991; Deshler & Schumaker, 1986).

Synatschk (1995) describes a phenomena called "social-psychological adaptation processes", defined as behaviours in response to confrontation of a life event. These may include coping strategies to manage academic demands and the use of accommodations. Successful students in her study developed individualized systems to manage large amounts of reading, class content, testing, writing, and course load demands. Reading strategies ranged from using texts on tape, reading only the summary portions of text, splitting reading assignments with partners, using volunteer

readers, rereading material up to four times, and reading assignments prior to the beginning of the course. Effective study strategies included establishing study groups to divide the work and provide oral discussion of text and lecture content, connecting new knowledge to past learning experienced, and studying for longer amounts of time compared to peers.

To cope with class demands, all of the students in Synatschk's (1995) study agreed that it was necessary to attend every class and useful to tape lectures, borrow notes from others, copy all written comments made, and buy notetaking services. Students found that extended time for test-taking was useful. Use of an editor or proofreader for correcting spelling and grammatical errors was also a popular strategy. Many strategies were used to deal with managing the university course load. The accommodation of priority registration allowing the student to select instructors and times of classes helped them to fit their learning needs. The primary advantages were avoidance of too many reading-intensive courses in the same semester, and a reduced course load. However, it is unclear what effect this strategy had on grade point average.

The results of Stage and Milne's (1992) study also showed that learning disabilities had a negative influence on reading, writing, organization of thoughts, and processing info. Mathematics, foreign language, and political science courses were repeatedly mentioned as particularly problematic for the students interviewed. Coping tactics ranged from various exercises to relieve stress to various types of study schemes to methods for handling their own feelings of inadequacy. Time was frequently mentioned as an enemy of the students who quickly learned that they did not

have time to apply every study strategy to every class. The most common strategy mentioned was putting in greater amounts of time than their peers on their coursework. Some students used strategies such as never reading the text and concentrating on lectures. For others, that meant never going to class and reading every book on the subject. Still others effectively combined the two approaches. Other strategies included underlining what the professor emphasized so it could be highlighted in review; constantly reviewing material; making a daily routine of classes, studying, tutoring, and free time that worked well; blocking out time for certain assignments; spending time at the library in a "study" atmosphere; and setting goals such as short-term daily checklists as well as long term career oriented goals. Some students relied on a tutor, while others relied on a friend or family member for help with particular subjects. A strategy commonly suggested for students with learning disabilities is to make a tape-recording of the lecture for later review and note taking (Stage & Milne, 1996).

Stage and Milne (1996) explored experiences of college students with learning disabilities as well as the ways in which they adjusted to college. Eight undergraduate students with LD were selected by the director of Disabled Student Services and Veteran Affairs. Criteria used by the director in consultation with the researchers included choosing students with a range of learning disabilities who were at various points in their academic career and used the services provided by the disabled student services office. Fifty percent of the respondents were male and the age of all participants ranged from 19 to 30 with G.P.A.'s ranging from 2.26 to 3.64. Three of the students were diagnosed with a single learning disability in reading. Two students were

diagnosed with language and math disabilities and two students had dyslexia in addition to a disability in math. The last participant had both reading and math disabilities.

These researchers looked at strategies used by students with LD in order to compensate for their disabilities. Students in their study pointed out that they did not have time to apply every study strategy to every class. Students were forced to focus on their strengths. For some, this resulted in a strategy of concentrating on lectures and never reading the text. Other strategies included spending time at the library in a "study" atmosphere, using short-term daily checklists, reliance on a tutor or friend, and making a daily routine of classes, studying, tutoring, and free time. Two common themes emerged from this research. The first was a high level of motivation combined with a realistic perception of their strengths and weaknesses. The second was the skepticism and resistance encountered when students requested special accommodations. It is unclear if these strategies promoted resiliency among this population of students.

Stage and Milne (1996) also did extensive research on institutional factors affecting adjustment to post-secondary. Institutional factors included aspects of the university that helped or hindered students' progress toward their goals. Each student was able to recount positive instances of helpfulness, concern, and accommodation for their learning disability. However, not all faculty were sensitive to the needs of students with LD. Some faculty and associate instructors were unwilling to allow extra time for examinations and papers, even when the student had requested such arrangements at the beginning of the semester. The advantage of a one-to-one interaction between student and faculty member was an important factor in a student's success for that

class. Obviously, the university's large class size often interfered with those relationships. Sometimes tutors were able to fill an important personal role in students' academic lives. Most often, however, tutors were mentioned in a negative light. Tutors often had no knowledge of teaching techniques nor of LD and were simply academically talented students.

In addition to problems with tutors, most students reported having difficulties paying for the tutoring and this created financial hardships. Some students were very open about their disabilities and had a wide range of friends, others associated primarily with other students with disabilities. At least half the students were reluctant to share information with others. The students were often reluctant to participate in classroom experiences that might demonstrate their disability in front of an audience. Students had refused to answer questions, to read, to write on the board, or to participate in some kinds of group learning activities. A common trait of these students seemed to be a high level of motivation coupled with a realistic view of their own possibilities. Another aspect of students' disposition, frequent expressions of anger, resulted from students' interactions with faculty and peers. A primary source of irritation was due to misperceptions about them and their disability. Because their disabilities were invisible, members of the faculty were often skeptical and resistant to students' requests for special accommodations. (Stage & Milne, 1996)

The development of coping and learning strategies appears to be an individualized process for students. To develop compensatory and academic strategies, students must possess the motivation to succeed academically, as well as, an awareness of their own strengths and weaknesses. Common strategies include

consistent class attendance, the use of priority registration, proof reading written assignments, compilation of comprehensive lecture notes, and effective time management skills.

Socio-Emotional Factors

One of the main research interests in this study was the emotional factors affecting university transition. A study by Hoy, Gregg, Wisenbaker, Monalitz, King and Moreland (1997) revealed that college students with learning disabilities had increased anxiety-related symptoms compared to a matched sample in a rehabilitation setting who were not attending college. Saracoglu, Mindem, and Wilchesky (1989) found that the 34 university students with learning disabilities in their study had significantly poorer self-esteem compared to 31 controls without learning disabilities and that this variable correlated positively with adjustment to university. Dowdy, Carter, and Smith (1990) concluded that students with learning disabilities enrolling in programs leading to advanced degrees often enter these programs poorly prepared emotionally and academically. For students with AD/HD, feelings of self-confidence have been associated with academic success at the university level (Wallace, Winsler, & NeSmith, 1996). Stevens' (2001) research showed that students with LD reported significantly higher levels of test anxiety compared to their peers. He found that use of support services was related to a higher GPA and that these services were perceived as useful by anxious students. Ironically, utilization of such services did not mitigate generalized test anxiety.

In the psychosocial area, years of internalizing labels of stupidity and incompetence and experiencing dependence, fear, anxiety, or helplessness can decrease an individual's self-esteem. Stage and Milne (1996) studied dispositional factors related to post-secondary transition. Dispositional factors included attitudinal or behavioural characteristics of the students that affected their experiences in college. The most important attitudinal factor was the individual student's self-perception. Each of the students in this study reported negative feelings of self-consciousness. As a result they were reluctant to let others know of their disabilities. Some students attributed this self-consciousness to years of believing that they were not trying hard enough. They had been told that they were using their disability as an excuse and had received negative reactions from others. Those reactions sometimes caused them to wonder whether their disability was "real". As a result of these attitudes or dispositions, students modified their behaviours in academic settings in ways that might have thwarted their academic progress. Often they did not participate fully in classroom activities. Some students, however, were able to use participation in class to their advantage; they had modified their behaviour in some classes to compensate for their disabilities. An internal impetus to succeed at college work was a prime factor in their university experience. Unanimously they took responsibility for their college status and attributed their drive and ambition to a number of factors (e.g. sick of getting bad grades, sick of teachers not understanding, showing themselves that they could do it). The students seemed uniquely able to recognize their own accomplishments, no matter how small, and to reward themselves by cherishing such achievements.

Gregg, Hoy, King, Moreland, and Jagota (1992) compared the personality profiles of adults with LD attending a large state university (8 females, 8 males, mean age between 20-23) to those participating in training programs in a rehabilitation setting (8 females, 18 males) in an attempt to identify affective variables that should be considered in transitional and post-secondary program planning. A second purpose of the study was to compare the performance of these two groups to a normative group of college students. Mean age of all subjects was between 20-23. Findings indicated that the personality profiles of individuals with LD I either a rehabilitation setting or seeking a university degree are significantly different from those of the normative population of normally achieving college students. The university group's profile indicated feelings of fear, obsessive thoughts, lack of self-confidence, self-doubt, and extreme self-criticism. Both groups demonstrated profiles of individuals under extreme short- and long-term stress leading to anxiety.

Many college-bound students with LD do not understand their learning disability, its impact on their learning, or how to define it to others using plain language (Aune & Ness, 1991; Dalke & Schmitt, 1987; Goldhammer & Brinckerhoff, 1992). These students, after years of academic struggle in high school, may perceive themselves to be lacking any learning strengths or abilities, further lowering their self-concept (Patton & Blalock, 1996). In a study by Adlaf, Gliksman, Demers, & Newton-Taylor (2001), 30% of a national probability sample of 7,800 Canadian undergraduate students from 16 universities reported elevated psychological distress compared to the general population in Canada. Based on previously cited research, it is likely that this level of distress would be magnified for students with LD.

Nielsen (1997) investigated university students' perceptions of their LD and how the disabilities have affected and continue to affect them. Students were either currently using LD support or had used them earlier in their university careers. The perceived worst negative and social effects of the LDs were as individual as the participants but appeared to relate directly to the specific LDs. Various everyday tasks such as reading greeting cards, reading books to children, filling out forms, recreational word games, and job choices were often cited as difficult for the student with LD. Nielsen's research concluded that much of the schooling for persons with LD is clouded by frustration and embarrassment and that they may be seen as either intelligent students who are lazy or unmotivated or as students who simply are not academically capable of much.

Smith and Nelson (1993) studies factors viewed as important to academic success by college students with LD. The thirty-six college students with LD in their study identified factors under the personal beliefs category and the social support and climate category. These factors were discipline and effort (cited by 100 percent of their sample), acceptance of their disability (88 percent), family support (92 percent), personal ambition (72 percent), interaction with other students (70 percent), self-confidence (52 percent), prior knowledge and experience (33 percent), interaction with faculty (30 percent), and university support services (30 percent).

Many adults with learning disabilities have normal or above normal intelligence. They are able to devise extraordinary coping mechanisms to hide or overcome the disability (Hartman & Krulwich, 1984). However, individuals with LD often experience frustration and embarrassment throughout their school career. They are seen as either

intelligent students who are lazy and unmotivated or students who are not capable of succeeding academically. People with learning disabilities may experience a cycle of academic failure and lowered self-esteem, resulting in overwhelming frustration. Feelings of fear, lack of self-confidence, self-doubt, negative obsessive thoughts, and self-criticism also contribute to a negative self-image. Academic performance is further impacted negatively by the preponderance of anxiety-related symptoms and negative self-esteem that appears to be typical of students with LD and/or AD/HD.

Conclusion

There appears to be reason to be concerned about the adjustment of students with LD and AD/HD to post-secondary institutions. It is evident that students with LD often lack the content preparation for college success (Cowen, 1991; Dalke & Franzene, 1988; McGuire, Norlander & Shaw, 1990) and are not emotionally prepared for the academic demands of the university setting (Hoy et al., 1997; Stage and Milne, 1996). According to the literature, students with LD and/or AD/HD often have significantly poorer self-esteem, lower self-confidence, and higher levels of anxiety compared to their peers (Gregg et al., 1992; Stevens, 2001; Saracoglu et al., 1989). They are also likely to be lacking in learning strategies to allow them to generalize their skills across settings (Bursuck, 1991; Deshler & Schumaker, 1986). Levine and Nourse (1998) noted that the provision of physical and emotional support contributed greatly to the success of students with LD in their study. Consequently, the determination of factors related to successful academic adjustment to university is needed to ensure the success of transitional programs for this population.

CHAPTER III

METHOD

The review of the literature gives rise to several questions related to the identified variables of self-esteem, state and trait anxiety, learning strategies, gender, use of accommodations, extracurricular activities, medical treatment, participation in the University of Calgary Orientation Program (U of C 101), diagnosis, and high school grades. A review of the literature suggests that these variables are relevant to the study of transition to university for students diagnosed with AD/HD and/or LD. Based on the limited findings in transition-related research, several questions were explored in this study. These include:

(1) What is the relationship between self-esteem and anxiety on university grade-point average?

(2) What is the relationship between high school grades, use of academic accommodations, and the use of learning and study strategies on university grade-point average?

(3) What is the relationship between gender, participation in extracurricular activities, use of medication, diagnosis subtype, and participation in the a campus orientation program on university grade-point average?

Sample Selection

First and second year students accessing the services from the Disability Resource Center at the University of Calgary were contacted by phone and asked to participate in this study. Participants met the following criteria: 1) a diagnosis within the past 5 years of a learning disability from a qualified professional (i.e., psychologist); 2) no evidence of a neurological disorder; 3) no evidence of psychosis; and 4) no evidence of a severe developmental delay. Of the 44 students that agreed to participate in this study, 17 attended their scheduled appointments. One participant was later excluded from the study after refusing to answer test items. Consequently, a total of 16 students were included in the study (8 males aged 18 to 23 years and 8 females aged 17 to 31 years old).

Of the male participants, two were diagnosed with LD, three had AD/HD, and three were diagnosed with both AD/HD and LD. Among the male students diagnosed with LD, one had a reading and math disability, and the other had a diagnosis of dyslexia, a reading disability. One of the male participants with AD/HD had the combined subtype of AD/HD while the other two were waiting for a more detailed psychological assessment. Among the three students with both AD/HD and LD, one was diagnosed with the inattentive subtype of AD/HD without hyperactivity and learning disabilities in reading and writing. One participant had a previous diagnosis of AD/HD and LD but was waiting for a new assessment to determine the subtype of AD/HD and type of LD. The last male participant with both AD/HD and LD was diagnosed with AD/HD (subtype not known by the student nor included in the assessment report) and a

learning disability in math and spatial relations. Six of the male participants were first year students at the university of Calgary and two were second year students at U of C.

Of the female participants, two were diagnosed with a LD, two had AD/HD, and four were diagnosed with a combination of LD and AD/HD. Among the participants with LD, one had an incomplete assessment and the other was also diagnosed with Generalized Anxiety Disorder. Of the participants diagnosed only with AD/HD, no information was available to determine the subtype. However, these participants described their condition as "mainly problems with concentration and paying attention to lectures and readings". Among the four with combination diagnoses, two had the predominantly inattentive subtype of AD/HD with a LD in written expression, one had the predominantly hyperactive-impulsive subtype of AD/HD with dyslexia, and one female participant had the combined subtype of AD/HD with a LD in written expression. Five of the women in the study were enrolled in their first year at the University of Calgary and three were in the second year at the university. One participant in the study was a transfer student from another post-secondary institution. At the age of 31, she was the oldest student in the study and was in her second year at U of C. She was later excluded from the study when she refused to answer several questionnaire items because she was "unable to conceptualize the answers in a multiple-choice format".

Five participants agreed to attend the focus group. However, no one showed up on the scheduled date, despite a reminder call that had been placed the night before. On the second attempt to run a focus group, only one of these five participants actually attended the group. Two of the students who had participated in the study but chose not to attend the focus group when contacted, changed their minds at the last minute.

One of these students was the student who had been eliminated from the questionnaire portion of the study due to her unwillingness to answer test questions. Consequently, of the three students who participated in the focus group, only two completed all aspects of the study (Participants 1 and 2). All participants were females and Participant 1 and 2 were 18 years old, single, best friends, and living in Residence. The third participant was 31 years old and living in a "communal living" situation with her partner.

Materials

Three inventories were used to examine levels of self-esteem and anxiety and the use of learning/study strategies. The selected instruments are easily administered and scored, and are frequently used in post-secondary and clinical settings. A brief description of each inventory is provided below.

The Coopersmith Self-Esteem Inventories (SEI)(Coopersmith, 1987). The Adult Form of the SEI is a 25-item self-administered inventory requiring approximately ten minutes to complete. It was designed to measure self-esteem, defined by Coopersmith (1981) as "...an expression of approval or disapproval, indicating the extent to which a person believes him- or herself competent, successful, significant and worthy"(p.1). According to Adair (1984) in his critique of the Coopersmith Self-Esteem Inventories, high self-esteem has been positively correlated with "creativity, academic achievement, resistance to group pressure, willingness to express unpopular opinions, and effective communication between parents and youth" (p.228). The adult form of the SEI is designed for use with persons aged 16 years or older and requires the user to read a list of statements. If the statement describes how the person usually feels, they

are asked to mark the box under the column "Like Me". If the statement does not describe how the person generally feels, a mark is placed in the box corresponding to the column "Unlike Me".

One of the weaknesses of this inventory is that, beyond statements regarding high, medium, and low self-esteem, no exact criteria are provided for the interpretation of results yielded. The manual suggests that use of this inventory should be supplemented with a behavior observational rating and the development of local norms.

Much research has been conducted on the technical aspects of the SEI. The SEI has been administered to tens of thousands of children and adults since its development. Internal consistency or reliability has been well established at several grade levels. Spatz and Johnson (1973) found adequate internal consistency (e.g., coefficients in excess of .80) when they administered the school form of the scale to over 600 students in grades 5, 9, and 12. Test-retest reliability estimates are questionable given the fact that affective states are subject to change over short periods of time. Although Coopersmith attempts to examine more enduring traits related to self-esteem, he does caution that behavioral observations should be used to supplement his results. Construct validity for the SEI is also adequate, as evidenced by the congruency between test subscales and the four bipolar dimensions obtained by Kokenes' (1974) factor analysis of SEI responses of 7,600 children in grades 4 through 8. In conclusion, the Coopersmith Self-Esteem Inventory has been labelled by Keyser and Sweetland (1974) as "well documented and widely used...well thought out and researched from the beginning by a competent developmental psychologist" (p.231). The SEI was selected by this researcher primarily for its general content, easy administration, and test-retest

reliability. Unlike other self-esteem inventories, the questions on the SEI focus on self-perceptions with some reference to family support rather than work-related topics. Selection of this inventory to measure self-esteem seemed appropriate given the assumption that many full-time first-year students, especially those with special needs, may not be employed during the fall and winter semesters.

The State-Trait Anxiety Inventory Form Y (STAI) (Spielberger , C.D., Gorsuch, R.L., Lushene, R., Vagg, P.R., and Jacobs, G.A., 1983). The STAI consists of two self-report scales measuring state (current) anxiety and trait (general) anxiety. College students typically require about six minutes to complete either scale and approximately ten minutes to complete both. Each scale consists of 20 items that describe the absence or presence of anxiety. All test items are rated on a four-point scale, labelled "Not At All", "Somewhat", "Moderately So", and "Very Much So". According to Spielberger (1983), anxiety states are characterized by "subjective feelings of tension, apprehension, nervousness, and worry, and by activation or arousal of the autonomic nervous system" (p.1). The STAI State (S-Anxiety) scale is composed of 20 statements describing how respondents feel "right now". State anxiety refers to the level of anxiety experienced at a given time in a specific situation. It is the transitory feelings of fear and worry which most indivduals experience from time to time. The STAI Trait (T-Anxiety) scale is composed of 20 statements that evaluate how respondents "generally" feel. Trait anxiety refers to relatively stable individual differences in the tendency to perceive stressful situations as dangerous or threatening. Consequently, trait anxiety may be viewed as an individual's disposition or proneness to exhibit state anxiety while state anxiety may be conceived of as situation-dependent anxiety.

The STAI has been used extensively in both research and clinical settings with adults, high school students, military personnel, and college students. Normative data from Form Y are available for working adults, military recruits, college and high school students (Spielberger et al., 1983). For the purposes of this study, norms for college students were utilized. Test-retest correlations for the T-Anxiety scale conducted by Spielberger and colleagues (1983) range from 0.90 for male college students to 0.91 for females college students. Due to the transitory nature of anxiety states, the authors suggest that a more meaningful index of reliability for S-Anxiety is the alpha coefficient, a measure of internal consistency. Alpha coefficients for the Form Y S-Anxiety scales range from 0.91 for male college students to 0.93 for female college students (Spielberger et al., 1983). The test-retest correlations for the S-Anxiety scale were relatively low for college students, ranging from 0.16 to 0.62. The authors explain that low stability coefficients were expected for the S-Anxiety scale since it was designed to reflect the influence of situational factors existing at the time of testing. The internal consistency of the Trait-Anxiety scale, as indexed by coefficient alpha, ranges from 0.90 for male college students and 0.91 for female college students.

Construct, concurrent, convergent, and divergent validity is high for some measures on the STAI. Validity criteria were met at each stage of the test development process for individual STAI items. In the manual, concurrent validity for the T-Anxiety scale was measured against the IPAT Anxiety Scale (Cattell & Scheier, 1963), the Taylor Manifest Anxiety Scale (TMAS, 1953), and the Zuckerman Affect Adjective Checklist (AACL, 1960). Correlations between the T-Anxiety scale, the IPAT, and the TMAS were relatively high, ranging from 0.85 to 0.73. In contrast, the AACL, General

Form, correlated only moderately with the other measures. Convergent and divergent validity of the STAI were evidenced by larger correlations with measures of emotional disturbance and psychopathology, and smaller correlations with unrelated constructs. Correlations between the STAI and the Minnesota Multiphasic Personality Inventory (MMPI), the Cornell Medical Index, the U.S. Army Beta intelligence test, Jackson's Personality Research Form, Edwards Personal Preference Schedule, and the Mooney Problem Checklist were conducted. Results showed that high T-Anxiety scores in college students are linked to a larger number of self-reported problems in almost every area of adjustment, suggesting that anxiety-prone students develop problems in many areas (Spielberger et al, 1983). In a test critique conducted by William Chaplin (1984), it appears that the State Anxiety Scale has construct validity while the Trait Anxiety scale has questionable construct validity. The author attributes this to the low correlation obtained between the Trait Anxiety scale and the Multiple Affect Adjective Check List (r=0.52).

There is evidence that the STAI discriminated between normal subjects and psychiatric patients for whom anxiety is a major symptom of their illness. Evidence is also found in the STAI manual of construct validity through identification of nonpsychiatric patients with emotional problems using the T-anxiety scores. Construct validity is also shown through data showing that S-Anxiety scores of college students were significantly higher under examination conditions, and significantly lower after relaxation training, compared to regular class periods. According to Weinberger and colleagues (1983), correlations between the S-Anxiety and T-Anxiety scales are typically high under conditions that pose a threat to the respondents' self-esteem or

when personal adequacy is perceived to be evaluated. Correlations are lower in situations characterized by physical danger.

Learning and Study Strategies Inventory (LASSI) (Weinstein, 1987). The LASSI is a diagnostic instrument designed to "assess a set of competencies (strategies and skills) students need to manage and monitor their own learning in a variety of contexts" (Tinsley, 1994). Weinstein and MacDonald (1986) defined effective learning strategies as any affective, behavioral, or cognitive activity that assists in the encoding, storage, retrieval, and use of knowledge. Weinstein (1987) suggests that use of the LASSI by helping professionals such as secondary and post-secondary school educators, guidance counselors, and counseling psychologists provides information about a student's study pattern, which can be used for remediation. The LASSI can be used to document change in the learner and to determine the success of an intervention designed to improve learning abilities. Other uses include increasing a student's self-awareness of his/her learning style and providing specific diagnostic information from which specific interventions can be designed.

The LASSI consists of a 77-item college form and provides scores on 10 scales related to school achievement. The test measures five personal factors (e.g., Attitude, Motivation, Time Management, Anxiety, and Concentration) and five metacognitive factors (e.g., Information Processing, Selecting Main Ideas, Study Aids, Self-Testing, and Test Strategies). Attitude, the first scale, addresses a student's attitude and interest in college. The next scale, Motivation, contains items examining a student's diligence, self-discipline, and willingness to work hard. The Time Management Scale looks at the use of time management techniques for academic tasks. Items on the

Anxiety scale address the degree of worry about school and personal performance. The Concentration scale examines the student's ability to pay close attention to academic tasks. Items on the Information Processing scale concentrated on the student's use of imaginal and verbal elaboration, reasoning, and comprehension monitoring. The scale for Selecting Main Ideas examines students' ability to pick out important information for further examination or study. Items on the Study Aids scale relate to the degree of use of support techniques or material to aid learning and memory of new information. Self-Testing scale items focus on the use of comprehension monitoring strategies to review and prepare for classes and tests. Finally, the last scale, Test Strategies, concentrates on a student's approach to preparing for and taking examinations (e.g., integration of material from different sources).

All of the LASSI scales contain eight items except the five-item scale on Selecting Main Ideas. This self-report inventory can be administered individually or in a group, generally in 25-30 minutes, including 10 minutes for students to hand score their responses. According to Weinstein (1987), students who score below the 50th percentile are considered to be in need of remediation in order to succeed academically. Students scoring between the 50th and 75th percentile are asked to consider interventions to improve their learning and study skills, thereby increasing academic success. Finally, students scoring above the 75th percentile are considered to have adequate learning and study skills.

According to a test critique by Tinsley (1994), the LASSI manual does not provide adequate information on the reliability of this test. Coefficient alpha internal consistency reliabilities range from 0.68 for the scale on Study Aids to 0.86 for the Time

Management Scale. With the exception of the Study Aids scale, all scales have an internal consistency reliability of 0.72 or higher, with a median reliability of 0.81. Test-retest reliability was determined based on a sample of 209 students from an introductory communications course at a large Southwestern university (Weinstein, 1987). After a 3-week interval, test-retest reliability scores ranged from 0.72 for the Information Processing scale to 0.85 for the Concentration and Time Management scales. Median test-retest reliability was calculated at 0.975.

The LASSI manual provides no evidence of validity and does not indicate the sample from which reliability data was obtained. Testimonials from trial use of the LASSI by an undefined number of professors, advisors, developmental educators, counsellors, and learning center specialists are given to establish validity. However, these opinions provide no evidence to statistically substantiate external validity. In conclusion, it would seem that while items on the LASSI appear to have face validity, the information provided in the manual is insufficient to establish the test's reliability and construct validity.

Procedure

Participants for this study were solicited from the Disability Resource Centre at the University of Calgary. Once appropriate subjects were selected by administrators of the Disability Resource Centre, potential participants were contacted by phone or in person and invited to participate in this study. Participants were interviewed at a mutually convenient time in an office assigned to the researcher for use at the Disability Resource Centre. Once consent to participate in this study was obtained, participants

were asked to sign a request for release of information about their disability and accommodations to this researcher from the Disability Resource Centre. Permission to access each participant's high school and first year marks was also obtained. Participants were then interviewed during the first school semester for approximately 10 minutes to obtain information related to use of services from the Disability Resource Centre, a description of their learning disability, and their current academic situation (See Appendix A and B). They were then asked to complete the Coopersmith Self-Esteem Inventories (SEI), the Learning and Study Strategies Inventory (LASSI), and the State-Trait Anxiety Inventory (STAI). Completion of all three inventories took approximately 40 minutes. All students involved in this study were invited to attend a one-hour focus group to discuss their transition needs and adjustment to the university setting.

CHAPTER IV

RESULTS

Of the 44 students who agreed to participate in the study, only 38% (17 students) attended their scheduled appointments. A total of 58 appointments were made but 71% of students did not show up for their scheduled appointments. Seventeen students completed the questionnaires and interview portion of the study but complete data was obtained for only 14 students. One student was eliminated from the study as she refused to answer enough test items to conduct an analysis. Of the remaining two students, only portions of the information collected were used for analysis due to incomplete questionnaires. When possible, all other participant data (N=16) was analyzed.

Comparisons of high school grades and university grades were analyzed with several variables. The independent variables for this study included anxiety, learning strategies, gender, attendance at the University of Calgary orientation program (U of C 101), participation in extracurricular activities, use of accommodations, medical treatment, diagnosis, and self-esteem. The dependent variable of University GPA was broken down into first semester GPA, second semester GPA, and the combined or first-year GPA (Table 1). University GPA, which is provided on a 4.0 scale, was converted to a percentage to allow for commensurate measures.

Due to the limited number of participants, a regression analysis could not be performed. A variety of other parametric statistical techniques were applied to the collection of data to determine if moderating factors influenced university performance.

For exploratory purposes, Pearson-product moment correlations were computed for all variables (Tables 8 to 14).

High School Grades and University Grades

Descriptive statistics on high school grades (Tables 2A and 2B) revealed that the average marks for Math 30 for the participants in this study were in the high seventies (M=77.13, SD=11.59) and in the mid seventies for English 30 (M=74.88, SD=9.19). In contrast, the mean university GPA for the first semester was 62.51 (SD=16.10). Although there appears to be a twelve to fourteen percent difference between high school marks and university GPA, it is difficult to ascertain if this pattern is also typical of students without special learning needs due to the design on this study. During the interview portion of this study, most students (N=14) noted their surprise over the lower marks they received on tests and assignments in university compared to high school.

Correlational data was obtained to examine the relationship between high school grades and university GPA. High school grades were broken down per subject into Math 30, English 30, Social 30, Chemistry 30, and Biology 30. University GPA was examined for the first and second semester, as well as, the combined first year GPA. No significant correlations were obtained between high school and university grades (Table 8).

Self-Esteem

Participants were divided into three groups based on the results on the SEI. Those with SEI percentiles of 75 to 100% were labeled as experiencing high self-esteem, while those with percentiles of 25% or less were considered to have low self-

esteem. Students with percentiles between 25 and 75% were categorized as having medium self-esteem. This division led to the categorization for the first semester of 3 participants with low self-esteem, eleven with medium self-esteem, and two with high self-esteem. After the first semester, data from one student with low self-esteem, three with medium self-esteem, and one with high self-esteem was unavailable as they had not yet completed their second semester. Analyses of variances could not be conducted to obtain meaningful results with such a small sample size.

Correlational analyses (Table 9) revealed that self-esteem was positively correlated with the anxiety measure on the LASSI ($r=0.606$, $p=0013$), the ability to select main ideas and recognize important information ($r=0.761$, $p=0.001$), and the use of self-testing/reviewing techniques ($r=0.761$, $p=0.001$). Higher levels of self-esteem also appeared to be associated with lower levels of trait anxiety ($r=-0.630$, $p=0.009$). No significant correlation was found between self-esteem and university GPA.

State and Trait Anxiety

Participants were divided into three groups based on the results on the STAI. Those with STAI percentiles of 75 to 100% were labeled as experiencing high anxiety, while those with percentiles of 25% or less were considered to have low anxiety. Students with percentiles between 25 and 75% were categorized as having medium anxiety levels. This division resulted in the categorization for the first semester of 8 participants with low state anxiety, five with medium state anxiety, and three with high state anxiety. Among the students for which second semester university marks were available, four had low state anxiety scores and four had medium state anxiety scores.

Examination of trait anxiety scores revealed that four students scored low on this measure, seven students had medium levels of trait anxiety and five students had high trait anxiety. Due to the small sample size, analyses of variance could not be conducted on both state (current) and trait (general) anxiety scores.

A correlational analysis revealed several significant results (Tables 9 and 10). State anxiety was significantly correlated with trait anxiety ($r=0.757$, $p=0.001$) and the use of test strategies ($r=0.761$, $p=0.001$). Of interest was the negative correlation found between state anxiety as measured by the STAI and the anxiety measure on the LASSI ($r=-0.707$, $p=0.002$). Similarly, trait anxiety was also negatively correlated with the LASSI anxiety scale ($r=-0.804$, $p=0.000$).

Correlational data using trait anxiety scores also revealed many significant findings. In this study, trait anxiety was negatively correlated with attitude or interest in university ($r=-0.630$, $p=0.009$), the ability to select main ideas or recognize important information ($r=-0.720$, $p=0.002$), and the use of test strategies or reviewing to prepare for classes ($r=-0.625$, $p=0.010$). These results suggest that higher levels of general anxiety may prevent or impede the use of learning and study strategies for university courses. Similar to the results for state anxiety, a significant correlation between university GPA and trait anxiety was not obtained.

Learning Strategies and University GPA

Using the normal distribution, participants were divided into three groups as a result of their scores on each section of the LASSI. Participants who scored above the 75th percentile were considered to make "good" use of the named learning/study

strategy. Those with scores below the 50th percentile, were labeled as "poor" in that strategy with a need to improve their skills in that area to increase their chances of succeeding in the post-secondary setting. Individuals who scored between the 50th and 75th percentile were placed in the "average" category and it was suggested that they should consider improving the relevant learning and study strategy to optimize their academic performance. In this study, the majority of participants were categorized as "poor" in their use of time management skills, motivation to succeed, anxiety about school performance, concentration/attention to academic tasks, information processing, selecting main ideas, use of support techniques, self-testing, and use of test strategies (Table 3). The range of percentile scores for each section of the LASSI is listed in Table 5.

ANOVAs were performed to determine if any group differences existed from among the ten strategies scores on the LASSI and the dependent variables of first semester, second semester, and first year university GPA (Tables 6,7, and 8). Significant results were obtained for only three LASSI scores: (1) motivation (e.g., diligence, self-discipline, willingness to work hard); (2) use of time management skills; and (3) use of support techniques and materials. The range of percentile scores for all of the learning strategies are listed in Table 9. Throughout the first year of university, motivation had a strong influence on academic performance in the post-secondary setting. This is supported in the data with those scoring high in the section measuring motivation also having the highest GPA in the first and second semester of university. A similar effect can be seen in the use of time management skills. Those who reported good use of time management principles for academic tasks performed better in their

first year of university. Interestingly, individuals with an average score on the use of support techniques and materials performed better in the second semester of university and had higher grades after the first year compared to those who scored high or low on this measure. It is important to note that these results must be interpreted with caution due to the small sample size.

Several correlational analyses were conducted to examine the relationship between LASSI scales and university GPA (Tables 12, 13, and 14). The motivation/diligence scale on the LASSI was significantly correlated with first semester GPA ($r=0.597$, $p=0.015$), second semester GPA ($r=0.791$, $p=0.004$), and first year GPA ($r=0.748$, $p=0.008$). Similarly, the use of time management techniques was positively correlated with first semester GPA ($r=0.801$, $p=0.000$), second semester GPA ($r=0.741$, $p=0.009$) and first year GPA ($r=0.800$, $p=0.003$). The LASSI scale for concentration/attention to academic tasks was significantly correlated with second semester GPA ($r=0.658$, $p=0.028$) and combined first year GPA ($r=0.654$, $p=0.029$), but not with first semester GPA ($r=0.429$, $p=0.097$). The opposite trend was seen for the use of self-testing strategies where significant correlations were found with first semester GPA ($r=0.588$, $p=0.017$) and first year GPA ($r=0.654$, $p=0.029$), but not for second semester GPA ($r=0.599$, $p=0.051$). In conclusion, it appears that university GPA is affected by the use of time management techniques and self-testing strategies, as well as, the level of motivation and ability to concentrate on academic tasks.

Other Variables and University GPA

Extracurricular activities were labelled as any activity that the students engaged in outside of school hours. For example, extracurricular activities may have included participation in sports or other forms of exercise, volunteering, employment during school, club-related activities, and contact with friends. Participants were divided into two categories based on the number of different types of extracurricular activities that they were involved in (e.g., more than two activities, less than two activities). With this division, we found 11 participants who engaged in two or less activities and 4 who participated in more than two activities. A correlational analysis revealed no significant relationship between participation in extracurricular activities and university GPA.

Other moderating factors examined included gender effects, type of psychological diagnosis, use of medication for the treatment of AD/HD, and participation in U of C 101 (campus orientation). Unfortunately, due to the small sample size, statistical analyses of this data could not be calculated.

Focus Group

Due to the limited participation in the focus group, no conclusions or trends could be ascertained. With only three students participating in the focus group, it was difficult to pull out any themes in their narratives. During the meeting, it became apparent that all participants had significant differences in their living arrangements, support network, and motivation to succeed in university. Participant 1 lived in Residence, was best friends with Participant 2, and felt that she had the support of her family and friends. She claimed to be lacking self-discipline, was easily distracted, and motivated by only

parental approval to succeed academically. Participant 2 also lived in Residence and enjoyed the support of her friends. She did not feel that she had the support of her parents and reported being self-motivated to succeed. Participant 3 was thirteen years older than the other participants, lived with her partner in what she described as a "communal living" arrangement, and was self-motivated to succeed.

During the focus group, several differences in the level of support from faculty members were described by the participants. Participant 1 and 2 agreed that their professors were supportive and had no problems obtaining accommodations from faculty (e.g., "My teachers bend over backwards to accommodate me.", "These teachers will do what they can so I'll do well."). Participant 3 appeared to have negative experiences obtaining accommodations (e.g., "...I haven't been taken seriously when I request accommodations because I'm advanced verbally.").

Unlike faculty support, there were several agreements on what was helpful in the transition to the university setting. All participants agreed that the orientation program to the university (U of C 101) was not helpful in their transition to the large university campus. However, they did unanimously agree that the Disability Resource Centre was very helpful, making comments about the "encouraging receptionist" and the understanding and support that they received from the DRC staff. Participant 3 commented, "I had a very discriminating experience at the University. I had a place to vent, they helped me write a report. It was helpful to have key people that understood the emotional component and to have someone committed to helping me problem-solve."

When participants were asked to describe any difficulties they encountered completing course requirements during their first semester, participant 1 and 2 agreed on several issues. They both agreed that the amount of reading was challenging and that time management or "organizing" presented some difficulties. Participant 2 stated that she had "problems understanding what to do" and Participant 1 said that she had to change her priorities from friends, basketball, and horses to school work.

The final question on measures to be taken to ease the transition from high school to university included several suggestions. All participants agreed that "you definitely need a computer!" Participants 1 and 2 believed that understanding friends and early registration of courses were beneficial. According to Participant 1, "it's helpful if you get to register early. Then you can choose your classes. I prefer afternoon classes 'cause I'm more wide awake. And then you don't get too many heavy reading classes at the same time."

Unfortunately, due to the poor turnout for the focus group, no themes could be formulated. It was apparent, however, that the transition to the university is a unique experience and that each student had different perceptions on factors related to their transition.

Summary

Several key findings were obtained in this study. First, it was interesting to note that no significant relationship was found between high school grades and university GPA. Second, socio-emotional factors such as self-esteem and anxiety did not appear to be related to university GPA. Participants in this study scored higher on these

measures when compared to findings in the literature. Third, it appears that students who are motivated to succeed academically, have good time management skills, and average use of support techniques and materials, also have a higher GPA than their counterparts. Correlational analyses revealed that university GPA was positively related to personality traits such as motivation to succeed and the ability to concentrate on academic tasks; as well as, academic strategies such as the use of time management techniques and self-testing. Finally, there was no significant correlation between participation in extracurricular activities and university GPA for the participants in this study.

CHAPTER V

DISCUSSION

There appears to be reason to be concerned about the adjustment of students with LD and AD/HD to post-secondary institutions. With a failure rate between 66 to 92% (Rogan & Hartman, 1990; Vogel & Reder, 1999), it is evident that successful completion of a post-secondary education program is problematic for the student diagnosed with LD and/or AD/HD. This study found no significant relationship between high school grades and academic performance in university. Several key factors were found to be related to the transition of this population of students. Motivation of succeed academically, good time management skills, and average use of academic accommodations were linked to higher university GPA while self-esteem, general and current anxiety, and participation in extracurricular activities were not.

In the literature, valid predictors of college grade point average and graduation included a strong high school grade-point average, good academic preparation, a high level of motivation, the ability to maintain effort over time, strong mentoring relationships, self-knowledge and understanding of their LD, and the development and use of academic strategies (Reis & Neu, 1994; Shaywitz & Shaw, 1988; Vogel & Adelman, 1990, 1992, 1993; Vogel, Hruby & Adelman, 1993; Werner, 1993). In discussing the transition to college or university, the stress experienced by such a life event is compounded with the numerous academic adjustments that are necessary for the student with a learning disability. Levine and Nourse (1998) noted that the provision

of physical and emotional support contributed greatly to the success of students with learning disabilities in their study. For maximum benefit, the determination of factors related to successful academic adjustment to university is needed to ensure the success of transitional programs for this population. Results from this study suggest that improvements in specific learning and study strategies and increases in student motivation to succeed academically may be beneficial.

There are many limitations to this study. It is important to note that the data obtained in this study is descriptive rather than causal. It is difficult to make inferences of cause and effect since no experiment was run. Data screening was also a severe limitation. Due to the small sample size, outliers were incorporated into our data pool. This may have compromised our test results. There is also a question of whether the sample tested was representative of the LD population of the university in light of the poor participation rate. Given the failure rate of LD students that was cited in the literature review, it is notable that all subjects in this study obtained passing marks in all of their classes. The most parsimonious interpretation of these results appears to be that undergraduate students who have registered with the Disability Resource Centre, and who agreed to participate in a research study, are likely to be more academically successful than their peers with similar learning difficulties. This may be, in part, a function of their self-awareness, self-determination, and good time management skills. Nevertheless, this study found that students with more motivation to succeed at university had a higher university GPA.

All of the tests performed are difficult to interpret based on the small sample size and the uneven number of participants per cell. However, for some of the tests,

significance was found in the predicted direction, suggesting that the effects were very powerful. It would have been preferable to analyze this data through a multiple regression technique but, due to the small sample size, we were unable to do so. The small sample size is still problematic for the tests that were performed so the results must be interpreted with caution. With small sample sizes, high variability can decrease the power of tests and the validity of the means is less reliable. It was decided by this researcher to emphasize a more liberal interpretation of the results. This allowed for an examination of many possible effects with the option of further research using a larger sample size to confirm the results found in this study. Due to the exploratory nature of the study, no conclusions can be made from this data.

In terms of the anticipated relationship between high school marks and university grades, results from this study did not confirm previous research (Wilczenski & Gillepsie-Silver, 1992; Vogel & Adelman, 1990). However, comments from the interview portion of the study appear to support the contention in the literature that students with LD and AD/HD respond poorly to the demands of the student-focused post-secondary setting versus the teacher-focused high school setting. Participants in this study noted great difficulties adjusting to a change from small, intimate classroom settings to larger class sizes that often exceeded 200 students. They also noted a decrease in their marks on tests and assignments at the university level compared to marks achieved in high school. Whether this is a result of the larger class sizes in the university setting, the heavy focus on independence in completing the large amounts of reading and written assignments, the structure of course examinations, or the lack of instructor support is unknown. It is speculated by this writer that there appears to be a "shock

effect" in the transition between these two settings, despite orientation to the campus and awareness of the increased academic demands of the post-secondary setting. Current research has yet to identify the specific institutional elements that lead to the deterioration of grade-point average reported in the literature for students with special needs. It is interesting to note that, in this study, high math and English high school marks did not relate to university GPA.

Research on the anxiety levels of students with LD in the literature show that students with LD and AD/HD experience a high level of stress. Contrary to research in the literature, this study found that 50% of the students tested had low state anxiety. However, the majority of the participants (7 out of 16) were assessed with medium levels of trait anxiety. It is speculated that several mediating factors may be at play to reduce the level of stress experienced by the participants in this study. Research by Synatschk (1995) indicates that peers and family members help students with LD in controlling feelings of anxiety, suggesting that social support helps to mediate the level of anxiety. It is also speculated that the date of testing may have influenced the student's perception of anxiety-related symptoms. For example, students who were tested early in the semester or who were not preparing for exams or completing assignments may have reported lower anxiety scores.

It is interesting to note that, in this study, a negative correlation was found between the anxiety scores on the STAI and those on the LASSI. On the LASSI, the anxiety subscale measured how tense or anxious students become when approaching academic tasks whereas measures of anxiety on the STAI were not limited to academic

situations. This suggests that the two questionnaires are measuring anxiety related to different sources or that one of the questionnaires lacks validity.

Despite correlational support for self-esteem and adjustment to the post-secondary environment in the literature (Saracoglu, Minden & Wilchesky, 1989), self-esteem was not related to GPA during the initial transition to the university setting. This was demonstrated by the lack of a significant correlation between self-esteem and GPA in this study.

The literature on transition for this population of students often focuses on feelings of self-efficacy rather than self-esteem. The distinction between these two feelings appears to be an emphasis on resilience. While self-esteem is conceptualized as subjective feelings of being capable, significant, successful, and worthy (Coopersmith, 1987), self-efficacy includes an awareness of weaknesses, realistic expectations, confidence in their personal abilities, and the temerity to access resources needed to accomplish a goal (Brozo and Curtis, 1987). For students with high self-efficacy, failure is perceived as instrumental for future success. Gerber et al. (1992) found that successful adults with LD demonstrated a high level of awareness of the impact of their learning disabilities through the acknowledgement of the negative aspects of their diagnosis. Gerber, Reiff, and Ginsberg (1994, 1996) use the term "reframing" to describe this phenomena. Reframing is defined as the reinterpretation of a situation in a productive, positive way. According to these researchers, reframing occurs in stages for students with LD. The process begins with the recognition of the disability and progresses to acceptance, understanding of its implications, and taking action. Conceptually, success is dependent on a continuous process involving the

confrontation of one's weaknesses and strengths and then making the necessary adjustments. A logical conclusion would be that both self-esteem and self-efficacy provides a buffer from the environmental stressors in the university experience. Consequently, the interplay of feelings of self-efficacy, self-esteem, and university GPA would be an area for future exploration. In this study, the analysis of the impact of self-esteem was limited by the low participation rate. However, given the emphasis on the negative effect of low self-esteem on academic performance that is reported in the literature, it is essential that more research into this area of transition should be conducted.

Research into the use of learning and study strategies is relatively new but immensely informative. In Happ, Spruil and Webster's research (2002), college students with LD demonstrated a higher need for achievement and had significantly higher resiliency scores on the Hall Resiliency Scale than their college peers. Even with such a small sample size, this study yielded conclusive results for the support of several strategies to enhance academic performance among this population of students. As expected, students with high levels of motivation and good use of time management skills performed better in the university setting. This finding was consistent with Synatschk's (1995) research describing persistence and perseverance as essential factors to achieving success in the university environment. Although the literature emphasizes the usefulness of support techniques and services for students with LD and AD/HD, it was interesting to note that only the moderate use of accommodations was linked to a higher GPA. In this study, all students, with one exception, used academic accommodations at the university level. It appears that academic success may require

a student to moderate the use of such techniques or services to avoid a lack of excessive reliance on external support. It is speculated that this result may be due to time-related variables. Since the use of academic accommodations requires a certain amount of time to execute, students must achieve a balance between the time needed to implement their choice of accommodation and the most efficient use of their time.

The successful use of accommodations and other support services often depends on a co-operative relationship between student and teacher. It is unfortunate that professors are often unwilling or lack the ability to recognize and help students with learning difficulties (Stage & Milne, 1996). In addition, some professors are unwilling or unsure how to accommodate students with LD by modifying curriculum and educational methods. There may be some concern about how to alter course materials and assignments while maintaining consistent standards of evaluation. According to Shaw et al. (1989), students with learning disabilities are often unskilled in evaluating courses, planning long-range study time, and asking for help or accommodations from faculty unless specifically instructed. When faculty attitudes and practices towards providing teaching and examination accommodations for students with learning disabilities are explored, it is evident that this is also a barrier to academic success for this population. In Vogel, Leyser, Wyland, & Brule's (1999) study, faculty were least willing to provide supplementary materials such as an outline of their lecture, to provide assignments in an alternative format, and to alter the format of examinations. Since faculty co-operation is essential for implementing some accommodations such as extended exam time, changes to exam or assignment format, etc., faculty attitudes are relevant to a

student's willingness to use these accommodations to facilitate their academic performance.

The correlational analyses conducted in this study confirmed that many of the variables under question were correlated to academic performance. This also gives credence to the study design and need for further research along the same lines. The fact that university GPA was found to be positively related to motivation, concentration on academic tasks, use of time management skills and the use of self-testing was consistent with the other findings of this study. It seems plausible to conclude that increasing a student's use of learning and study strategies will increase academic performance at the university level.

It was unfortunate that, due to the poor turnout, no conclusions could be ascertained based on information provided from the focus group. The resulting lack of attendance was surprising given that this researcher attempted to change the date of the group meeting to accommodate all potential participants and provided reminder calls the night before. However, the fact that 1 out of 5 students (20%) attended the meeting was consistent with the poor participation rate for the questionnaire and interview portion of the study. When students who had missed an appointment were contacted to rebook, the majority stated that they had forgotten about the meeting. It is speculated by this researcher that poor time management skills coupled with the excessive demands on a student's time to study and complete course assignments may have contributed to the poor participation rate.

Implications for Future Research

One of the main implications of this research is that it supports a counselling model rather than emphasizing basic skills remediation or academic tutoring. A counselling model can provide a consistent support system, build self-confidence, and reduce client anxiety levels. Services that could be offered include academic advisement, assessment, increasing information processing skills, personal counselling, and consistent monitoring of academic progress. In the psychosocial area, strengthening of self-esteem through awareness, assessment, accommodations, and advocacy is paramount. In a positive sense, the students with LD seemed to have a greater academic self-awareness than most of their peers (Stage & Milne, 1996). Those students who were interviewed in this study knew exactly what their strengths and weaknesses were and were able to capitalize on the former or compensate for the latter as the situation demanded.

The results of this study also support the development of a comprehensive student-directed transition plan. This plan would not only incorporate the selection and application to appropriate universities with accommodations, counselling, and disability services, but also an emphasis on developing self-determination and self-awareness in the student with LD and AD/HD. Students should also be encouraged to show initiative in improving their organization, self-advocacy, and study skills. They will need to develop an awareness of the impact of anxiety, self-esteem, and their current level of study and learning skills on their transition from the high school setting to a large university campus. One of the most significant findings in this study was that the factors linked to academic success (e.g., motivation, time management skills, use of academic

accommodations) are learned skills rather than genetic qualities. Students can learn to structure their schedules to allocate sufficient time to prepare for lectures, study, and complete assignments. They can also avoid unnecessary demands on their time (e.g., working for extra spending money, volunteering during the school semester). It is apparent that high school students with learning disabilities must be taught the skills necessary to plan and direct their own educational programs and ultimate transition to university life.

Although the results from this study indicate that obtaining participants is problematic, it is essential that researchers continue their efforts to ascertain factors impeding academic success at the university level for this population of students. Suggestions to increase the participation rate include a collaborative effort between the Disability Resource Centres of post-secondary institutions and researchers. For example, when a new student first accesses disability-related services, they could be encouraged to complete a variety of questionnaires similar to the ones used in this study. Information obtained from these questionnaires and interviews between staff members and students could be shared between the service provider and transition researchers. This would facilitate not only data collection at university entry but assist in obtaining longitudinal data as well.

Another area for future research is the exploration of psychosocial factors, use of academic accommodations, social support networks, and the use of learning and study strategies. The observed discrepancy between the anticipated and actual results of this study suggests a need to increase research in these areas. Due to the small sample size, the analysis of the impact of self-esteem and anxiety on university G.P.A. was

limited. Based on the literature, it would seem prudent to examine the emotional readiness, as well as, academic preparedness of students upon entry to university. However, transition-related services often do not focus on the emotional component of university adjustment. With an increase in research into psychosocial factors, necessary changes to individualized transition plans can be formulated.

Summary

In this exploratory study, many of the results obtained did not fall in the predicted direction. Contrary to previous research findings, high school G.P.A. did not appear to be related to university G.P.A.. The majority of students in this study did not report the high levels of anxiety and low self-esteem that were reported in the literature among this population of students. However, results from the analysis of the use of study and learning strategies did appear to support findings in the literature. Significant results were observed for motivation to succeed academically, use of time management skills, the moderate use of support techniques, and participation in extracurricular activities. It is unfortunate that the low participation rate compromised the analysis of test results. However, significance in the predicted direction was found for some factors, suggesting that a powerful effect would have been observed with a larger sample size. Future research involving a focus on psychosocial factors in addition to academic skills is suggested to increase the success of students with LD and/or AD/HD in the completion of their university program.

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Appendix A

Please take the time to answer the following questions. All information provided in this questionnaire will be kept confidential by the researcher and her supervisor.

Date of Birth:	**Year of Program:**
Program/Faculty:	
What courses are you currently registered in? What are your expected grades for each course?	
Describe the class size for each of your courses.	
Have you been diagnosed with any disability/disorder? If yes, please explain.	
Are you currently taking any medication? If yes, please describe.	
Are you currently receiving any counselling services or other treatment? If so, where?	
Have you participated in any programs to prepare you for university (e.g., high school transition workshops, U of C 101, etc.). If yes, please describe.	
Have you attended any post-secondary institution other than the University of Calgary? Where and for how long? What were your reasons for leaving?	

Appendix B

Interview Questions

Describe your learning disability or attention difficulties.

Describe any support services you received before coming to the University of Calgary.

Describe any factors (e.g., work, family, volunteer work, clubs, etc.) that may be affecting (positively or negatively) your transition to the university.

Have you accessed any of the following services from the Disability Resource Centre and how often?

- Advisement contact(s)
- Test accommodation(s)
- Adaptive technology
- Assistive services (e.g., note-takers, scribes, tutors)

How are you doing so far?

How do you expect to do this semester?

Appendix C

Focus Group Format

Opening	1. Tell us your name, what program you are registered in, and what you most enjoy about being at the University of Calgary.
Introduction	2. What was your first impression of the University of Calgary?
Transition	3. Tell us about your experiences adjusting to the university setting.
Key	4. What was helpful in your transition to university (e.g., advice or services provided by the Learning Disability Resource Centre, introductory programs such as U of C 101, etc.).
Key	5. Describe any difficulties you encountered completing course requirements during your first semester.
Ending	6. Describe what measures could be taken to make the transition to university easier.

Table 1

Mean University GPA for First Semester, Second Semester, and First Year

	First Semester GPA	Second Semester GPA	First Year GPA
N	15	11	11
M	62.51	69.94	67.39
SD	16.10	13.87	15.33

Table 2A

Mean Grades of High School Courses for all Participants

	Math 30	English 30	Social 30
M	77.13	74.88	76.40
SD	11.59	9.19	10.82

Table 2B

Mean Grades of High School Courses for Participants with Second Semester University Marks

	Math 30	English 30	Social 30
M	78.73	73.91	77.45
SD	11.03	10.50	11.41

Table 3

Means and Standard Deviations For Poor, Average, and Good Use of Study/Learning Strategies

Study/Learning Strategy		First Semester GPA	Second Semester GPA	First Year GPA
Attitude				
Poor	N	6	5	5
	M	60.69	63.27	61.40
	SD	17.38	10.23	14.50
Average	N	4	3	3
	M	66.56	70.42	69.08
	SD	17.67	18.70	20.20
Good	N	6	3	3
	M	65.21	80.58	75.67
	SD	17.39	11.00	12.24
Motivation, Diligence, Self-Discipline, Willingness To Work Hard				
Poor	N	9	6	6
	M	56.60	61.51	58.79
	SD	14.51	11.88	14.34
Average	N	4	3	3
	M	64.31	75.58	72.08
	SD	13.54	7.39	6.90
Good	N	3	2	2
	M	85.00	86.75	86.13
	SD	2.18	4.60	3.71
Use of Time Management Skills				
Poor	N	10	6	6
	M	54.66	62.26	58.13
	SD	12.17	13.25	13.34
Average	N	3	3	3
	M	76.83	77.83	77.08
	SD	14.26	11.03	12.15
Good	N	3	2	2
	M	81.50	81.13	80.63
	SD	3.91	3.36	4.07

Table 3 con't

Study/Learning Strategy		First Semester GPA	Second Semester GPA	First Year GPA
Anxiety and Worry About School Performance				
Poor	N	12	9	9
	M	67.47	72.37	70.42
	SD	16.38	13.46	14.42
Average	N	1	1	1
	M	36.50	49.50	43.00
	SD	-----	-----	-----
Good	N	3	1	1
	M	58.50	68.50	64.50
	SD	7.70	-----	-----
Concentration and Attention to Academic Tasks				
Poor	N	10	8	8
	M	61.11	65.92	63.06
	SD	15.19	13.12	14.52
Average	N	4	2	2
	M	59.75	76.00	74.00
	SD	17.10	10.61	13.44
Good	N	2	1	1
	M	85.75	90.00	88.75
	SD	2.47	-----	-----
Information Processing, Acquiring Knowledge and Reasoning				
Poor	N	7	5	5
	M	61.18	66.37	64.90
	SD	12.50	10.78	11.66
Average	N	3	2	2
	M	62.88	69.88	66.63
	SD	20.20	19.27	23.86
Good	N	6	4	4
	M	67.46	74.44	70.88
	SD	20.86	17.72	19.63

Table 3 con't

Study/Learning Strategy		First Semester GPA	Second Semester GPA	First Year GPA
Selecting Main Ideas and Recognizing Important Information				
Poor	N	13	10	10
	M	66.63	70.08	67.68
	SD	16.84	14.61	16.13
Average	N	1	1	1
	M	60.50	68.50	64.50
	SD	-----	-----	-----
Good	N	2	0	0
	M	47.50	-----	-----
	SD	3.54	-----	-----
Use of Support Techniques and Materials				
Poor	N	8	6	6
	M	63.80	64.68	62.38
	SD	14.48	10.49	12.12
Average	N	6	4	4
	M	70.79	82.94	81.00
	SD	16.51	6.15	6.53
Good	N	2	1	1
	M	43.25	49.50	43.00
	SD	9.55	-----	-----
Self Testing, Reviewing, and Preparing for Classes				
Poor	N	11	8	8
	M	59.01	66.98	63.25
	SD	15.09	14.26	15.32
Average	N	3	1	1
	M	67.50	68.50	68.50
	SD	17.02	-----	-----
Good	N	2	2	2
	M	85.00	82.50	83.38
	SD	3.54	10.61	7.60

Table 3 con't

Study/Learning Strategy		First Semester GPA	Second Semester GPA	First Year GPA
Test Strategies and Preparing for Tests				
Poor	N	12	9	9
	M	64.89	67.87	65.33
	SD	16.32	13.60	15.19
Average	N	1	1	1
	M	87.50	90.00	88.75
	SD	-----	-----	-----
Good	N	3	1	1
	M	51.83	68.50	64.50
	SD	79.91	-----	-----

Table 4

Analyses of Variance of Learning and Study Strategies with First Semester GPA

Source	df	F	p
Attitude	2, 13	0.165	0.850
Motivation, Diligence, Self-Discipline, Willingness to Work Hard	2, 13	5.261	**0.021**
Use of Time Management Skills	2, 13	8.361	**0.005**
Anxiety and Worry About School Performance	2,13	2.099	0.162
Concentration and Attention to Academic Tasks	2,13	2.420	0.128
Information Processing, Acquiring Knowledge and Reasoning	2,13	0.217	0.808
Selecting Main Ideas and Recognizing Important Information	2,13	1.230	0.324
Use of Support Techniques and Materials	2,13	2.531	0.118
Self Testing, Reviewing, and Preparing for Classes	2,13	2.702	0.104
Test Strategies and Preparing for Tests	2,13	2,139	0.157

Table 5

Analyses of Variance of Learning and Study Strategies with Second Semester GPA

Source	df	F	p
Attitude	2, 8	1.657	0.250
Motivation, Diligence, Self-Discipline, Willingness to Work Hard	2,8	5.201	**0.036**
Use of Time Management Skills	2,8	2,795	0.120
Anxiety and Worry About School Performance	2,8	1.305	0.323
Concentration and Attention to Academic Tasks	2,8	1.838	0.220
Information Processing, Acquiring Knowledge and Reasoning	2,8	0.326	0.731
Selecting Main Ideas and Recognizing Important Information	1,9	0.011	0.920
Use of Support Techniques and Materials	2,8	7.598	**0.014**
Self Testing, Reviewing, and Preparing for Classes	2,8	1.010	0.406
Test Strategies and Preparing for Tests	2,8	1.198	0.351

Table 6

Analyses of Variance of Learning and Study Strategies with First Year GPA

Source	df	F	p
Attitude	2, 8	0.805	0.480
Motivation, Diligence, Self-Discipline, Willingness to Work Hard	2,8	4.260	0.055
Use of Time Management Skills	2,8	3.817	0.069
Anxiety and Worry About School Performance	2,8	1.648	0.251
Concentration and Attention to Academic Tasks	2,8	1.675	0.247
Information Processing, Acquiring Knowledge and Reasoning	2,8	0.142	0.869
Selecting Main Ideas and Recognizing Important Information	1,9	0.035	0.855
Use of Support Techniques and Materials	2,8	6.893	**0.018**
Self Testing, Reviewing, and Preparing for Classes	2,8	1.528	0.274
Test Strategies and Preparing for Tests	2,8	1.089	0.382

Table 7

Range of Percentile Test Scores on the LASSI

Source	Poor	Average	Good
Attitude	7.5-35%	50-60%	80-95%
Motivation, Diligence, Self-Discipline, Willingness to Work Hard	5-30%	50-75%	85-90%
Use of Time Management Skills	<1-30%	50-60%	85-95%
Anxiety and Worry About School Performance	<1-45%	50%	80-95%
Concentration and Attention to Academic Tasks	<1-35%	50-65%	85-90%
Information Processing, Acquiring Knowledge and Reasoning	3.6%-35%	60-75%	80->99%
Selecting Main Ideas and Recognizing Important Information	1-40%	75%	90-97.5%
Use of Support Techniques and Materials	<1-40%	55-75%	80%
Self Testing, Reviewing, and Preparing for Classes	2-35%	50-65%	85-87.5%
Test Strategies and Preparing for Tests	<1-30%	70%	80-97.5%

Table 8

Correlations Between High School Grades and University GPA

Pairings	r	sig.
GPA First Semester and Math 30	0.367	0.178
GPA First Semester and English 30	0.082	0.762
GPA First Semester and Social 30	0.117	0.678
GPA First Semester and Chemistry 30	0.430	0.163
GPA First Semester and Biology 30	0.447	0.196
GPA Second Semester and Math 30	0.417	0.203
GPA Second Semester and English 30	0.346	0.298
GPA Second Semester and Social 30	0.245	0.468
GPA Second Semester and Chemistry 30	0.441	0.235
GPA Second Semester and Biology 30	0.474	0.342
GPA First Year and Math 30	0.322	0.334
GPA First Year and English 30	0.346	0.298
GPA First Year and Social 30	0.146	0.668
GPA First Year and Chemistry 30	0.405	0.280
GPA First Year and Biology 30	0.368	0.472

Table 9

Correlations Between Self-Esteem and Other Variables

Pairings	r	sig.
Self-Esteem and University GPA		
Self-Esteem and GPA First Semester	0.008	0.978
Self-Esteem and GPA Second Semester	0.123	0.720
Self-Esteem and GPA First Year	0.312	0.380
Self-Esteem and Anxiety Measures on the STAI		
Self-Esteem and State Anxiety	-0.456	0.076
Self-Esteem and Trait Anxiety	-0.630	**0.009**
Self-Esteem and Measures on the LASSI		
Self-Esteem and Attitude/Interest	0.402	0.123
Self-Esteem and Motivation/Diligence	0.350	0.184
Self-Esteem and Time Management	0.186	0.490
Self-Esteem and Anxiety	0.606	**0.013**
Self-Esteem and Concentration/Attention	0.562	0.023
Self-Esteem and Information Processing	0.215	0.423
Self-Esteem and Selecting Main Ideas	0.754	**0.001**
Self-Esteem and Support Techniques	0.096	0.724
Self-Esteem and Self-Testing	0.452	0.079
Self-Esteem and Test Strategies	0.761	**0.001**

Table 10

Correlations Between State Anxiety and Other Variables

Pairings	r	sig.
State Anxiety and University GPA		
State Anxiety and GPA First Semester	0.008	0.978
State Anxiety and GPA Second Semester	0.240	0.477
State Anxiety and GPA First Year	0.207	0.542
State Anxiety and Trait Anxiety	0.757	**0.001**
State Anxiety and Self-Esteem	-0.456	0.076
State Anxiety and Measures on the LASSI		
State Anxiety and Attitude/Interest	-0.456	0.076
State Anxiety and Motivation/Diligence	-0.500	0.854
State Anxiety and Time Management	0.320	0.707
State Anxiety and Anxiety	-0.707	**0.002**
State Anxiety and Concentration/Attention	-0.279	0.296
State Anxiety and Information Processing	-0.098	0.719
State Anxiety and Selecting Main Ideas	-0.462	0.070
State Anxiety and Support Techniques	-0.395	0.130
State Anxiety and Self-Testing	0.452	0.079
State Anxiety and Test Strategies	0.761	**0.001**

Table 11

Correlations Between Trait Anxiety and Other Variables

Pairings	r	sig.
Trait Anxiety and University GPA		
Trait Anxiety and GPA First Semester	0.104	0.704
Trait Anxiety and GPA Second Semester	-0.045	0.481
Trait Anxiety and GPA First Year	-0.112	0.742
Trait Anxiety and State Anxiety	0.757	**0.001**
Trait Anxiety and Self-Esteem	-0.630	**0.009**
Trait Anxiety and Measures on the LASSI		
Trait Anxiety and Attitude/Interest	-0.630	**0.009**
Trait Anxiety and Motivation/Diligence	0.023	0.932
Trait Anxiety and Time Management	0.135	0.619
Trait Anxiety and Anxiety	-0.804	**0.000**
Trait Anxiety and Concentration/Attention	-0.340	0.198
Trait Anxiety and Information Processing	0.137	0.612
Trait Anxiety and Selecting Main Ideas	-0.720	**0.002**
Trait Anxiety and Support Techniques	-0.126	0.641
Trait Anxiety and Self-Testing	-0.171	0.528
Trait Anxiety and Test Strategies	-0.625	**0.010**

Table 12

Correlations Between LASSI Scales and First Semester University GPA

Pairings	r	sig.
Attitude/Interest and GPA First Semester	0.113	0.676
Motivation/Diligence and GPA First Semester	0.597	**0.015**
Time Management and GPA First Semester	0.801	**0.000**
Anxiety and GPA First Semester	-0.136	0.615
Concentration/Attention and GPA First Semester	0.429	0.097
Information Processing and GPA First Semester	0.178	0.509
Selecting Main Ideas and GPA First Semester	-0.210	0.436
Support Techniques and GPA First Semester	0.113	0.677
Self-Testing and GPA First Semester	0.588	**0.017**
Test Strategies and GPA First Semester	0.012	0.966

Table 13

Correlations Between LASSI Scales and Second Semester University GPA

Pairings	r	sig.
Attitude/Interest and GPA Second Semester	0.507	0.111
Motivation/Diligence and GPA Second Semester	0.791	**0.004**
Time Management and GPA Second Semester	0.741	**0.009**
Anxiety and GPA Second Semester	0.048	0.888
Concentration/Attention and GPA Second Semester	0.658	**0.028**
Information Processing and GPA Second Semester	0.290	0.387
Selecting Main Ideas and GPA Second Semester	0.227	0.502
Support Techniques and GPA Second Semester	0.406	0.215
Self-Testing and GPA Second Semester	0.599	0.051
Test Strategies and GPA Second Semester	0.593	0.055

Table 14

Correlations Between LASSI Scales and First Year University GPA

Pairings	r	sig.
Attitude/Interest and GPA First Year	0.396	0.228
Motivation/Diligence and GPA First Year	0.748	**0.008**
Time Management and GPA First Year	0.800	**0.003**
Anxiety and GPA First Year	0.080	0.815
Concentration/Attention and GPA First Year	0.654	**0.029**
Information Processing and GPA First Year	0.200	0.555
Selecting Main Ideas and GPA First Year	0.239	0.479
Support Techniques and GPA First Year	0.357	0.282
Self-Testing and GPA First Year	0.654	**0.029**
Test Strategies and GPA First Year	0.566	0.070