Social Cognitive Theory to Predict Exercise Behaviors for College Students with Disabilities

by

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DEDICATION

This dissertation is dedicated to my father,
Michael B. Mahr, who always believed I could do anything I put my mind to. I miss you every day.

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ABSTRACT

The purpose of this study is to examine whether constructs embedded in Bandura's social cognitive theory (SCT) predict exercise behavior for college students with disabilities. This will include a consideration of how self-efficacy, outcome expectancies, impediments (i.e., stress, alcohol abuse, and physical barriers to exercise), and facilitators (i.e., social support and climate towards disability) influence behaviors. Participants were recruited from two Midwestern Universities, the University of Wisconsin-Madison and the University of Wisconsin- Milwaukee. Participants completed a survey collecting demographic information (including, age, gender, race/ethnicity, living situation, severity of disability), impediments (i.e., stress, alcohol abuse, physical barriers to exercise, depression), facilitators (i.e., social support and climate towards disability), and SCT factors of exercise self-efficacy and exercise outcome expectancy. The outcome variable, exercise behavior, was predicted from a total score from The Physical Activity Scale for Individuals with Physical Disabilities (PASIPD). This quantitative study was analyzed using hierarchical linear regression and correlational analysis.

Chapter 1

Introduction

Health is important for overall physical, psychological, and emotional well-being for both the general population, and even more so, for individuals with disabilities. Being healthy is an essential condition for functioning optimally and integrating fully into all aspects of society, including work and recreation (Lynch & Chiu, 2009; Ravesloot, Seekins, & White, 2005). Health is related to increased longevity, lower obesity rates, improved psychological functioning, diminished levels of stress, and increased quality of life. People's health and well-being are robustly affected by preventative lifestyle factors such as smoking, hygiene, diet, and physical activity, all of which involve behaviors that are commonly assumed to be controlled by the individual. These controllable health behaviors are a primary indicator of health (Mokdad & Remington, 2010). Therefore, health behaviors take on an important focus in the effort to attain and maintain health. Health behaviors developed in young adulthood have an impact on long-term outcomes for overall health and quality of life. Research has shown that an increase in obesity or weight gain in college students raises serious health concerns (e.g., diabetes, circulatory issues, respiratory concerns) that may determine long-term secondary problems if not addressed during the college years (Greene et al., 2007).

Nearly 10% of students with disabilities who fail to graduate from college reported the cause being related to health (Newman, Wagner, Cameto, Knokey & Shaver, 2010). The US Government Accountability Office (GAO) reported that approximately 11% of students attending postsecondary institutions in 2008 identified as having a disability (Wilson, Hoffman, & McClaughin, 2009). The disability classifications identified most often by college students included emotional or psychiatric conditions (24.3%), attention deficit disorder (19.1%),

orthopedic or mobility impairment (15.1%), and other disability (15%) (GAO). The Higher Education Opportunity Act (HEOA) and Individuals with Disabilities Education Improvement Act (IDEA), both include important provisions that improve access to higher education institutions for persons with disabilities (Wilson et al., 2009). Yet, data suggests that health challenges can limit success, and, therefore, access must include considerations of health.

College students with disabilities may face environmental challenges (e.g. facilities, transportation, medical appointments) preventing them from engaging in healthy behaviors such as exercise, healthy nutritional choices, and adequate sleep. College students with or without disabilities may also face obstacles to developing positive health behaviors due to the stress of transitioning to college life as they adapt and adjust to the demands of higher education. Healthy behaviors of college students with disabilities require greater focus, as people with disabilities lead more sedentary lives and experience more obesity and associated co-morbidities than the general population (Katz, McHorney, & Atkinson, 2000; Paeratakul, Lovejoy, Ryan, & Bray, 2002; Weil et al., 2002) and may realize the most benefits from participation (Aldana, 2001; Bertera, 1993).

The mission of a national initiative, Healthy People 2020, is to improve the health status of Americans by (a) eliminating behavioral and physical health disparities, preventable diseases, disabilities, and injuries and (b) by restructuring social and physical environments to promote healthy behaviors and lifestyles that will improve overall quality of life (United States Department of Health and Human Services [USDHHS], 2020). Fortunately, research demonstrates that wellness behavior can be improved and that several secondary health conditions can be managed (Barlow, Wright, & Kroll, 2001; Crisp, 2005; Goldberg & Steury, 2001; Haugli et al., 2003; Ravesloot et al., 2007). There are numerous positive benefits to

healthy lifestyles and exercise for individuals with or without disabilities. The returns for engaging in positive health behaviors for college students with disabilities may include enhanced feelings of well-being, improved performance during work, higher academic success, and better interpersonal skills among peers.

The aim of this study, therefore, is to examine whether the variables described by the Bandura's Social Cognitive Theory, impediments (stress, alcohol abuse and physical barriers to exercise), facilitators (social support and college climate towards disability), health self-efficacy and health outcome expectancy are predictive of exercise behavior for college students with disabilities. This information may be useful for college administrators, rehabilitation counseling professionals, educational policymakers and health care practitioners when addressing the needs of individuals with disabilities to engage in exercise behaviors during the college years.

Background of the Study

Within the United States higher educational system, there are approximately 18 million students enrolled in colleges and universities, and most fall within the stage of young adulthood (ages18 to 25 years old; Snyder, Dillow & Hoffman, 2007). Despite the fact that college and university students typically engage in healthier behaviors than their same-age peers, college and university students are still susceptible for developing poor health habits (Sax, 1997). The importance of these health behaviors is underscored by their potential repercussions. Alcohol abuse, poor nutrition, and limited exercise are common college student behaviors that may lead to issues with academic achievement, interpersonal relationships, violent behavior, physical injuries, emotional difficulties, and, ultimately, death (Patrick, Grace & Lavato, 1992; Wechsler & Isaac, 1992; Guyton et al., 1989).

In 2010, approximately 56.7 million people (18.7 %) of the United States population had disabilities. This number has increased by 2.2 million since 2005 (Brault, 2012). Of this population, about 12.6% of the population are considered to be individuals with a severe disability (Adams, Martinez, Vickerie, & Kirzinger, 2011). Individuals who have a physical disability from an injury or chronic illness have a narrower margin of health (DeJong & Hughes, 1982). In comparison to the general population, people with disabilities are at greater risk of being physically inactive and typically experience a variety of secondary conditions that can reduce overall health, including obesity, skin breakdown, sleep disorders, gastrointestinal problems, osteoporosis, and chronic pain (Rimmer, Yamaki, Lowry, Wang & Vogel, 2010). Rehabilitation research examining individuals with a wide range of physical disabilities propose that this population experience an average of 14 secondary conditions per year (Seekins, Clay & Ravesloot, 1994). On the contrary, individuals who do not have secondary conditions, are more apt to participate in society in educational settings (Lynch & Chiu, 2009). Secondary conditions can decrease functional disability, prohibit the individual's ability to reach personal goals as well as increase medical expenditures.

The importance of health behaviors in college combined with the risks to health experienced by people with disabilities supports the need to address exercise behavior in college students with disabilities. Physical activity and exercise are critical health indicators and are viewed as a particular concern for vulnerable populations, such as people with disabilities (USDHHS, 2000). Exercise behavior has been recognized as an integral aspect of disease prevention, and low levels of physical activity have the potential to restrict functional independence and increase the risk of chronic disease (Washburn, Zhu, McAuley, Frogley, & Figoni, 2002). Participation in exercise and physical activity has been shown to result in positive

physical (e.g., reduced rates of obesity) and psychological (e.g., decreases in psychiatric symptoms) health outcomes (Bradshaw, Lovell, & Harris, 2005; Faulkner & Biddle, 1999; Knöchel et al., 2012; Roberts & Bailey, 2011). Therefore, by understanding what factors can predict exercise behavior among college students with disabilities, health care professionals will have a deeper understanding of how to increase health and reduce secondary conditions among people with disabilities.

One of the main concerns regarding positive general health and exercise behavior exhibited by individuals with disabilities is the lack of resources. Several health incentives and initiatives focus on the needs and goals of the general population without addressing the unique health needs of people with disabilities (Holland, Greenberg, Tidwell, & Newcomer, 2003; Kinne, Patrick, & Doyle, 2004; Lollar, 2002). Access to facilities is often problematic, including, but not limited to, transportation to health facilities, inaccessible exercise equipment, and inadequately trained personnel to assist people with disabilities (Holland et al., 2003). Research has documented that people with disabilities—those who have long-term physical, mental, intellectual, or sensory impairments that have many unmet health and rehabilitation needs, face barriers in accessing mainstream health-care services, and consequently have poor health (Coleman , Loppy & Walraven, 2002; Kirschner, Breslin & Iezzoni , 2004: Kersten , George, McLellan , Smith, & Mullee, 2000; MacLachlan &Swartz, 2009). As a result, it is apparent that addressing how to remove barriers to exercise and physical activity for college students with disabilities is a concern on both individual and societal levels.

Purpose of this Study

The primary purpose of this study is to evaluate the predictive ability of variables

described in SCT for exercise behaviors for college students with disabilities. This research question will be investigated by collecting survey data from college students with disabilities from two Mid-Western Universities. The hypothesis will be tested based on the SCT as a premise for exercise behavior. According to Bandura (2005, 2007), perceived efficacy and specific predictors related to efficacy play a key role in human functioning because they affect behavior not only directly, but by impacting other determinants such as goals and aspirations, outcome expectations, affective tendencies, and opportunities in the social environment. The SCT theory allows consideration of impediments and facilitators as motivating factors, and this study will examine which factors within SCT are the most significant in predicting exercise behaviors. It was predicted that this data will be useful in understanding if exclusive variables may impact exercise behaviors for college students with disabilities. If the specific factors of the SCT are found to be applicable for college students with disabilities, then college administrators, rehabilitation professionals and other human service professions may utilize these results to address the specific needs of college students with disabilities in order to increase exercise behaviors for this unique population.

Significance of This Study

The significance of this study stems from its potential for providing in depth consideration about the unique variables of the SCT that predict exercise behavior for college students with disabilities. This information is critical for college administrators, health care professionals and rehabilitation counseling professionals to understand if there are measures to take in order to address the unique health needs of college students with disabilities in higher educational settings. This examination of the constructs within SCT is influential and predictive of exercise behaviors and will assist in planning, developing and implementing rehabilitation

goal plans. In addition, this will provide greater direction for specific interventions and research on college campuses. Also, results from this study will provide insight, recommendations, and the relevant implications for future research by rehabilitation counseling professionals. If the results of this study identify what needs to be considered in order to decrease secondary conditions while increasing exercise behaviors for college students with disabilities, rehabilitation professionals can utilize the SCT as framework to implement effective rehabilitation plans within the college setting.

Definitions

Secondary Conditions- Secondary condition was a term introduced by Marge (1988) and was defined by the Institute of Medicine (IOM) as an additional physical or mental health condition that occur as a result of having a primary disabling condition (Pope, 1991). This term has continued to be expanded over time and a little more than a decade ago, the American national health agenda, *Healthy People 2010* (USDHHS, 2000) expanded this definition to include medical, social, emotional, mental, family, or community problems related to having a disability.

Physical Activity and Exercise- Physical activity was defined by Washburn et al. (2002) to include various typical activities such as home repair, housework, sport and recreation, and activity related to employment and transportation. Physical activity is considered the broader concept, with exercise being a planned and organized part of the concept that indicates a medium to higher level of intensity of activity. It is common for researchers to use the terms interchangeably due to measurement limitations of some instruments. The primary research focus here will be on exercise behavior as

Theoretical Orientation-Social Cognitive Theory

The SCT, which is composed of the knowledge of health risks and benefits, perceived self-efficacy, outcome expectations, goals, and perceived facilitators and obstacles will be the groundwork for this study (Bandura, 1997). Embedded in this theory, Bandura believed that people are actors as well as products of their environment. The theory proposes that if individuals demonstrate behavioral actions based on their own sense of control. In addition, human motivation and action are specifically regulated by forethought and perceived control over a situation. Bandura (1977) premised that an individuals anticipatory control over a situation will regulate motivation leading to intentional behavioral change. In addition, this concept encompasses the following constructs: (a) people learn from watching others; (b) learning is internal and does not always manifest itself in behavior; (c) behavior is goal directed; (d) individuals learn to control their behaviors; (e) there are direct and indirect effects of reinforcement and punishment (Ormrod & Davis, 2004).

The SCT is widely known as an applied theory for understanding how people acquire and retain certain behaviors (Wise, 2002). There are specific factors that influence an individuals' behavior (Bandura, 1977) according to the SCT. The first factor of perceived self-efficacy is focused on the people's beliefs in their capabilities to engage in a specific action to result in a desired outcome. Secondly, outcome expectancies are also the other core construct of SCT which is concerned with people's beliefs about the potential consequences of their action. In addition to these two fundamental components, SCT integrates goals and perceived impediments. In regards to this study, self-efficacy will be examined in the context of exercise self-efficacy capturing how college students with disabilities perceive the belief that they have the ability to perform exercise behaviors. Health outcome expectancies will be analyzed by examining college students

with disabilities perceptions if the task will effect a desired outcome (is this exercise behavior worth doing?). This study will examine if the variables of stress, alcohol abuse, and barriers to exercise as risk factors to predictng exercise behavior for students with disabilites. In addition, the facilitators of social support and positive climate towards disability will be examined to see if they predict exercise behavior.

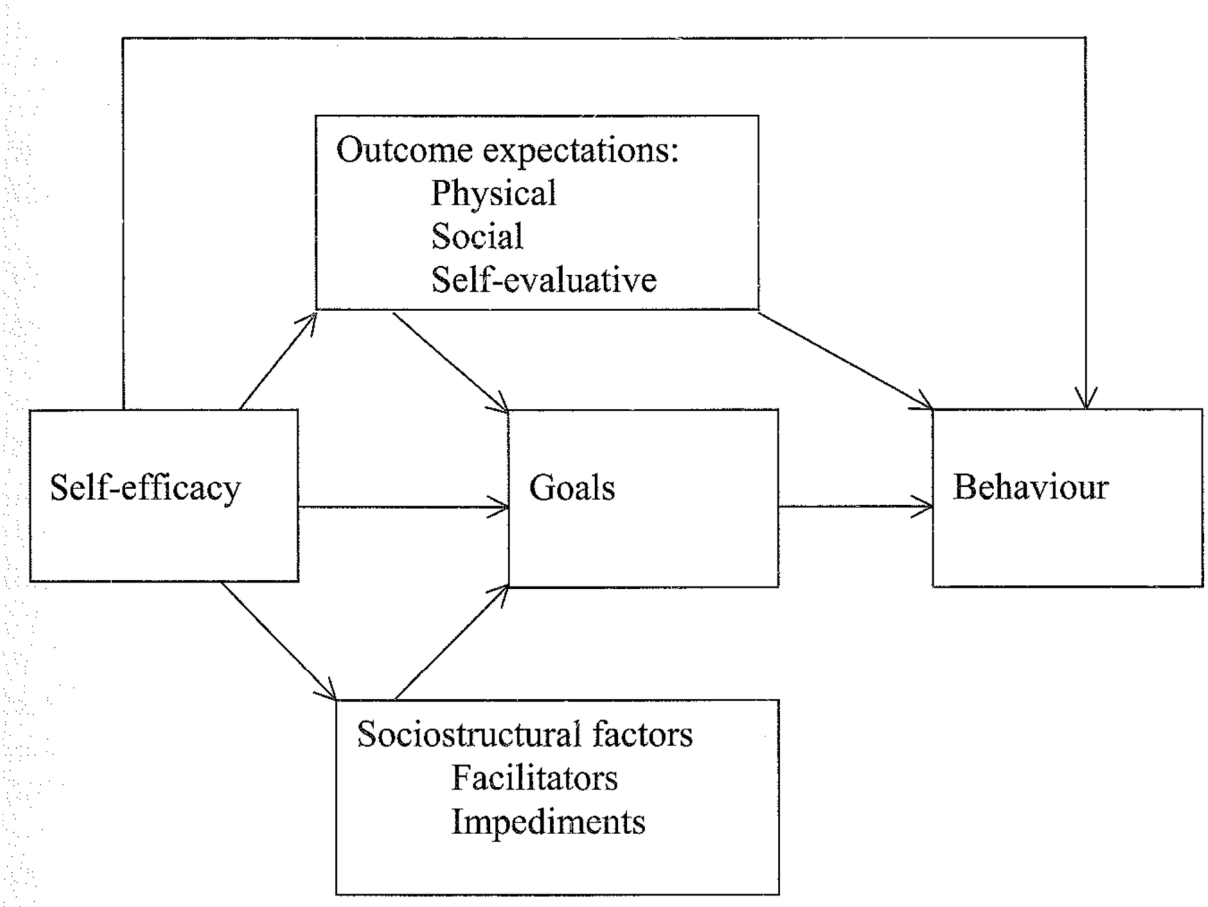

Figure 4.1 An illustration of social cognitive theory (see Bandura 2000b)

Self- Efficacy and Health Behaviors

Bandura describes behavior largely as a function of personal efficacy expectancies or beliefs about one's ability to perform specific behaviors in specific situations (Becker & Stuifbergen, 2004). Bandura suggests that self-efficacy varies according to the level of task

difficulty, the generalizability of self-efficacy from other tasks, and the confidence regarding ability to perform the task. In regards to this research study, self-efficacy is defined as situation-specific self-confidence and has been shown to relate to exercise in general (Bandura, 1997; McAuley, 1992; Rodgers, Hall, Blanchard, McAuley, & Munroe, 2002; Rodgers & Sullivan, 2001), as well as to exercise adherence (e.g., Bandura, 1986; Grace et al., 2002; Luszczynska & Sutton, 2006. Bandura (1995, 1997) suggests that for health behaviors, self- efficacy for performing the task, in general, is not as important as the self-efficacy for performing the task when a person encounters aversive circumstances.

However, these judgments of self-efficacy can vary across activities and life circumstances (Bandura, 1982), including the college years for adolescents and young adults. In relation to enhancing positive health outcomes, Strecher, DeVellis, Becker, and Rosenstock (1986) conclude that self-efficacy discriminated whether one will engage in health behaviors, including exercise and proper dieting. Self-efficacy influences which challenges people decide to face and how high they set their goals (Luszcynska & Schwarzer, 2005). As such, individuals with high self-efficacy in a specific domain often choose more challenging and ambitious goals. According to DeVellis and DeVellis (2000), high self-efficacy contributes to goal setting as well as diligent persistence in pursuing the goal. In addition, self-efficacy encourages the effective use of cognitive resources, assessing and problem-solving for solutions when an individual is faced with obstacles (Maddux and Lewis, 1995).

Outcome Expectancies and Health Behaviors

Outcome expectancies have been shown to influence behavior. The concept of outcome expectancy can be defined as the outcomes people expect their actions will produce (Bandura, 2004). Outcome expectancy can be implemented in three different forms: physical (pleasurable

and aversive effects of behavior), social (social approval or disapproval) and self-evaluative reactions (people assume personal standards and regulate their behavior by their self-evaluative reactions; Bandura, 2004). The SCT highlights that health behavior is also affected by the outcomes people expect their actions to produce. Specifically, the physical outcomes include the pleasurable and aversive effects of the behavior and the accompanying material losses and benefits. The social approval and disapproval the behavior produces in one's interpersonal relationships is the second major class of outcome expectancy. This third set of outcomes emphasizes the positive and negative self-evaluative reactions to one's health behavior and health status. People adopt personal standards and regulate their behavior by their self-evaluative reactions. Bandura (2004) postulates that individuals engage in activities that give them self-satisfaction and self-worth and refrain from behaving in ways that breed self-dissatisfaction. Therefore, motivation is heightened by assisting people to see how habit changes are in their self-interest. Lastly, an individual's personal goals, embedded in a value system, may provide further self-incentives and guides for health habits (Bandura, 2004).

Facilitators of Exercise Behaviors

Social support. Social support can be demonstrated in several forms with different implications for behavior: social support has been divided into directive and non-directive or autonomy-supportive on the one hand (Fisher, La Greca, Greco, Arfken, & Schneiderman, 1997; Ryan & Deci, 2000), and informational, emotional and instrumental or tangible on the other (Antonucci, 2001). For example, in the case of attempting to change one's physical activity, social support could be emotional (e.g. encouraging to exercise), tangible (e.g. providing access to exercise equipment), informational (e.g. providing advice on exercise) or instrumental (e.g. changing schedules to integrate daily exercise). In this study, social support can be recognized as

a facilitator to predict the exercise behavior for college students with disabilities. Social support provided by friends or family members has been found to supplement both initial weight loss and maintenance of healthy weight (Wing & Jeffery, 1999), leading to an increase in general health. Social support works primarily indirectly through its influence on self-efficacy, according to SCT (Bandura, 1997).

Climate towards disability. Students with disabilities who do attend college, face challenges when adjusting to a new environment (Dowrick, Anderson, Heyer, &Acosta, 2005; Newman et.al, 2009). Some of these challenges may include the quality changes in instructional demands (McGuire, Scott, & Shaw, 2003; Scott et al., 2003), negative faculty attitudes, the quality of postsecondary disability support services (Brinckerhoff, 1996; Finn,1998; Janiga & Costenbader, 2002), and new demands related to disability disclosure and advocacy within the college settings (Janigna & Costenbader, 2002; Sitlington, 2003). Hence, the climate and environment embedded within the college setting may be a facilitator in assisting college students with disabilities to engage in exercise behavior.

In addition, interactions with faculty influence the overall college experience for students with disabilities (Dowrick, Anderson, Heyer, & Acosta, 2005; Madaus, Scott, & McGuire, 2003). The attitudes of faculty members towards students with disabilities, their knowledge of disability and laws, and their specific classroom teaching practices can positively or negatively influence the student's experience (Beilke & Yssel, 1999; Dowrick et al., 2005; Hartman-Hall & Haaga, 2002). As a result, prior research suggests these attitudes may be related to the individual with a disability feeling comfortable and motivated to engage in health behavior while attending post-secondary education. By colleges and universities broadening support for students with disabilities to include increased mentoring, advocacy skill building, coaching, and social skills

training, students may be more apt to participate in exercise behaviors leading to an increased quality of life and positive well-being.

Impediments to Health Behaviors

Stress. The transition from childhood to young adulthood, often marked by enrolling in college, may be a predominantly stressful time (McNamara, 2000). For the purpose of this study, stress will be examined as a perceived risk and impediment within the SCT model which may predict exercise behavior for college students with disabilities. Nearly 60 percent of college students report having high or very high stress levels (Makrides,Veinot, Richard, McKee, & Gallivan, 1998). The term emerging adulthood has been proposed by Arnett (2000) to describe the socially constructed period of extended adolescence that occurs in developed countries when higher education (or some other form of preparation for adulthood) is undertaken. During this time period, adolescents are typically encountering a significant number of stressors (e.g. financial hardships, peer relationships, body image perceptions, and academic success) and how they cope with these stressors or hassles may affect their choice in healthy behaviors. In general, the separation of an individual from his or her family, friends, and neighborhood to attend a university may have a lasting effect on the individual's future development (Dobbing, 1982).

Moreover, all college students often face unique familial, cultural, and social transitions that may make the transition to, and completion of, postsecondary school challenging (Ishitani, 2003; Strayhorn, 2006). Other researchers have found that students with disabilities often struggle adjusting to the increased instructional demands within university environments (Finn, 1998; Janiga & Costenbader, 2002; McGuire, Scott, & Shaw, 2003; Scott, McGuire, & Shaw, 2003). Furthermore, college students with disabilities may not have the appropriate resources to

engage in exercise behaviors to assist in the coping process of stress during the college experience.

Alcohol abuse. Alcohol abuse is common among the young adult population and potentially quite problematic within the college population. Research supports that the developmental time frame from late adolescence to early adulthood is associated with the highest prevalence of alcohol consumption (Johnston, O'Malley, Bachman, & Schulenberg, 2009). Furthermore, Pritchard, Wilson, and Yamnitz (2007) found that early negative coping tactics and perfectionism predicted later alcohol use in a sample of undergraduate students. Based on SCT, one of the variables predictive for individuals to engage in exercise behavior is coping with life stressors. Hence, the college student with a disability who is struggling to cope with the stressors related to the new college experience, may engage in alcohol abuse which may impact their desire to engage exercise behavior.

For the purpose of this study, alcohol abuse was examined as a risk in predicting the variability of a college student to engage in exercise behavior. Currently, one of the prominent approaches to treating problematic alcohol abuse is to train clients to better manage their stress through healthy coping skills (Leonard & Blane, 1999; Marlatt, 1996). Additionally, other research has supported that alcohol abuse can be decreased with additional approaches to stress reduction, such as biofeedback and meditation (Yost & Mines, 1985). Based on these findings, students with disabilities in college, who are already susceptible to higher stress levels, may engage in alcohol abuse and can significantly benefit from positive health behaviors, including exercise.

Physical barriers to exercise. While the importance of physical activity in improving health and wellness for people with disabilities is evident and several disabilities can be delayed

or even prevented with positive health habits, the majority of people with disabilities are not active at the levels needed to achieve the physical and mental health benefits (US Department of Health, & Human Services, 2006). Additional evidence has demonstrated that people with disabilities have higher rates of obesity than those without disability, which is in part attributed to limitations in physical activity. Inactivity, specifically, has been cited as a major contributing factor in deteriorating aerobic capacity, muscular fitness, and flexibility, ultimately poor general health (Malone, Barfield & Brasher, 2012).

Some of the barriers to decreased exercise behavior have included: the cost of a fitness program, lack of awareness of fitness facilities, lack of access to fitness facilities, lack of transportation to a fitness center, and lack of knowledge of how or where to exercise (Malone et. al, 2012). As a result, individuals with disabilities have restricted functional independence and increasing risk for chronic disease complications (Cooper et al.,1999; Rimmer, Braddock & Pitetti, (1996). Furthermore, health professionals and researchers have currently reported that other factors within the environment impact exercise behaviors for persons with disabilities such as: limited accessibility, minimal informed knowledge, and perceived prejudiced policies (Malone et al., 2012). Therefore, the physical barriers as well as various other factors influencing exercise behavior are important considerations for this study as impediments based on the constructs of SCT.

Research Question and Hypothesis

To what extent are the SCT constructs of impediments (e.g. stress, alcohol abuse and physical barriers to exercise), facilitators (e.g. climate towards disability and social support), and exercise self-efficacy and exercise outcome expectancy predictive of exercise behaviors for college students with disabilities? For this research question, it is hypothesized that each set of SCT predictors will significantly impact the effect size of the overall regression model.

Chapter 2

Literature Review

Physical activity and exercise behavior are both important to physical health. According to the Physical Activity Guidelines for Americans Report (2008), physical activity is defined as any physical movement produced by the contraction of skeletal muscle that increases energy expenditure above a basal level. Commonly used categories include occupational, leisure time or recreational, household, self-care, and transportation or commuting activities. Exercise is a subcategory of physical activity that is planned, structured, repetitive, and purposive in the sense that the improvement or maintenance of one or more components of physical fitness is the objective (Rimmer, Chen, McCubbin , Drum , Peterson, 2010). Health is defined as a state of complete physical, mental, and social well-being, and not merely the absence of disease (WHO, 2005). As such, engaging in exercise behavior can be a significant factor to optimize an individual's overall health and well-being. On a societal level, the health benefits of physical activity described in the US Surgeon General's Report on Physical Activity and Health (2008) provide ample reasons to adopt and maintain an active lifestyle (Buckworth & Nigg, 2004). The most current research established physical activity guidelines for the United States recommending that adults should complete a minimum of 150 minutes of moderate, or 75 minutes of vigorous, physical activity per week (or in combination); twice this amount is recommended for additional health benefits (U.S. Department of Health and Human Services, 2008).

Within the last decade, obesity has been recognized as one of the most significant threats to an individual's overall health and well-being. It is widely known that the vast majority of adults in the United States and Canada are obese or overweight (Tjepkema, 2006; U.S.

Department of Health and Human Services, 2008), and obesity is expected to overtake smoking as the leading cause of death in the United States (Mokdad, Marks, Stroup, & Gerberding, 2004). According to the U.S. Surgeon General (U.S. Department of Health and Human Services, 2001), the financial price of obesity has surpassed $100 billion annually, and sedentary lifestyles are partially blamed for this cost, with less than one third of adults engaging in the amount of physical activity recommended for maintaining health. Obesity is correlated with negative health and psychosocial consequences varying from an increased risk of cardiovascular disease, diabetes, and liver disease to depression, low self-esteem, and stigmatization (United States Department of Health and Human Service, 2001). Health policy and research has indicated through various measures that a significant amount of individuals choose not to engage in any physical activity during their leisure time (Centers for Disease Control and Prevention, 2005). Interestingly, individuals who are not engaging in physical activity may be unaware of the psychological, financial and physical advantages to increasing exercise behaviors, even at a moderate level.

Furthermore, the beneficial effects of physical activity on psychological well-being have been documented within the medical and health professional disciplines (McAuley & Rudolph, 1995; Netz, Wu, Becker, & Tenenbaum, 2005; Ransford & Palisi, 1996). According to the Association for Applied Sport Psychology (2012), exercise can foster the psychological wellbeing of an individual as well as improve quality of life. Current literature suggests that the participation in sporting activities for individuals with disabilities can increase their perception of wellbeing by changing how they think and feel about themselves. Additionally, engaging in physical exercise can foster community inclusion by decreasing public stigma and influencing

how other individuals think and feel about people with intellectual disabilities (Sport for Development and Peace International Working Group 2008).

According to the Healthy People 2020 statistics, one of the primary threats to public health in the United States is obesity (U.S. Department of Health and Human Services 2010). Individuals with disabilities are recognized to have a high prevalence and incidence of secondary conditions including overweight and obesity (Lynch & Chiu, 2009). Fortunately, by managing their health habits and behaviors, individuals with or without disabilities can live longer and healthier while reducing the aging process leading to a better quality of life (Bandura, 2000). From a global perspective, according to the World Health Organization (WHO, 2008), individuals can prolong their life expectancy by eliminating risk factors often associated with certain behaviors, such as tobacco, alcohol, and substance use, unhealthy diet, and low physical inactivity (WHO, 2008). A vast amount of research suggests that the general population experiences significant advantages from consistent, regular physical activity, including the improvement in levels of physical (e.g. aerobic capacity) and psychological functioning (depression) (Cooper et al., 1999). More understanding is still needed about how physical activity and exercise influence disability populations due to their unique susceptibility to health risk factors and secondary conditions that are often related to a primary disability.

Exercise Behaviors for Individuals with Disabilities

The Surgeons General Report on Physical Activity and Health (2008) provides recommendations for moderate activity; however, these suggestions are primarily addressing individuals without disabilities (Cooper et al., 1999). To increase and maintain consistent exercise behaviors among people with disabilities, one needs to understand the factors that promote or prevent exercise, then apply this conceptualization to alter the environment or

develop appropriate exercise opportunities for this specific population, regardless of the type of disability.

There are numerous benefits to exercise and physical activity for individuals with disabilities. Consistent exercise has been found to reduce the negative impacts of secondary conditions and improve or maintain daily functional performance (Stuifbergen, Becker, Blozis, Timmerman, & Kullberg, 2003). Epidemiological research suggests that physical activities may improve an individual's quality of life. For example, engaging in physical activities within community settings (e.g., team sports, gym facilities, activity clubs) may be a viable option for people with disabilities to become more involved within the community by developing a social network while gaining positive physical health rewards. As such, the successful inclusion of people with intellectual disabilities in community-based physical activities should be a planned, regular activity along with targeted strategies to address the skills and attitudes of the community and members in that environment (Nankervis, Cousins, Válková & Macintyre, 2013). In addition to the development of sporting skills, a program such as special olympics promotes social inclusion by offering athletes a platform to socialize with peers and to take part in the life of their community (McConkey, Dowling, Hassan, & Menke (2012).

Exercise has been studied as a therapeutic intervention for people with various disabilities. For example, Faulkner & Sparkes (1999) have noted that physical activity may assist individuals in managing the symptoms of schizophrenia. For people with intellectual disabilities, physical activity and exercise can provide opportunities to engage in experiences that provide physical, psychological, and social benefits (Nankervis, Cousins, Válková & Macintyre, 2013). Marge (1988) defined secondary conditions as those illnesses that may be experienced by individuals after they have a primary (or first) disability. These conditions may range from

medical complications (e.g., such as pressure sores and urinary tract infections) to problems of psychosocial modification (e.g., depression), and to environmental and quality of life issues (e.g., disability associated with access barriers) (Seekins, Smith, McCleary, Clay, & Walsh, 1990). Moderate exercise can also help prevent many secondary health conditions prevalent in this population, including cardiovascular disease, high blood pressure, obesity, Type II diabetes, and mental health difficulties (Johnson, 2009).

According to Malchow and colleagues (2013), modern therapeutic approaches should include physical exercise as part of a multimodal intervention program to improve psychopathology and cognitive symptoms in people with schizophrenia and affective disorders. Recreational activity is purported to enhance the physical and social self of individuals with physical disabilities (Blinde & McClung, 1997). In addition, exercise improves the health-related physical fitness of individuals with intellectual disabilities (Chainais, Reid, & Hoover, 1998). In a longitudinal epidemiological study, subjects with regular physical activity had lower incidence of mental health diagnoses (Strohle et al., 2007).

Unfortunately, individuals with disabilities face numerous obstacles preventing them from engaging in exercise behaviors or physical activity. Healthy People 2010 noted that individuals with disabilities were more likely to encounter problematic and environmental barriers than individuals without disabilities (55% vs. 43%). Some of these obstacles may include access to facilities, natural and built environment barriers, financial hardships, equipment suitability, perceptions and attitudes toward disability, and the lack of availability of resources (Cooper, Quatrano, Axelson, & Harlan (1999). Additionally, according to the Center for Disease Control and Prevention (2005), people with disabilities who do not engage in physical activity within the home or in the workplace represent more than 20% of the United States population

(CDCP, 2005). Based on these statistics, it can be assumed that individuals with disabilities are at a greater risk to not engaging in physical activity and exercise.

Furthermore, persons with a chronic illness or disability are at increased risk for obesity (Rimmer, 1999), mental health complications (Turner & McLean, 1989), and substance abuse issues (Janikowski, Cardoso & Lee, 2005) compared to the general population. According to Farnam, Zipple, Tyrrell, and Chittinanda (1999), 60% of individuals with severe mental illness participate in minimal levels of physical activity and are considerably less active than the general population (Daumit et al., 2005). Similarly, peak aerobic capacity in both youth and adults with Down syndrome is much lower when compared to their age related peers without disabilities (Baynard, Pitetti, Guerra, Unnithan, & Fernhall, 2008; Fernhall, Millar, Tymeson, & Burkett, 1990; Fernhall & Pitetti, 2001). The behavioral health disparities between individuals with disabilities and those without disabilities is a concern that needs to be addressed within the rehabilitation counseling discipline and in society. Essentially, reducing the health disparities cannot be achieved in isolation. It depends on the core principles including non-discrimination, autonomy, participation and social inclusion, respect for difference, accessibility, and equality of opportunity and respect for the evolving capacities of all individuals (WHO, 2008).

Furthermore, it was noted in the World Health Organization Report (2011) that individuals with disabilities develop the same health problems that affect the general population, such as influenza and pneumonia. However, a significant portion of individuals with disabilities are more susceptible to developing chronic conditions due the lack of physical activity and exercise behavior (Rimmer & Roland, 2008). For example, Havercamp, Scandin, and Roth (2004) documented that adults with developmental disabilities had a similar or greater rate of

chronic health conditions such as high blood pressure, cardiovascular disease, and diabetes than people without disabilities.

Recently, there has been evidence that the negative effects of secondary conditions for people with disabilities, as well as society as a whole, can be managed and even prevented with health promotion activities including, but not limited to, exercise behavior (USDHHS, 2010). For example, a physical activity program specifically targeted and developed for stroke survivors resulted in substantial physical and psychological benefits (Rimmer, Braunschweig, & Silverman K et al., 2000). Similarly, individuals with Parkinson's disease who participate in exercise programs have reported a better quality of life and demonstrated increased walking ability, balance, strength, flexibility, and cardiovascular fitness compared with those who did not exercise (Ellis et al., 2011). Additionally, exercise based interventions that have a disability focus, have been noted as an important component of a multidisciplinary approach to long-term management of disabilities, such as Parkinson's disease (Horstink, Tolosa, Bonuccelli , et al., 2006; Wade, Gage, Owen et al., 2003; Ellis, Katz , White, et al., 2008). This current literature supports that individuals with disabilities who engage in exercise behaviors may have better overall physical health than those who do not have any physical activity.

Research also suggests that a sedentary lifestyle which has been related to cardiovascular disease, insulin resistance syndrome, and obesity are more common amongst individuals with intellectual and developmental disabilities such as autism spectrum disorder, in comparison to those without disabilities (Chanias, Reid, & Hoover, 1998; Draheim et al., 2002; Janicki & MacEachron, 1984; Rimmer, Braddock, & Fujiura, 1993, 1994; Rimmer, Braddock, & Marks, 1995). Similarly, Draheim, Williams, and McCubbin (2002) reported survey results suggesting that 47–51% of older individuals with intellectual disabilities, including, but not limited to,

autism spectrum disorder, residing in community settings may be living dangerously sedentary lifestyles. Folkins and Sime (1981) found general psychological improvement for children with intellectual disabilities with exercise plans in comparison to those without exercise plans. With such prevailing evidence that sedentary lifestyles appear to be an underlying concern for individuals with disabilities, it is essential that the rehabilitation counseling discipline highlight efforts to decrease inactive lifestyles with health promotion efforts addressing the special needs for individuals with physical and intellectual disabilities.

The International Classification of Functioning, Disability and Health (ICF) model provides a useful framework for organizing factors associated with exercise behavior (Ellis et al., 2011). This model perceives human functioning and disability in three domains (i.e., body functions and structures, activity, and participation) as the product of a powerful interaction of health conditions, personal factors, and environmental factors (Jette, 2006). Exercise behavior viewed in the participation domain can be assumed as a daily situation in which an individual seeks to maintain, promote, or improve his or her personal health through structured physical activity (Ellis et al., 2011). In general, exercise behavior often is not a priority for individuals with disabilities. According to Ryan, Patrick, Deci & Williams, 2008, if such behaviors are to be successfully implemented and maintained outside of treatment settings or controlled environments, individuals must come to value the behaviors and personally validate their significance.

Exercise Behaviors for College Students

In fall 2015, approximately 20.2 million students are expected to attend American colleges and universities, constituting an increase of about 4.9 million since fall 2000 (NCES, 2014). According to the 2002 report of the National Health and Nutrition Examination Survey,

the greatest increases in overweight and obesity appear to occur in persons between the ages 18 and 29 years (Flegal, Carroll, Ogden & Johnson, 2005). Obesity is associated with negative health and psychosocial consequences, ranging from increased risk of cardiovascular disease, diabetes, and liver disease to depression, low self-esteem, and stigmatization. The college years are a vulnerable period for weight gain with males and females gain between 3 and 4.3 kg during the first year and 1.7 kg (females) and 4.2 kg (males) from matriculation to graduation. Given these trends, weight gain prevention programs with college students have been evaluated. As adolescents transition into college, this time frame is a critical period in self-exploration, self-awareness and personal development which impacts psychological and physical wellbeing. According to Buckworth and Nigg (2004), decreasing accessibility from major competing sedentary activities while increasing the accessibility and reinforcement values of exercise and physical activity can have direct and long-term health benefits for college students. Weight gain and behavioral patterns during the college years may contribute to overweight and obesity into adulthood (Racette et al., 2005). Therefore, it is critical to take a preventative approach to manage obesity and improve overall health during this time period of the college experience.

The long-term gains of exercise behaviors are well recognized for all individuals, regardless of age, however, it appears that the college population may be at a greater risk to sedentary activities. Likewise, the National Heart, Lung, and Blood Institute's Growth and Health Study conducted by Kimm, Glynn, Kriska, et al. (2000) included a 10-year annual assessment of physical activity in 2,322 girls beginning at ages 9 to 10 and showed tremendous reductions in physical activity by age 18 to 19 years (Racette et al. 2005). Additionally, the greatest decline in physical activity has been observed between the ages of 15 and 18 years, and a continuous decrease is typical between 18 and 29 years of age (Caspersen, Pereira, Curran,

2000). These statistics validate the need to focus on increasing exercise behaviors for all students with or without disabilities.

However, individuals typically base their decisions to engage in a particular activity on access (the work needed to obtain the activity) and motivation (the reinforcing value of the activity) (Buckworth & Nigg, 2004). Despite the fact that college students have unique time constraints related to their academic schedules, they also tend to have a considerable amount of discretionary time. Hence, the choices these students make about how to spend this time impact their level of physical activity, and various factors influence these choices (Buckworth & Nigg, 2004). Furthermore, evidence from the 1995 College Health Risk Behavior Survey indicates that dietary and activity patterns of several college students predispose them to future health problems leading to negative general health outcomes (Racette et al., 2005).

Exercise Behaviors for College Students with Disabilities

There has been a large increase in the number of individuals with disabilities attending college in recent years. According to Cook, Rumrill & Tanskersky (2009), students with diagnosed disabilities are entering higher education more than ever. Specifically, the proportion of college freshmen with disabilities tripled from 1978 to 1998, rising from less than 3% to approximately 9% (HEATH Resource Center, 1999). It should be noted that this number underestimates the prevalence of students with disabilities in higher education, because several students do not choose to self-identify their disabilities (Cook et al., 2009). Students with disabilities who attend higher education have an overall improved quality of life and social life, and the adaptation to coping with their disability is easier when compared to peers with disabilities who do not attend higher education. Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) of 1990 mandated that students with disabilities

must have an equal opportunity to attend institutions of higher education. A college graduate with a disability is three to five times more likely to be employed than a person with a disability who never attended college (United States Department of Labor, Employment, and Training Administration, 2004). Therefore, having adequate access to colleges and universities is not only a legal and moral imperative, but it also represents a tremendous opportunity for people with disabilities to improve their overall quality of life (Cook et al., 2009).

Due to the increase in number of individuals with disabilities attending college, it is evident that addressing exercise behaviors during the college years is significant. Consequently, rehabilitation counseling professionals should highlight the intervention strategies, accessibility and other needs for college students with disabilities. The rewards to increasing physical activity and exercise behaviors may result in healthier lifestyles preventing secondary conditions in their adult years. Students with disabilities face a number of significant challenges adjusting to postsecondary school and have unique transition needs (Brinckerhoff, 1996; Sitlington, 2003). For example, several students with autism spectrum disorder have difficulty navigating large campuses and may find smaller college campuses easier to navigate and less overwhelming (Harper, Lawlor, & Fitzgerald, 2004; Moreno, 2005; Willey, 2000; Williams & Palmer, 2004). Furthermore, an often overlooked fact is that in most college settings, students are responsible for advocating for themselves (Williams & Palmer, 2004). This means that they must establish contact with the school's disabilities office to disclose their disability and approach professors to indicate the accommodations that they will need to be successful (Adreon & Durocher, 2007). That said, college students with disabilities may encounter stigma, lack of confidence and lower self-efficacy crippling them from advocating for themselves in the college setting.

One way to empower individuals with physical and sensory disabilities is through sport and physical fitness activities. Active participation in an active setting emphasizes characteristics such as achievement and mastery, and often encourages the development of self-efficacy, goal setting, cooperation, and competitiveness (Greenwood, Dzewaltowski, & French, 1990; McPherson, Curtis, & Loy, 1989). Furthermore, the physical activity and exercise context is an avenue in which students can respond to challenges and interact in problem-solving behavior. As a result, college students with disabilities may develop empowering skills that positively influence successful outcomes in physical activities, but also enhance effectiveness in other various life situations (Blinde & Taube, 1999). Health practitioners, rehabilitation professionals and college administrators need to recognize the connection between health, disability and exercise behavior in order change to be made within the higher educational system.

Social Cognitive Theory and Exercise Behavior

There are several health promotion models that focus on the correlation of exercise behavior for individuals with disabilities. The social cognitive theory (SCT) specifies a core set of determinants, the means through which they work, and the optimal ways of translating this knowledge into effective health practices (Bandura, 2004). Exercise behavior and determinants can change over time and it may be too simplistic to depict individuals as either sedentary or active (Buckworth & Dishman, 1998). Therefore, the SCT has been recognized as one framework to examine how and why an individual will engage in exercise behaviors. This literature review will examine SCT core principles and correlate these unique concepts to exercise behaviors that ultimately lead to increasing an individuals' overall health. Various health promotion models have been utilized as theoretical foundations in the rehabilitation counseling discipline when examining exercise behaviors for individuals with disabilities. SCT

was chosen for this study for several reasons. Research suggests that individuals are motivated to positive behavioral change with an increase in self-efficacy, a core principal within the SCT framework. Additionally, it has been documented that students are determined to implement change based on the constructs of SCT, such as self-efficacy, goal setting and vicarious learning in social situations. Hence, this psychological thought process could be transferrable to how college students engage in exercise behavior underpinning the concepts of goal setting, outcome expectations and self-efficacy. Self-efficacy is substantiated as learners observe goal progress, which conveys the individuals are becoming skillful (Elliott & Dweck, 1988). Providing students with feedback on goal progress also raises self-efficacy (Bandura & Cervone, 1983). This heightened self-efficacy can sustain motivation and increase skill development. The difference for college students with disabilities versus those without disabilities is that students with disabilities are sometimes challenged emotionally, physically and psychologically while dealing with the unique challenges presented by their disabilities, and to matriculate successfully into a new collegiate environment (Hadley, 2011).The challenge of barrier removal is complex (e.g., provision of physical access to buildings and appropriate assistive technologies) and can be costly; it includes issues of attitudes and policies (Tomlinson, Swartz, Officer, Chan, Rudan, Saxena,2009). The most current science in health promotion research generally runs on two parallel tracks: one designed for the general population where most of the resources are directed, and the other track for disability specific research with significantly less resources. (Rimmer et al., 2014).

The Health Action Process Approach, the Health Promotion Model and Health Belief Model have all been valuable theoretical foundations used to investigate health promotion efforts and exercise behaviors for individuals with disabilities. However, the following reasons will

justify why these previous models were not chosen to examine college students with disabilities in this research study.

The Health Action Process Approach has been demonstrated in health and rehabilitation research (e.g. Chiu et al., 2011). It has been used to study health promoting behaviors of middle-aged women (Barg et al., 2012), older adults (Caudroit, Stephan, & Le Scanff, 2011), men who have sex with men (Teng & Mak, 2011), people with cardiovascular disease (Scholz, Sniehotta, & Schwarzer, 2005), people with acquired physical disabilities (Perrier, Sweet, Strachan, & Latimer-Cheung, 2012), and people with multiple sclerosis (Chiu et al., 2011). However, the HAPA model has not been used to support examination of college students with disabilities, warranting a limitation to utilization of this model for this subgroup**.** On the contrary, the SCT has been used successfully when assisting individuals with disabilities because a majority of the models of health behavior are concerned only with predicting health habits. Social cognitive theory suggests both predictors and principles on how to inform, enable, guide, and motivate people to adapt habits that promote health and reduce those that impair it (Bandura, 1997).

The Health Promotion Model (HPM) developed by Pender (1982) is an approach oriented model. Evidence supporting this model focus on the assisting individuals with disabilities across the lifespan (Pender, 1982). The application of this model is applicable to any situation in which threat is not a determinant to motivation to engage in a health behavior (Lynch, 2009). However, this study includes factors that may be considered threats such as alcohol use, stress and the physical barriers within the college setting, all which can be viewed as threats to motivate an individual to engage in health behavior. Additionally, this research is focused on individuals with disabilities in the college experience and not the lifespan. Thus, Penders' Health Promotion Model was not chosen for this study.

The Health Belief Model (HBM) hypothesizes that individuals are likely to engage in a given health-related behavior to the extent that they (a) perceive that they could contract the illness or be susceptible to the problem (perceived susceptibility); (b) believe that the problem has serious consequences or will interfere with their daily functioning (perceived severity); (c) believe that the intervention or preventative action will be effective in reducing symptoms (perceived benefits); and (d) perceive few barriers to taking action (perceived barriers). All four variables are thought to be influenced by demographic variables such as race, age, and socioeconomic status (Henshaw & Freedman-Doan, 2009). The HPM does not integrate self-efficacy, outcome expectations or social components (social support, college climate, or goal setting) which have been documented to motivate behavioral change in health promotion efforts. Therefore, this model was not the most chosen to investigate college students with disabilities and exercise behavior.

Health Self- Efficacy

Essentially, the SCT relates self-efficacy to an ability to cope with barriers and stressors "effectively and consistently under difficult circumstances," and Bandura (2004) suggests that self-efficacy is promoted through mastery experiences such as attainment of proximal goals (Bandura, 2004). In the context of health and exercise behaviors, individuals with increased self-efficacy, therefore, would be associated with persistence in exercise, even in the face of challenging barriers (e.g., time, accessibility, resources). Additionally, Bandura (2004) proposes that when an individuals' self-concept (e.g., physical self-concept) is improved, they tend to be more confident in their abilities, expect greater successes, and thus become more persistent with engaging in physical activity behaviors (Bandura, 2004). Also, individuals with greater self-

efficacy may be more apt to engage in physical activity and exercise behavior if they are aware of the benefits associated with exercise behaviors.

Although efficacy beliefs are multifaceted, social cognitive theory identifies several conditions under which they may co-vary even across distinct domains of functioning (Bandura, 1997). Bandura (2006) proposes that proficient performance is moderately guided by higher-order self-regulatory skills. Essentially, these abilities include generic skills for diagnosing task demands, constructing and evaluating alternative courses of action, setting proximal goals to guide one's efforts, and creating self-incentives to remain engaged in activities and to manage stress and debilitating intrusive thoughts (Bandura, 2006). As a result, the generic self-management strategies developed in one realm of activity are often transferrable in other activity domains with resulting co-variation in perceived efficacy among them (Bandura, 2006). In the context of college, an increase in exercise self-efficacy may begin transfer this efficacy to various aspects of college life such as academic success and adoption of generally healthier lifestyle.

Exercise Outcome Expectancy

The second principle applicable to SCT is outcome expectancy. Bandura (2004) argues that an individual will engage in constructive behavioral change if they are aware of a specific, desired outcome expectancy. Perceived self-efficacy is a judgment of capability to execute given types of performances; outcome expectations are judgments about the outcomes that are likely to flow from these executed performances. Outcome expectations entail three unique forms (Bandura, 1986). They include the positive and negative physical, social, and self-evaluative outcomes that an individual intends to result from performing a specific behavior (Bandura, 2006). Within each form, the positive expectations serve as incentives and or facilitators while

the negative expectations as disincentives. The outcomes people anticipate depend largely on their judgments of how well they will be able to perform in specific situations, while taking into consideration the barriers within a situation. As such, exercise outcome expectancy would include specific outcomes that could include weight loss, longevity, increase in psychological well-being and positive healthy nutritional options.

Furthermore, in order to implement health-promoting behaviors such as exercise and physical activity, the intention has to be transformed into specific instructions of how to perform the desired action such as what exercise equipment to buy, when and how often to exercise, and when and where to exercise (Chiu et al., 2012). Within the context of the college setting, an individual with a disability may have unique needs to address these questions versus a non-disabled college student due to overcoming obstacles including, but not limited to environmental barriers.

In general, expectancies according to heuristics may be divided into three forms: (a) expectancies about environmental cues (that is, beliefs about how events are connected- about what leads to what); (b) expectancies about the consequences of one's own actions (that is, opinions about how individual behavior is likely to influence outcomes which is outcome expectancy); (c) expectancies about one's own competence to perform the behavior needed to influence outcomes which is self-efficacy (Rosenstock, Strecher, & Becker, 1998).

Secondly, incentive is defined as the value of a particular object or outcome. The outcome may be health status, physical appearance, approval of others, economic gain, or results. Behavior is regulated by its consequences (reinforcements), but is very subjective based on how those consequences are interpreted and conceptualized by the individual (Rosenstock et al., 1998). For example, an individual with a disability in the college setting may have an incentive

to prevent a secondary condition, where as an individual without a disability may have a much different desire outcome for engaging in exercise behaviors. Individuals who find importance in the perceived effects of changed lifestyles (incentives) will attempt to change if they believe that (a) their current lifestyles pose threats to any personally valued outcomes, such as health or appearance (environmental cues); (b) that particular behavioral changes will reduce the threats (outcome expectations); and (c) that they are personally capable of adopting the new behaviors (efficacy expectations) (Rosenstock et al., 1998). Therefore, the goal of a rehabilitation counselor is to assist people with disabilities to achieve maximum psychological, social, vocational, economic independence, and quality of life to their fullest capacity. This foundation and premise of rehabilitation counseling highlights empowerment in which individuals exercise control over their own lives which would resonate with the assisting college students with disabilities to implement change based on their own perceived incentives.

The SCT principles propose that health and exercise behavior is also affected by the outcomes people expect their actions to produce. The physical outcomes include the pleasurable and aversive effects of the behavior and the accompanying material losses and benefits (Bandura, 2004).

Facilitators of Exercise Behavior for College Students with Disabilities

Social support. A small body of literature specifically addresses student adaptation to college for individuals with disabilities. Predictors of student adaptation to college for individuals with disabilities researched in past literature have included problem solving skills, stressful events, perceived social support, resource use, and satisfaction with the disability resource office (Sanders & DuBois, 1996), attachment to parents and peers (Leatherman-Sommers, 1999), extra-curricular involvement (Miller, 2001), and perceived need for academic

and counseling support (Saracoglu, Minden, & Wilchesky, 1989). That being said, it would appear that providing adequate social support regarding exercise behaviors for college students with disabilities is of significance.

College is a place to develop friendships with individuals from diverse backgrounds as well as connecting with peers that have common interests. Furthermore, informal peer mentors have been justified as valuable to students with learning disabilities (LD) and/or attention deficit disorder (ADD) in discussing and reinforcing aspects of various classes (Kirby et al., 2008). This can be a reciprocal process in that students with LD and/or ADD/ADIJD who excel in various areas (e.g. academics, sports, or arts—can in turn mentor their peers (Connor, 2012). Based on this fact, an individual with a disability who is succeeding in physical activity or engaging in exercise may be highly influential to their peers.

A significant amount of literature suggests that external barriers have reported impact for people with disabilities, reflecting the effect of the disabling condition and the consequent difficulties with money, accessible facilities, transportation and social support participation (Becker, Stuifbergen & Sands, 1991). As such, this supports the social model of disability, which explains behavior regarding to social factors that limit people from participation and their psychological processes (Kinne, Patrick & Maher, 1999).

College climate. There has been an increase in students with disabilities entering higher education. Specifically, the proportion of college freshmen with disabilities tripled from 3% to 9 % in 1978 to 1998 (HEATH Resource Center, 1999). Thus, there are several positive aspects that relate to post-secondary education for individuals with disabilities. College students with disabilities view access to higher education as (1) an opportunity to enhance their chances of obtaining and maintaining employment (Fairweather & Shaver), (2) a means of earning a higher

annual income and (3) a pathway to life-long independence and a greater quality of life. With a greater number of students with disabilities enrolling in colleges and universities nationwide, it is become more apparent however, that many campuses are not equipped to meet the unique and varied needs of these students (Wilson, Getzel & Brown, 2000). Similarly, the needs and accommodations for individuals with disabilities to engage in exercise behaviors is a global concern in post-secondary education.

Stodden and Jones (2002) noted that the most influential barrier to students with disabilities was the negative attitudes about people with disabilities and their ability to be prosperous in higher education. This negative type of campus climate that postsecondary students with disabilities experience coincides with the societal discrimination that the disability community has experienced generally, which has led to a long history of segregation.

It is suggested in the literature that through the context of theory, educational institutions are instrumental in the student's psychological and sociological development (Chickering and Reisser 1993). As such, all incoming freshman students with or without disabilities must adjust intellectually and socially to the college setting (Astin 1985; Tinto 1993), and this adjustment typically requires a degree of physical separation and emotional detachment from peers or others who were central during high school, along with an acceptance of college-level expectations and procedures (Schlossberg, Lynch, and Chickering 1989).

Additionally, several researchers have found that students with disabilities sometimes face hardships when adjusting to the increased instructional demands within university environments (Finn, 1998; Janiga & Costenbader, 2002; McGuire, Scott, & Shaw, 2003). Furthermore, other scholars have argued that external factors within college environments, such as faculty attitudes toward students with disabilities and the provision and utilization of

accommodations, can impact student performance (Beilke & Yssel, 1999; Brinckerhoff, 1996; Dowrick, Anderson, Heyer, & Acosta, 2005). In general, students with disabilities encounter more difficulty in the adjustment to college settings than those without disabilities.

The college environment and climate can provide a strong foundation and serve as a facilitator to increased exercise behaviors for individuals with disabilities, according to social cognitive theory. The college climate can influence how well a student may or may not adapt to the college setting. Unlike the high school environment; however, it is the student's responsibility to facilitate requests for services in the postsecondary environment (Hadley, 2011). During the transition from high school to college, students with disabilities are expected to contact the Office for Students with Disabilities (OSD), self-identify as a student with a disability, provide documentation of their disability and the accommodations needed, self-advocate to their instructors, and engage in the services that will support their academic progress (Hadley, 2011).

It is also important to consider how disabilities may become a positive component of a student's identity, despite the fact that disability has been traditionally recognized as a negative characteristic (Linton, 1998; Weeber, 2004). Fortunately, an increase in students with disabilities are connecting with each other and finding ways to build communities, even if their college does not have a disability studies program (Hadley, 2011). For the purpose of this study, this social connection may be highly influential for peers to connect when engaging in exercise behaviors as well as increasing exercise self-efficacy in a safe and secure college setting for students to flourish. Also, these networks can even lead to better student activism and interests in disability issues and progressive disability services (Cory, White, & Stuckey 2010). The college climate can serve as a facilitator if the support connections between students with disabilities and their allies on campus

are positive. Lastly, providing numerous opportunities to build positive self- identity can help campuses feel more welcoming and provide safe places for students outside of the disability services offices (Cory, White, & Stuckey 2010).

Risks for College Students with Disabilities and Exercise Behavior

Alcohol. Alcohol use can be a risk for the college student population as students begin to transition into the life phase of adulthood. Heavy alcohol consumption is a behavior that is prevalent and problematic among college students with or without disabilities (Neighbors, Lee, Lewis, Fossos, & Larimer, 2007). Consequently, approximately 40%–45% of students nationwide report engaging in heavy episodic drinking (O'Malley and Johnston, 2002; Wechsler and Kuo, 2000). The outcomes of heavy drinking within the college population are extensive and include criminal behavior, academic problems, unwanted sexual experiences, injuries, and death (Hingson et al., 2002, 2005; Johnston et al., 2004; Wechsler et al., 1994). Prior research has identified several unique factors which have been associated with heavy drinking, including demographic characteristics (gender and fraternity/sorority membership); descriptive social norms; enhancement, social, coping, and conformity drinking motives; positive and negative alcohol expectancies; and subjective evaluations of positive and negative alcohol effects (Neighbors et al., 2007). Furthermore, a variety of social and cultural factors may also impact the increase of alcohol use and college students seeking counseling services. Some of these factors consist of divorce, family dysfunction, instability, unhealthy parenting skills, poor frustration tolerance, violence, experimentation with drugs, alcohol and sex, and poor interpersonal attachments may account for some of this increase in alcohol use (Gallagher, Gill, & Sysko, 2000). Therefore, alcohol may be a risk in deterring students with disabilities to engage in healthy coping mechanisms to manage the stressors of college transition and daily living skills.

For the purpose of this study, engaging in exercise behavior may be influenced by a college student who is drinking alcohol in order to manage the stressors within the college experience.

Lastly, according to Kessler, Foster, Saunders, and Stang (1995), there are four types of disorders (anxiety, mood disorders, substance abuse and conduct disorder) that have been recognized as "significant predictors of failure" (Kessler et al.,1995, p.1,029). Also, studies have found that high self-regard scores and high self -actualizing scores predict better physical health that can be a consideration for college students to engage in exercise behavior (Pritchard, Wilson & Yamnitz, 2007). Recent studies have found that alcohol abuse was predicted by low self-esteem. Additionally, self-esteem has also been found to relate to exercise participation in women, but not men. Fortunately, several other studies have found that self-efficacy predicts participation in health-related physical fitness activities regardless of gender (Pritchard et al., 2007). As noted above, the SCT underpinning remains to assist individuals in behavioral change by increasing self-efficacy.

Stress. In general, students are attending college "overwhelmed and more damaged than those of previous years" (Levine & Cureton, 1998b, p. 95). Twenty-eight percent of freshman polled in a national survey reported feeling frequently overwhelmed, and 8% reported feeling depressed (HERI, UCLA, 2000; This Year's Freshmen, 2001). A longitudinal study of psychological distress in college found that although distress levels peaked during the freshman year and then declined for most students, a "subset" of students manifested severe, chronic levels of distress that did not decrease over time (Sher, Wood, & Gotham, 1996). Therefore, the chronic stress of college life may impact how or if a student with a disability decides to engage in exercise behavior. The term, chronic stress, has several definitions within the literature. For this study, chronic stress will be defined as referring to stress that persists "abnormally" or that lasts

for a long time, either because it occurs repeatedly or episodically, continuously, or because it poses severe threats that are difficult to overcome (Baum, Garofalo, & Yali, 1999). This chronic stress suggests that an individual is under constant stressors embedded in living or working environments and to acute-incident stressors that have effects that persist well beyond the initiating event (Baum et al.,1999). Consequently, this data supports that this tenacious stress is associated with poorer health outcomes (Baum et al.,1999). In response to poorer outcomes, decreased exercise behavior may be associated with a decrease in overall health.

Stressful life experiences have been shown to directly correlate with more illness, and recent research has shown a dramatic increase in the levels of stress experienced by college students with or without disabilities throughout the past thirty years (Pritchard, Wilson & Yamnitz, 2007). Unfortunately, as a result of these increasing levels of stress, students often engage in negative health behaviors (e.g., drinking, smoking, unprotected sex) (Pritchard, Wilson, & Yamnitz, 2007).

Physical barriers for PWD and exercise. There are several other barriers that impact an individual's access to exercise behaviors at the college level. For example, according to Nixon (1994,1989), societal attitudes about physical ability often have precluded this group from gaining access into the socially valued arena of sport and physical activity. Likewise, individuals with physical and sensory disabilities have had limited opportunities to participate in and the sport and physical fitness context (Nixon, 1984; Sherrill & Williams,1996).

There may be several reasons for the behavioral disparities between college students with disabilities compared to those without disabilities. According to Agarwal (2011), several students with disabilities encounter structural barriers, such as the lack of ramps or elevators in multi-level school buildings, heavy doors, lack of automatic doors, inaccessible restrooms, and

unobtainable transportation to and from school. As a result of these barriers, accessibility to sports and recreational centers on college campuses is limited for individuals with disabilities. Research has also indicated that stigma and negative attitudes towards people with disabilities contributes to the decrease in exercise behaviors for individuals with disabilities as well.

Healthy People 2010 (USDHSS) indicated that individuals with disabilities were more likely to encounter problematic barriers than the nondisabled population (55% vs. 43%). For example, Rimmer, Riley, Wang, Rauworth, and Jurkowski (2004) implemented a focus group study within ten regions of the United States to identify barriers and facilitators of physical activities among people with disabilities. Focus group participants consisted of people with disabilities, architects, fitness/recreation professionals, city planners and park district managers. The results of this study indicated that factors such as the natural and built environment, economics, emotional and psychological health, equipment suitability, perceptions and attitudes towards disability, and the availability of resources were some of the common themes. As a result of these limitations and barriers for individuals with disabilities, it is even more significant to address how to decrease obstacles for individuals to engage in exercise behavior.

Implementing SCT for exercise behaviors and College Students with Disabilities

Based on this literature review, it is evident that the needs and accommodations for college students with disabilities to engage in exercise behaviors is a concern that calls for attention. It is imperative for rehabilitation counseling professionals to increase informed awareness about these important health issues for individuals with disabilities and to address them in interventions specifically designed to remove barriers to optimal health. SCT is a theoretical foundation that may assist rehabilitation counseling professionals as well as higher education administrators in conceptualizing how to address these targeted concerns within the

disability population. The premise suggested by Bandura to increase self-efficacy and positive outcome expectations while examining goals, facilitators and risks are the assumptions within this framework.

SCT provides a cooperative model utilizing the principles of behavioral determinants, which are categorized into reciprocally influencing characteristics of the person (thoughts), the environment, and the behavior itself (Wallace et al. 2000).

This study further explored the SCT by examining if the predictors of stress, social support, alcohol, college climate, self-efficacy and outcome expectancy are significantly impacting college students with disabilities to engage in exercise behaviors. More importantly, the implications for this research provided valuable information on how to better serve college students with disabilities to increase overall health, including exercise behavior. The significance of exercise behaviors should not be underscored for the general public. This study addressed if college students with disabilities need specific interventions and treatment modalities with removing the physical barriers to foster accessibility, motivation and drive to engage in exercise behavior based on the constructs within the SCT.

Chapter 3

Methodology

Research Design

A quantitative descriptive design (Heppner, Wampold, & Kivlighan, 2008) utilizing hierarchical linear regression and correlational analysis was used to evaluate whether the constructs of SCT predict exercise behaviors for college students with disabilities. Specifically, hierarchical linear regression was applied to determine the exclusive contribution of impediments (stress, alcohol abuse, physical barriers to exercise, depression); facilitators (social support and climate towards disability), exercise self-efficacy, and exercise outcome expectancy. The dependent variable for this study is exercise behavior.

Sampling and Procedure

Descriptive data for the participants in this study are presented in Table 3.1. The age range for participants was 18-47 (M = 24, SD = 7.9). Participants reported the following: 20 male (26.7 %), 53 female (70.7%), one transgender (1.3%), and one person (1.3%) who did not report their gender. There were 53 White/Caucasian (70.7%), five Black/African American (6.7%), three Hispanic/Latino (4%), four Asian (5.3%), seven as two or more races (9.3%), and Other (2.7%). A majority of the participants were single in this study, with 43 (57.3%) single = 43 (57.3%), 20 (26.7%) in a relationship, 10, (13.3%) married, and 1 (1.3%) divorced. A majority of the participants reported either having a learning disability or mental illness as their primary disability. The breakdown follows: Blind or visually impaired = 1 (1.3%), Deaf or hearing impaired = 5 (6.7%), Mobility impairment (e.g. spinal cord injury) = 2 (2.7%), Brain injury = 5 (6.7%), Learning disability or attention deficit hyperactivity disorder = 31 (41.3%), Intellectual disability or cognitive deficit = 1 (1.3%), Psychiatric or mental health (e.g.

depression, anxiety) = 39 (52%), Chronic health condition = 10 (13.3%), Autism Spectrum Disorder= 4 (5.3%), Other = 7 (9.3%).

Table 3.1
Participant Demographic Information and Disability Status (*N= 75*)

Variable	*n (%)*	*Mean*	*SD*
Age		24.92	9.66
Gender			
Male	20 (26.7%)		
Female	53 (70.7%)		
Transgender	1 (1.3%)		
Missing	1 (1.3%)		
Race/Ethnicity			
White	53 (70.7%)		
Black/African American	5 (6.7%)		
Hispanic or Latino	3 (4.0%)		
Asian	4 (5.3%)		
Two or more races	7 (9.3%)		
Other	2 (2.7%)		
Relationship Status			
Single	43 (57.3%)		
In a relationship	20 (26.7%)		
Married	10 (13.3%)		
Divorced	1 (1.3%)		
Disability Type			
Blind or Visually Impaired	1 (1.3%)		
Deaf or Hearing Impaired	5 (6.7%)		
Mobility Impaired	2 (2.7%)		
Brain Injury	5 (6.7%)		
Learning Disability or ADHD	31 (41.3%)		
Intellectual Disability or Cognitive Deficit	1 (1.3%)		
Psychiatric or Mental Health	39 (52%)		
Chronic health condition	10 (13.3%)		
Autism Spectrum Disorder	4 (5.3%)		
Other	7 (9.3%)		

Data for this study was collected from two Universities, the University of Wisconsin-Madison and the University of Wisconsin-Milwaukee. Staff from the McBurney Center at the University of Wisconsin-Madison and staff at the Disability Service Center at the University of Wisconsin-Milwaukee agreed to send an email with a survey link to students who identify as having a disability. The inclusion criteria for the sample of individuals with disabilities are as follows: (a) be an undergraduate or graduate student enrolled full or part-time at the University of Wisconsin-Madison or the University of Wisconsin-Milwaukee (b) identify as having a disability (c) and be 18 years old or older.

The sample size needed to achieve a power was calculated using G-Power software downloaded from the internet. The sample size of 107 was calculated to be adequate for testing a regression model where the constructs were at least moderately correlated and the reliability of the measures was adequate.

Upon permission granted from the dissertation committee, an application to the Institutional Review Board at the University of Wisconsin-Madison was submitted. The IRB offices from UW-Milwaukee and UW-Madison agreed to have the research for both institutions overseen by the UW-Madison IRB. The McBurney Center (Madison) and the Disability Student Center (Milwaukee) were sent an email invitation with a link to the informed consent form and survey. The anonymous online survey was developed and hosted on Qualtrics (www.qualtrics.com). A written consent was not required by the IRB. Continuing to complete the study after reading the informed consent was accepted as consent to participate. The survey was sent out from both Universities in the spring semester of 2015. The survey was once again sent in the fall of 2016 in an attempt to collect more data. Since the analysis was still underpowered, one more attempt was made to collect data at Southern University, Louisiana

State University and Baton Rouge Community College. Unfortunately, these efforts did not result in any additional useable data.

A total of approximately 1900 surveys were sent to students who identified as having a disability at the University of Wisconsin-Madison and the University of Wisconsin-Milwaukee. In the first wave of recruitment, an initial survey was sent to recruit participants along with a follow up survey one week later. The survey was sent only once more in the fall of 2016. Participants completed an online survey of 144 items that took approximately 30 minutes to complete. The survey included a demographic questionnaire as well as brief instruments assessing the variables of stress, social support, health self-efficacy, college climate, alcohol use, general health, and exercise behavior. To encourage response due to the length of the survey and the time it takes to complete, participants were entered in a drawing to win one $150.00 dollar gift card from Amazon.com.

Instruments

A single instrument was used to assess each variable in the model as shown in Table 3.2. The following sections provide a brief description of each instrument proposed for inclusion in this study, including the instruments background, the researcher's justification for its selection, and information describing its psychometric characteristics. Demographics were also collected (e.g. age, race, gender, relationship, disability status) from each participant. In order to answer the research question, the survey asked specific questions applicable to the constructs of SCT in order to examine their prediction on exercise behavior.

Severity of disability. A general assessment of how students endorse overall health was assessed using the World Health Outcomes Disability Assessment Schedule (WHODAS-12) The WHODAS-12 covers six domains: cognition, mobility, self-care, getting along, life activities and

participation. For each of the 12 items of WHODAS-12, respondents have to rate their ability in undertaking the addressed activities with reference to the previous 30 days, with a five-point scale (no difficulty–extreme difficulty). A summary index is available, with scores ranging between 0 and 100; higher scores indicate higher disability.

Impediments

Stress. Stress was examined for this study using the Perceived Stress Scale (PSS-4) developed by Cohen, Kamarck & Mermelstein (1983). The Perceived Stress Scale (PSS) is a self-report questionnaire developed by Cohen et al. (1983) to measure a person's evaluation of stressful situations in the previous 1 month of his or her life. It is a global measure of stress that is simple to use, and there is an abundance of studies confirming its reliability and validity in a variety of settings and in multiple languages (Cohen et al., 1983; Cohen and Williamson, 1988; Mezzacappa et al., 2000; Mimura and Griffiths, 2004; Muller and Spitz, 2003;Warttig, Forshaw, South & White, 2013; Stowell, Kiecolt-Glaser, 2001). The instrument contains 4 statements from the original PSS-10 (items 2, 6, 7 and 14). Respondents rate how often they experience stressful situations on a 5-point Likert scale ranging from 'never' to 'very often'. The higher the score on the PSS, the greater the respondent perceives that their demands exceed their ability to cope. There are no cut-off scores. Instead, an individual's scores is compared to a normative value.

Physical barriers to exercise. This study used the Barriers to Health Promoting Activities for Disabled Persons Scale (BHADP) developed by Becker, Stuifbergen, and Sands (1991) to measure perceptions of barriers to health promotion activities. The BHADP is composed of 18 items making up three subscales: (a) intrapersonal barriers (e.g., too tired), (b) interpersonal barriers (e.g., "other responsibilities") and (c) environmental barriers (e.g., lack of transportation) which ask subjects about different problem types (that might make it difficult for

them to engage in health behavior (Chiu, Lynch, Chan & Rose, 2012). Responses are scored on a Likert scale with 1 (never) to 4 (routinely), scores range from 18-72 with higher scores reflecting more perceived barriers. The BHADP was found to have good internal consistency reliability coefficients ($\propto = .82 - .85$).

Alcohol abuse. To detect lifetime alcohol problems, I used the Short Michigan Alcoholism Screening Test (SMAST) (Selzer et al., 1971), a valid and reliable 13-item scale. Scores range from 0 to 13, with higher scores denoting greater history of alcohol problems. All questions are to be answered with "YES" or "NO" answers only. Scoring: Each "YES" answer equals one (1) point. Interpretations: A score of 1 or 2 indicates that there is no alcohol problem and no further action is needed at this time. A score of 3 indicates a borderline alcohol problem and further investigation is necessary. A score of 4 or more indicates that there may be an alcohol problem.

Depression and anxiety. To measure the levels of anxiety or depression that college students with disabilities are experiencing, the PHQ-4 was used. The Patient Health Questionnaire-4 (PHQ-4) is a 4 item inventory rated on a 4 point Likert-type scale developed by (Kroenke, Spitzer, Williams & Löwe, 2009). The items are drawn from the first two items of the 'Generalized Anxiety Disorder–7 scale' (GAD–7) and the 'Patient Health Questionnaire-8' (PHQ-8). Its purpose is to allow for very brief and accurate measurement of depression and anxiety. The PHQ-4 for depression and anxiety has been validated in large clinical (n=2149) and general population (n=5030) samples (Kroenke et al., 2009).The construct and factorial validity of the two-item depression and two-item anxiety subscales has additionally been confirmed, as was the recommended cut point of ≥3 on each subscale.

Facilitators

Social support for exercise. Social support was measured with the Friend and Family Support for Exercise Habits Scale, used to operationalize social support from friends and family for engaging in physical activity/exercise (Sallis, Grossman, Pinski, Patterson & Nader, 1987). The scale consists of 20 items and 2 subscales: (a) friend support, which has 5 items (e.g., "My friend gave me helpful reminders to exercise") and (b) family support. The family support subscale has 2 factors: participation and involvement, which has 12 items (e.g., "My family member gave me encouragement to stick with my exercise program"), and rewards and punishments, which has 3 items (e.g., "My family member gave me rewards for exercising"). Each item is rated on a 5-point Likert scale ranging from 1 (none) to 5 (very often). Scores on this measure range from 20 to 100, with higher scores reflecting more friend and family support for engaging in physical activity/exercise. Cronbach's alpha has been reported as .84 for the friend support subscale and .91 and .61 for the participation/involvement and rewards/punishments factors of the family support subscale, respectively. Cronbach's alpha coefficient for the scale in the present study was computed to be .94.

Climate towards disability. To measure the climate towards disability for this study, the College Students with Disabilities Campus Climate (CSDCC) developed by Lombardi, Gerdes & Murray (2010) was used. This instrument measures the impact of individual actions and perceptions of postsecondary and social supports on college students with disabilities. It contains 43 items with six response options on a Likert scale ranging from 1 (never true) to 6 (always true). The overall reliability of the CSDCC survey (α =.80) is preferable (Nunnally, 1975) and within subscales ranged from .88 on Peer Support to .58 on Faculty Attempts to Minimize Barriers.

SCT Factors

Exercise self-efficacy. Exercise self-efficacy was measured utilizing the Physical Exercise Self-Efficacy Scale. The PESES is a 10-item instrument with a 4-point Likert-type scale. Scale items elicit beliefs about personal ability to engage in routine physical exercise. Total scores range from 5 to 20. Higher scores represent more confidence in the ability to engage in routine physical exercise, while lower scores represent less confidence in the ability to engage in routine physical exercise. This scale is a valid measure of SEE, the focus of SCT, as it has been significantly and moderately correlated with exercise intention (r = .33) and physical exercise behavior (r = .39) in previous studies. The scale has excellent internal consistency reliability with a Cronbach's alpha of .88 in a sample of Caucasian women (Brown, 2005).

Exercise outcome expectancy. The outcome expectancy of general health will be measured using the Outcome Expectations for Exercise Scale (OEE) developed by (Resnick, Zimmerman, Orwig, Furstenberg, & Magaziner, 2000) to measure the outcome expectations for positive health for college students with disabilities. The OEE has 9 items that focus on the positive expectations of exercise (e.g., "Exercise improves my endurance in performing my daily activities"). A modified version of the items to indicate general health was applied for this study. (e.g., "I expect that exercise will increase my endurance in performing daily activities". The OEE uses a 5 point Likert-type scale 1 (strongly agree) to 5 (strongly disagree). Scores on this measure range from 9 to 45, with higher scores reflecting less outcome expectations for engaging in physical activity/exercise. The internal reliability of this instrument is strong ($\propto$=.89), and the reliability and validity of the scale is psychometrically sound (Resnick et al., 2000).

Dependent Variable

Exercise Behavior. To measure the physical activity for individuals, The Physical Activity Scale for Individuals with Physical Disabilities (PASIPD) was used. PASIPD was developed by Washburn, Zhu, McAuley, Frogley, & Figoni (2002). PASIPD is a well-validated, self-report measure that measures areas of lifestyle physical activity. The PASIPD contains 12 items and five factors: (a) home repair and lawn and garden work, (b) housework, (c) vigorous sport and recreation, (d) light/moderate sport and recreation, and (e) occupation. Respondents are asked to indicate frequency and duration of engagement in each activity. Scores are computed by multiplying the average hours per day of an activity by a metabolic equivalent of task (MET) value, which represents the intensity of physical activities. The scores are summed across all items, and the maximum possible score is 199.5 MET hours per day (MET-hr/d). Test–retest reliability for the PASIPD over a 1-week interval was reported to be .77 (van der Ploeg et al., 2007). Internal consistency coefficients for the five PASIPD factors range from .37 to .59 (Washburn et al., 2002).

Data Analysis

The Statistical Package for Social Sciences (SPSS) was used for data analysis. To test the research hypotheses, data was examined using descriptive statistics and hierarchical linear regression. Preliminary data analysis included a consideration of frequencies, percentages, means, and standard deviations. For this study, the outcome measure of exercise behavior was measured using The Physical Activity Scale for Individuals with Physical Disabilities (PASIPD). The predictor variables were measured using the following instruments: College Students with Disabilities Campus Climate, Barriers to Health Promoting Activities for Disabled Persons, World Health Outcomes Disability Assessment Schedule, Short Michigan Alcoholism Screening

Test, Cage Screening, Patient Health Questionnaire -4, Outcome Expectations for Exercise Scale, Physical Activity Stages of Change Scale, Friend and Family Support for Exercise Habits Scale, Perceived Stress Scale, Physical Exercise Self-Efficacy Scale.

Preliminary screening and Missing Data. Prior to conducting analyses, the researcher conducted a preliminary screening of the data using SPSS. A majority of the measures in this study had less than 5% missing values. A simple imputation method using regression was selected for handling missing data. The imputation method computes estimations based on the values of other related item variables in the same measure to replace missing data. This method is preferred over case deletion, as it will not decrease the sample size or affect the sample representativeness. According to Fox-Wasylyshyn and El-Masri (2005), simple imputation and multiple imputation methods will provide similar results when the missing data are less than 5%. Despite the fact that there is no well-established cut-off percentage for missing data, Schafer (1999) suggests that a missing data rate of 5% or less is considered to be negligible in the interpretation of results.

Hierarchical Regression Analysis

The primary analysis was conducted using hierarchical regression analysis (HRA) to determine the correlation of each predictor set and to determine the unique contribution and predictive ability of each predictor variable to the variance of the criterion variable (exercise behavior). The change in R^2 (ΔR^2) was examined as a measure of the contribution of each predictor set in the model. Four blocks were entered: (1) demographic information; (2) facilitators (social support and climate towards disability (3) impediments (alcohol abuse, stress and physical barriers to exercise, depression) (4) exercise self-efficacy and exercise outcome expectancy. This order of blocks provided a more accurate understanding of the predictive

ability of the constructs within the SCT to predict exercise behavior when controlling for the other predictors in the model. Significance tests for the regression coefficients for each predictor variable was assessed at each block and at the final model to assess unique relationships to the dependent variable (exercise behavior/physical activity).

Table 3.2
Descriptive Statistics for Study Measures (*N=75*)

SCT Variables	Measure	Response Range	M	SD	α[a]
Predictor Variables					
LD vs Other Disability			.200	.402	
MI vs Other Disability			.520	.502	
PA Social Support	Friends and Family Support for Exercise Habits Scale	1-5	1.86	.833	.94
Supportive School Climate	College Students with Disabilities Campus Climate	1-6	1.04	4.42	.75
Perceived Stress	Perceived Stress Scale	1-5	40.08	7.82	-.88
Alcohol Abuse (MAST)	Short Michigan Screening Test	1-2 (Y/N)	.32	.932	.73
Perceived PA barriers	Barriers to Health Promoting Activities for Disabled Persons Scale	1-4	1.93	.424	.80
Depression	Patient Health Questionnaire- 4	1-4	9.61	3.78	.91
PA Outcome Expectancy	Outcome Expectations for Exercise Scale	1-5	2.06	.715	.91
PA Self-Efficacy	Physical Exercise Self- Efficacy Scale	1-6	2.93	.667	.93
Outcome Variable					
Exercise Behavior	The Physical Activity Scale for Individuals with Physical Disabilities		16.59	14.33	.76

Note: Cronbach's alpha.

CHAPTER FOUR

RESULTS

The purpose of the present study was to examine the predictive ability of Bandura's Social Cognitive Theory for exercise behavior for college students with disabilities. Hierarchical regression analysis (HRA) was used to determine the amount of variance in exercise behavior that could be accounted for by four sets of predictors representing (1) demographic information; (2) facilitators (social support and climate towards disability) (3) impediments (alcohol abuse, stress, physical barriers to exercise, depression) (4) exercise/physical activity self-efficacy and exercise/physical activity outcome expectancy.

Research Question: To what extent are the SCT constructs of impediments (e.g. stress, alcohol abuse and physical barriers to exercise), facilitators (e.g. climate towards disability and social support), and health self-efficacy and health outcome expectancy predictive of exercise behaviors for college students with disabilities? For this research question, it was hypothesized that each set of SCT predictors will significantly impact the effect size of the overall regression model.

This chapter explains in depth the results of the statistical analysis used to evaluate the primary research question utilizing hierarchical regression analysis.

Hierarchical Regression Analysis

Hierarchical regression analysis was conducted to answer the research question with exercise behavior/physical activity as the dependent variable and four sets of SCT variables were entered as predictors in the following sequential steps: (1) demographic information; (2) facilitators (social support and climate towards disability) (3) impediments (alcohol abuse, stress, physical barriers to exercise, depression) (4) exercise self-efficacy and exercise outcome

expectancy. A major reason that multiple regression and correlation (MRC) techniques are attractive to researchers is their flexibility. According to Hoyt, Leierer, and Millington (2006), MRC may be used to test hypotheses of linear or curvilinear associations among variables, to examine associations among pairs of variables controlling for potential confounds, and to test complex associations within multiple variables. In hierarchical regression analysis (HRA), predictor variables are entered sequentially in two or more sets, with the groupings and order of entry predetermined by the researcher (Hoyt et al., 2006).

The correlation matrix and the means and standard deviations for all variables are presented in Table 4.1. It can be seen that within the relationships that social support was positively correlated with exercise behavior, $r = .460$, p = < .01; exercise self-efficacy and exercise behavior was positively correlated with $r, = .387, p = < .01$ *and* exercise outcome expectancy was positively correlated with exercise behavior with $r = .431$, $p = < .01$. For all other correlations among variables, please refer to Table 4.1.

Table 4. 1
Correlations, Means, and Standard Deviations for Variables Used in Hierarchical Regression Analyses

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Physical Activity/Exercise Behaviors	____										
2. LD vs other disability	.155	____									
3. MI vs other disability	-.200*	-.520***	___								
4. PA Support	.460***	.329**	-.296**	_____							
5. Supportive School Climate	.267*	.148	-.343**	.261*	_____						
6. Perceived Stress	-.258*	-.241*	.529***	-.445	-.436***	____					
7. Drinking Problem (MAST)	-.157	-.065	.101	-.099	-.319**	.250*	_____				
8. Perceived PA barriers	-.148	-.006	.302**	-.127	-.328**	.404***	.119	_____			
9. Depression	-.190	-.215*	.562***	-.287**	-.474***	.670***	.223*	.317**	_____		
10. PA Outcome Expectancy	.431***	.02	.194*	.239*	.276**	.250*	.201*	.280**	.323**	_____	
11. PA Efficacy	.387***	.176	-.333**	.283**	.398***	-.605***	-.337**	-.553***	-.492***	-.405***	___
	_____										
Mean	16.59	.200	.520	1.86	4.42	40.00	.320	1.93	9.61	2.06	2.93
Standard deviation	14.33	.402	.502	.833	1.04	7.82	.932	.424	3.78	.715	.667

*p < .05, **p < .01, ***p< .001

The results of the analysis, including values of change in R^2 (ΔR^2), along with unstandardized regression coefficients (*B*), standard errors (*SE B*), and standardized coefficients (β) for the predictor variables at each step and in the final mode are presented in Table 4.2. For the hierarchical regression analysis, four blocks were entered to determine what variables predict exercise behaviors for college students with disabilities. It should be noted that there was not a theoretical justification as to why steps were entered in the sequential order of demographics, facilitators, impediments and then outcome expectancy, self-efficacy. The researcher used the guidelines based on the SCT constructs to analyze the data.

The first block (demographics) was entered as a predictor variable for the analysis. The variables of race/ethnicity, marital status, and age were not entered into the HRA analysis due to the homogeneous sample population on these demographics who were primarily white, single, and in their late teens or early twenties. Disability was collapsed into the following categories for analysis: Learning disability (LD) versus other disabilities and Mental Illness (MI) vs. other disabilities. Other disabilities included: intellectual disabilities (N= 1), chronic health conditions (N=17), mobility impairments (N= 2), traumatic brain injuries (N =5), visually impaired (N =1), hearing impaired (N =5). The two variables that were by far the most common were students with learning disabilities or mental illness. These variables were dummy coded to learning disability (LD) versus other disability, and mental illness (MI) versus other disability for the data analysis.

For first step of the regression analysis, demographic variables (learning disability vs other disability, and mental illness vs other disability) were entered. This step in the analysis was not significant ($R = .209$, $R^2 = .044$, $F\ (2,\ 72) = .202$, $p > .05$). Disability status explained 4% of

the variance in exercise behavior. Examining the standardized partial regression coefficients, neither learning disability (β = .07, t (74) = .52, p = .60) nor mental illness (β = -.163, t (74) = -1.20, p = .231) were found to significantly contribute to the change in variance in exercise behavior. This result indicates both learning disability and mental illness were not significant contributors to the variance in the model.

The second steps of variables were entered as facilitators to exercise behaviors (supportive school climate, physical activity/ exercise behavior social support). This set of variables was statistically significant when added to the model (R = .486, R^2 = .236, ΔR^2 = .192, F (2, 70) = .000, p <.001). Exercise behavior for college students was highly correlated with both social support and school climate. Examining the standardized partial regression coefficients, social support was found to significantly contribute to the change in variance in exercise behavior (β = .418, t (74) = 3.66, p < .001), indicating that higher levels of social support correlated with increased exercise behaviors for college students with disabilities. Supportive school climate was not found to significantly contribute to the change in variance in exercise behavior (β = -.148, t (74) = 1.30, p = .195).

For the third step of this analysis, the impediment variables (perceived stress, drinking problem, perceived physical activities barriers, and depression) were entered. The addition of these specific variables did not account for a significant increase in variance of exercise behavior beyond that explained by the previous sets of predictors, R = .493, R, = .243, ΔR^2 = .007, F (4,66) = .956. When examining the standardized coefficients, perceived stress was not found to significantly contribute to the model (β = .027, t (74) = .162, p = .872), drinking problem was not found to significantly contribute to the model (β = -.078, t (74) = -.681, p = .498, , perceived physical activity barriers was also not found to significantly contribute to the model (β = -.048, t

(74) = -.394, p = .695), and depression was not found to significantly contribute to the model (β = .032, t (74) = .200, p = .842). In summary, no exercise impediment factors contributed to the model.

The final step of this analysis, the variables of outcome expectancy and physical activity efficacy contributed to the overall model significantly. The addition of these two variables accounted for a significant amount of additional variance in exercise behavior scores beyond that explained by the other social cognitive variables entered in previous steps, R = .612, R^2 = .375, Δ R^2= .002, F (2, 6.72) = .002, p = <.01. When examining the standardized partial coefficients, outcome expectancy significantly contributed to the variance in the model (β = .283, t (74) = .2.50, p = .015). This indicates that higher levels of outcome expectancy for exercise behaviors related with an increase in college students with disabilities engaging in exercise behavior. Physical activity self-efficacy also significantly contributed to the overall model (β = .300, t (74), = 2.01, p = .048. This final block resulted in contributing to the overall model the most in comparison to the other previous blocks entered.

The final regression model accounted for 38% of the variance in predicting exercise behavior for college students with disabilities and is considered a large effect size (Cohen, 1988). Controlling for all other factors, social support, outcome expectancy and self-efficacy were significant predictors of college students with disabilities exercise behaviors.

Table 4.2

Hierarchical Regression Analysis for Prediction of Exercise Behavior (N = 75)

			At Entry Into Model			Final Model		
Variable	R^2	ΔR^2	B	*SE B*	β	B	SE B	β
Step1	.044	.044						
Learning Disability vs other			2.50	4.80	.07	-.978	4.40	-.027
MI vs Other			-.4.65	3.84	-.163	-2.31	4.12	-.081
Step2	.236	.192***						
Social Support			7.18	1.96	.418	6.25	2.01	.364
College Climate			2.04	1.55	.148	1.34	1.65	.097
Step3	.243	.007						
Perceived Stress			.049	.302	.027	.171	.296	.093
Drinking Problem			-1.19	1.76	-.078	.104	1.67	.007
Perceived PA Barriers			-1.62	4.11	-.048	3.97	4.23	.118
Depression			.120	.601	.032	.522	.566	.138
Step4	.375	.131**						
PA Outcome Expectancy			5.66	2.26	.283	5.66	2.26	.283
PA Efficacy			6.43	3.19	.300	6.43	3.19	.300

Notes. F (10, 64) = 3.835, p < 001 for the full model*; F (*2, 72*) =*1.638 for Step 1*; F (*2, 70*)=* 8.807*, p< .001* for Step 2*; F (*4,66*) =*.163,n.s. for Step 3*; F (2, 64) =6.725 , p < .01* for Step 4.

*p < .05, **p < .01, ***p< .001

Table 4.3

Hierarchical Regression Analysis Instrument Descriptive (N=75)

Steps	Title	Instrument
Block 1	**Demographics**	
	Learning Disability vs Other	World Health Outcomes Disability
	Mental Illness vs Other	Assessment Schedule-12
Block 2	**Facilitators**	
	Social Support	Friends and Family Support for Exercise Habits Scale
	College Climate	College Students with Disabilities Campus Climate
Block 3	**Impediments**	
	Perceived Stress	Perceived Stress Scale
	Alcohol Abuse	Short Michigan Screening Test
	Perceived PA Barriers	Barriers to Health Promoting Activities for Disabled Persons Scale
	Depression	Patient Health Questionnaire-4
Block 4	**STC Variables**	
	PA Outcome Expectancy	Outcome Expectations for Exercise Scale
	PA Self-Efficacy	Physical Exercise Self-Efficacy Scale

CHAPTER FIVE

SUMMARY, DISCUSSION, AND IMPLICATIONS

Health is significant for people with or without disabilities, and health promotion efforts often do not focus on the needs of people with disabilities or address these unique aspects when preventative measures to secondary conditions are being implemented in society (WHO, 2011). Participation in large amounts of sedentary behaviors is associated with multiple health problems such as impaired lipid profiles and glucose uptake, greater energy intake and waist circumferences, and greater mortality risk (Williams, Raynor, Ciccolo, 2008; King et al., 2010; Dunstan et al., 2008). A significant majority of college students' physical activity patterns are not at optimal levels and tend to deteriorate over time (Small, Bailey-Davis, Morgan, & Maggs, 2012). Often, the transition into the workforce from college may involve college students developing more sedentary behaviors as a result of job duties. It is important to take preventative measures that address how to increase physical activity during this transition.

This study examined the SCT theory as a model for exercise behaviors for college students with disabilities. The purpose of this study was to examine whether constructs embedded in Bandura's social cognitive theory (SCT) predict exercise behavior for college students with disabilities. The initial phase of this study was the primary analysis evaluation whether the SCT constructs in the predicted physical activity/exercise behavior in college students with disabilities. Results provide partial support the SCT framework for predicting exercise behavior, with the overall regression model accounted for 38% of the variance in physical activity/exercise participation for college students with disabilities. As expected, social support for physical activity, exercise self-efficacy, and exercise outcome expectancy were positively correlated to the outcome of exercise behavior. Results support the SCT framework as

a viable model to focus on the certain needs for college students with disabilities to increase exercise behaviors which may decrease secondary conditions. The results of this study partially supported the hypothesis that all predictors within the SCT framework would significantly contribute to predicting the outcome of exercise behavior. A summary and analysis of the results of this study are provided in the next sections in addition to a discussion of the limitations of this study, clinical implications, research implications, and future research.

Summary of Findings

A correlational analysis was conducted to evaluate the relationships between the eleven predictors and one outcome variable from the Bandura SCT model. There were several significant relationships found. For example, there were various large positive relationships between the following variables: depression and perceived stress; self-efficacy and perceived stress; physical activity barriers and self-efficacy; and, social support and exercise behaviors. Some medium correlations were also observed between: social support and perceived stress; supportive school climate and exercise behaviors; and learning disability and social support There were some smaller correlations among perceived physical activity barriers, and drinking problems in relationship to the dependent variable, exercise behavior.

For the hierarchical regression analysis, four blocks were entered to determine what variables predict exercise behaviors for college students with disabilities. The first block (disability type) was entered for the HRA analysis, with variables learning disability (LD) versus other disability, and Mental illness (MI) versus other disability for the data analysis. This first block of variables explained 4% of the variance in the model and did not significantly contribute to predicting physical activity. The second block entered constituted facilitators of exercise behavior and included the variables of social support and college campus climate. These

variables accounted for a 19% increase in the variance explained by the model after this block was entered, with only social support being a significant predictor of PA at this stage of the model. The third block of variables, impediments to exercise behavior (alcohol use, stress, depression and physical barriers), accounted for no significant improvement in the overall model, and social support remained the only significant predictor of exercise behavior. In the fourth and final block, the predictors of exercise self-efficacy and exercise outcome expectancy were entered. These additions accounted for a 13% increase to the variance explained when added to the overall model. The final regression model accounted for accounted for $R^2 = 38\%$ of the variance in exercise behavior, which is a large effect size (Cohen, 1988, 1992). The three variables that significantly predicted exercise behavior in the final model were social support, self-efficacy, and outcome expectancies for this behavior.

An analysis of the results of this study are provided in the next section in addition to a discussion of the limitations of this study, clinical implications, research implications, future research.

Discussion

This study examined the SCT theory as a model for exercise behavior for college students with disabilities. The initial phase of this study was the evaluation of whether the constructs in SCT predicted physical activity/exercise behavior in college students with disabilities. This study provides support for the SCT framework. The overall regression model accounted for 38% of the variance in physical activity/exercise participation for college students with disabilities. As expected, social support for physical activity, exercise self-efficacy, and exercise outcome expectancy were positively correlated to the outcome of exercise behavior.

Results support the SCT framework as a viable model for health promotion efforts and for predicting exercise behaviors for college students with disabilities. An analysis of the results of this study are provided in the next section in addition to a discussion of the limitations of this study, college setting implications, research implications, and future research. Overall, the results of this study were as expected based on the research question and hypothesis. However, the impediment factors (drinking problem, perceived physical activity barriers, depression and perceived stress) did not significantly influence the outcome, exercise behavior which was not as expected. Within the block of impediments, stress was the only variable that was related to exercise behavior at the zero order correlation. However, entry of the social support and supportive school climate resulted in stress no longer being a significant predictor of exercise behavior. This speaks to the importance of social support for exercise and its ability to ameliorate the risk of stress on exercise behavior.

Within the rehabilitation literature, there has been evidence supporting variations of the SCT constructs when predicting exercise behavior for the general population. This research may also include college students with disabilities. A vast amount of literature suggests that social support is positively correlated to exercise behavior within the general college student population. For example, college students typically have a more immediate social support group involving peers from home as well as from educational settings (Gruber, 2008). In fact, research suggests that the ideas and views of immediate friends are more powerful motivators to weight loss and exercise within the college student population (Okun, Karloy, & Lutz, 2002; Prochaska, Rodgers, & Sallis, 2002). However, other research has supported that the physical barriers to exercise, alcohol use, stress and depression may also contribute to individuals to engage in exercise behavior. For example, undergraduate students who reported high levels of stress were

less likely to exercise, less likely to consume fruits and vegetables, and more inclined to consume soft drinks (Hudd et al., 2000; Lust et al., 2010; Wichianson, Bughi, Unger, Spruijt-Metz, & Nguyen-Rodriguez, 2009). The results of this study indicate that stress is related to exercise behavior for college students with disabilities. The other variables within the block of impediments (depression, alcohol use and PA physical barriers) may not have been significant due to lower sample size, university resources, or the fact that supports were serving as a buffer to the impediments.

Research supports that social support is important for overall well- being, including physical health. At a general level, it has been documented that a lack of positive social relationships leads to negative psychological states such as anxiety or depression. Consequently, these psychological states may ultimately influence physical health, perhaps, exercise behavior, either through a direct effect on physiological processes that influence susceptibility to disease or through behavioral patterns that increase risk for disease and mortality (Cohen & Wills, 1985).

Furthermore, Bandura (1977) postulated that behavioral change is more likely to occur when expectations of both self-efficacy and outcome expectancy are altered simultaneously (Lee, 1984). Literature within the last decade has recognized that short-term studies suggest that interventions which teach goal setting, planning, self-monitoring and self-reward skills can increase exercise adherence (Petoska, Suminski, & Hortz, 2003). Furthermore, the belief in health and social benefits of exercise is a commonly reported outcome expectancy for engaging in physical activity.

Implications for College Settings

The promising results of this study provide support for using the social cognitive theory as a framework to assist college students with disabilities to engage in exercise behavior. The

significant amount of health promotion research targets populations who do not have a disability, and researchers often use a 'preexisting condition' or disability as one of its exclusion criteria, thus limiting the generalizability of health promotion findings for individuals with disabilities (Tomlinson et al., 2009). Because college students are faced with a new set of challenges, including developmental, environmental, and social transitions, and are developing established lifestyle habits, they represent an important target group for health education and health prevention efforts (Cousin au, Goldstein, & Franko, 2004). This study provides mechanisms for increasing exercise behavior. It will be important to evaluate specific modalities, interventions and health promotion efforts that may increasing social support, self-efficacy, and outcome expectancies for college students with disabilities based on the results of this study. Specifically, college settings may find it beneficial to develop walking groups and group fitness classes for individuals with disabilities to foster a positive health environment. Also, developing a range of physical activities available to individuals with disabilities allows for the development and encouragement of personal interests while reinforcing social interaction and participation (Nankervis et al., 2006).

According to Keating, Guan, Piñero, and Bridges (2004), higher education is one of the fundamental environments in which health care professionals and college personnel can implement strategies to help combat sedentary lifestyles by fostering physically active (PA) for college students. Additionally, the authors suggest that higher education professionals should develop and implement new campuses or remodel old campuses to promote physical activity which may include: (1) changing current policies on the use of student fitness centers and intramural sports programs to provide students with opportunities for PA engagement, (2) changing physical education requirements to better educate students regarding the need for

regular PA, and (3) providing extra health and fitness services, such as annual health and fitness appraisals and regular Internet PA monitoring to help students establish habitual PA patterns. To this end, these specific strategies can be implemented and focused on the needs of college students with or without disabilities.

Rimmer et al., (2010) recommended that researchers develop exercise interventions that address specific disability groups and use variations in dose (i.e., intensity, frequency, duration, and type) to prevent or reduce the onset or occurrence of certain secondary conditions (e.g., weight gain, depression, pain, and fatigue) prominent in many individuals with physical and cognitive disabilities. Current literature suggests that the lack of specificity or replication of physical activity/exercise trials pertaining to the frequency, intensity, duration, and modality components of an exercise prescription for individuals with a specific disability has limited their potential use in clinical and community practice, which includes the college setting.

College to Work Transition

Individuals with disabilities are entering higher educational institutions at a growing rate. Recently, the United States Congress passed the Workforce Innovation and Opportunity Act (WIOA) mandated state vocational rehabilitation (VR) agencies to increase effort and resources for working collaboratively with high schools to provide transition services to all students with disabilities (Biden, 2014). This law supports the belief that the employment of young adults with disabilities has increasingly become a vital special education and vocational rehabilitation outcome (Carter, Austin, & Trainor, 2011; Certo et al., 2008; Landmark, Ju, & Zhang, 2010). Because college students are faced with a new set of challenges, including developmental, environmental, and social transitions, and are developing established lifestyle habits, they represent an important target group for nutrition education and prevention efforts.

The results of this study may assist health care professionals and rehabilitation counselors to promote a lifestyle during the college years that highlights physical activity, decreases sedentary behaviors, and provides social support for health activities. According to Bandura, health habits are rooted in familial practices by building self-efficacy. However, Bandura postulated that schools have an important role to play in promoting the health of an individual as well. The educational environment is a natural setting for promoting healthful eating and exercise habits, discouraging smoking and other types of substance abuse, and building generic self-management skills (Bandura, 2004).

According to Keating et. al, (2005), the primary step in the process of increasing physical activity and exercise behavior levels for college students is to gain knowledge about college students' physical activity patterns and key physical activity determinants, including self-efficacy. Furthermore, previous research with college populations has supported high self-efficacy resulting in high physical activity participation levels and an increased likelihood of continuing physical activity (Sullum, Clark, & King, 2000).Therefore, the results of this study support previous research that shows SCT assisting college students with disabilities engaging in exercise behaviors and developing positive health choices. One overarching goal based on this study is to offer wellness programs and fitness facilities that are of universal design which would include students with disabilities to have equal access and opportunity to engage in increasing exercise behavior during the college years.

Implications for Research

The limited sample size prevented the use of more statistically advanced methodologies, such as path analysis or structural equation modeling. A comparative analysis between data collected from this current study and data collected from a different university with a more

diverse population may provide significant information regarding the predictors utilized for this study. Additionally, as a result of the survey being conducted at two Midwestern Universities, in which the student body is comprised of students of a majority Caucasian population, cultural differences were not taken into account. For future studies, this health promotion model may be an opportunity to include an analysis between college students with disabilities with various racial and ethnic backgrounds from more diverse college settings to determine if these demographics contribute to predicting exercise behaviors.

Overall, this study warrants that future studies are needed to better understand various factors that serve as motivation and predict exercise behavior success among college students with disabilities. Also, it would be advantageous for researchers in the health care profession to provide specific operational definitions within the rehabilitation literature of how to define and measure exercise behavior versus physical activity in order to decrease the overlapping of these two health terms.

Additionally, exercise studies focused on people with disabilities shows that risk assessment can be an important predictive variable when examining exercise behavior. For example, a belief that not exercising would result in early death or long term chronic illness may influence an individual to engage in exercise behavior. Risk assessment within the Health Action Process Model (HAPA) integrates the components of the SCT variables. Within the HAPA framework, action self-efficacy, outcome expectancies, and risk perception contribute to intention formation in the motivation phase (Chui et al., 2012). Future research may consider including the addition of risk perceptions, fear appraisal and threat appraisal to improve the predictability of the SCT model for college students with disabilities.

A study conducted by VanBergeijk, Klin, and Volkmar (2008), addressed the psychosocial needs for college students on the autism spectrum. Specifically, the researchers suggest that universities will have to learn how to effectively intervene in the areas of communication, social, and executive functioning by developing interventions to include social skills groups, psychoeducational groups, directive counseling, vocational training, and life coaching in order to help accommodate students on the spectrum (VanBergeijk et al., 2008). Another study by Kinne, Patrick & Maher (1998) examined exercise social support for individuals with mobility impairments. The results indicated long-term exercise for people with mobility impairments may be promoted by efforts to increase motivation to exercise, involving health professionals as a mean of support. As such, the results of the current study may be used as preliminary data to further research the components of the SCT in predicting exercise behavior targeting to college students with disabilities.

More research such as this is needed regarding wellness programs that focuses on exercise behavior with an increase in social support for college students with disabilities is an area of intervention research that is needed. This type of intervention is also appealing for students who face reservations or challenges in perceived stigma based on their disability when engaging in exercise behavior activities. Furthermore, limited studies have been conducted regarding self-efficacy, social support and outcome expectancy on college students with disabilities engaging in exercise behaviors. This study has provided valuable information that will add to the current body of knowledge about college students and health promotion.

An additional area of focus moving forward in health promotion efforts is the application of grant funding to support health and exercise behavior for individuals with disabilities, including the college population. Rehabilitation professionals can apply for federal funding in

order to financially support the tools necessary to implement structured programs to increase exercise behavior for college students with disabilities. More evidence based practice as well as hands on application in college settings will provide significant data to increase health promoting behaviors.

For example, the GRAID framework has been used to adapt the U.S. Centers for Disease Control and Prevention's (CDC) obesity prevention strategies for individuals with physical and developmental disabilities. The development of inclusion guidelines, recommendations and adaptations for obesity prevention (referred to as GRAIDs – Guidelines, Recommendations, Adaptations Including Disability) is comprised of five components: (a) a scoping review of the published and grey literature; (b) an expert workgroup composed of nationally recognized leaders in disability and health promotion who review, discuss and modify the scoping review materials and develop the content into draft GRAIDs; (c) focus groups with individuals with disabilities and their family members (conducted separately) who provide input on the potential applicability of the proposed GRAIDs in real world settings; (d) a national consensus meeting with 21 expert panel members who review and vote on a final set of GRAIDs; and (e) an independent peer review of GRAIDs by national leaders from key disability organizations and professional groups through an online web portal.

The GRAID framework promotes the inclusion of people with disabilities in current and future health promotion research and programs and is a significant step in establishing community integration and health promotion recognizing the needs of people with disabilities (Rimmer, 2011). Adopting the GRAID model in combination with the principles of the social cognitive theory would meet this strategic plan for research and development efforts in assisting college students with disabilities. Rehabilitation counseling educators, public policy officials,

and college administers have a social responsibility to promote equality for all individuals, including those with disabilities. As a result, a multidimensional approach integrating a theoretical framework such as SCT and a public policy orientation such as GRAID, focusing on health promotion efforts including increasing exercise behaviors in college settings, may be a direction to take to achieve better positive health outcomes for college students with disabilities.

Limitations

Any interpretation of the results of this study should consider the following limitations. First, the study format was an anonymous self-report survey, which may provide data that is somewhat biased. Secondly, due to the study's recruitment method, a convenience sample was used in that the participants were college students with disabilities derived from only two mid-western universities. As a result, convenience sampling may limit the generalizability of the results. Third, the survey was comprised of 144 questions which may have caused fatigue for students completing this survey. Students may also have been overwhelmed by the number of surveys that they are receiving, and may have been burnt out from survey completion which may affect their responses. It is plausible that the physical associated with the disability may have impacted an individual's ability to respond to survey items. Fourth, the self-report survey may result in data that is somewhat biased. Students may submit answers that are closer to how they would like remember things or how they would like to be, instead of answers that accurately represent their exercise behavior. Also, due to the timing of when the survey was completed, students may have been less engaged in exercise behaviors due to stress at school. Lastly, students may or may not answer honestly regarding their alcohol intake or use because they are concerned about the consequences of underage drinking. It is important to note that, based on an a priori analysis, the study was not sufficiently powered. It is possible that some of the non-

significant variables (e.g., disability type) might actually predict exercise behavior. The small sample also limited the demographic and other variables that could be included in the regression model.

Conclusion

The findings of this study support the partial application the SCT as a framework for predicting exercise behaviors for college students with disabilities. This specific study resulted in the SCT model accounts for (38%) of the variance in physical activity/exercise behavior scores. The most significant variables for predicting physical activity for individuals with disabilities were social support, self-efficacy, and outcome expectancy. It would be recommended to utilize the SCT as a framework to develop effective physical activity modalities to address the unique needs of individuals with disabilities in the college setting. Furthermore, by focusing on the factors of self-efficacy, outcome expectancy and social support, rehabilitation counselors and college administrators can take a multidimensional approach to implement change within the college setting with a health promotion focus.

Diet quality is also an important determinant of morbidity, mortality, and quality of life among older adults and the aging population (Brownie, 2006). According to Katz and Meller (2014), diet and nutrition are recognized as primary influences on health in modern societies, such as the United States. The authors suggest that an unhealthy diet in combination with has been correlated as the leading cause of premature death and chronic disease. On the contrary, a healthy diet is associated with increased life expectancy, tremendous reduction in lifetime risks of several chronic diseases, and improvement of gene expression. Therefore, the positive view is that diet and exercise behavior are both behaviors that an individual can have control over by taking preventative measures. Regarding future directions and the expansion of health promotion

efforts, diet would be an area that warrants future research and examination due to its effect on overall health.

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Education and Social/Behavioral Science IRB
5/28/2015

Submission ID number:	2015-0495
Title:	Social Cognitive Theory to Predict Health Behaviors for College Students with Disabilities: A Hierarchical Linear Regression Analysis
Principal Investigator:	BRIAN N PHILLIPS
Point-of-contact:	MICHELE M MAHR
IRB Staff Reviewer:	KAMIE LECLAIR

A designated ED/SBS IRB member conducted an expedited review of the above referenced initial application. The study was approved by the IRB member for the period of 12 months with the expiration date of 5/27/2016 . The study qualified for expedited review pursuant to 45 CFR 46.110 and, if applicable, 21 CFR 56.110 and 38 CFR 16.110 in that the study presents no more than minimal risk and involves:

Category 7: Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, or quality assurance methodologies

To access the materials approved by the IRB, including any stamped consent forms, recruitment materials and the approved protocol, if applicable, please log in to your ARROW account and view the documents tab in the submission's workspace.

If you requested a HIPAA waiver of authorization, altered authorization and/or partial authorization, please log in to your ARROW account and view the history tab in the submission's workspace for approval details.

Prior to starting research activities, please review the Investigator Responsibilities guidance (http://go.wisc.edu/m0lovn) which includes a description of IRB requirements for submitting continuing review progress reports, changes of protocol and reportable events.
Please contact the appropriate IRB office with general questions: Health Sciences IRBs at 608-263-2362 or Education and Social/Behavioral Science IRB at 608-263-2320. For questions related to this submission, contact the assigned staff reviewer.

Study Information Sheet

Principal Investigator: Brian Phillips (phone: 608-263-6279) email: blnphillips@wisc.edu)
Co Principal Investigator: Michele Marjorie Mahr (phone: 608-213-1125) email: mmmahr@wisc.edu

Description of the Research: You are invited to participate in a research study about exercise behavior for college students. You are able to participate if you are 18 years of age or older and are enrolled in college. The purpose of this research is to learn more about factors that relate to exercise behavior for college students with disabilities.

What will my participation involve? If you decide to participate in this research, you will be asked to complete this survey. Your participation will last approximately 20-30 minutes.

Are there any risks to me? Your participation in this study is of minimal risk to you. One of the potential risks in this type of study may be a breach of confidentiality. To minimize that risk to you, no identifying information will be collected in the survey; thus, the survey is completely anonymous. After all surveys are collected, each survey will be assigned a numerical number and stored in the researcher's locked office. All surveys will be analyzed and the results will be aggregated (summed) to show group level patterns and not individual patterns. After 5 years, all surveys will be shredded.

Are there any benefits to me? There are no direct benefits to you for participating in this study. The primary benefit of the study is that the information obtained can be used by health and rehabilitation professionals to increase exercise behavior for college students with or without disabilities.

Compensation: Those participants who complete the survey will have the option of being entered into a drawing for one $150.00 Amazon.com gift card at the conclusion of the data collection.

How will my confidentiality be protected? This study is anonymous. Neither your name nor any other identifiable information will be collected.

Whom should I contact if I have questions?: You may ask any questions about the research at any time. If you have questions about the research, you should contact the Principal Investigator Brian Phillips, Ph.D. at (608)-263-6279 or call the student researcher, Michele Mahr, M.S. at (608)-213-1125. If you are not satisfied with the response of the research team, have more questions, or want to talk with someone about your rights as a research participant, you should contact the Health Sciences Institutional Review Board at (608)-263-2362. Your participation is completely voluntary and anonymous. If you decide not to participate or to withdraw from the study, it will have no effect on any services or treatment you are

currently receiving. However, completing all of the survey is in implicit acknowledgement of your consent.

Receipt of your completed survey will indicate that you consent to participate in this study. Thank you for your time and help in conducting this study.

What is your age? (example answer : 21)

What is your gender?

- ☐ Male
- ☐ Female
- ☐ Transgender

What is your race or ethnicity?

- ☐ White/Caucasian
- ☐ Black/African American
- ☐ Hispanic or Latino
- ☐ Asian
- ☐ American Indian or Alaskan Native
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ Two or more races
- ☐ Other (please specify) _____

What kind of chronic illness or disability do you have? (select all that apply)

- ☐ Blind or visually impaired
- ☐ Deaf or hearing impaired
- ☐ Mobility Impaired (e.g. spinal cord injury)

- ☐ Brain Injury
- ☐ Learning Disability or Attention Deficit Hyperactivity Disorder
- ☐ Intellectual Disability or Cognitive Deficit
- ☐ Psychiatric or mental health (e.g. depression, anxiety)
- ☐ Chronic Health Concerns (e.g. Lupus)
- ☐ Autism Spectrum Disorder (e.g. Asperger's)
- ☐ Other (please specify) _____

What is your relationship status? (select the option that best fits you)

- ☐ Single
- ☐ In a relationship
- ☐ Married
- ☐ Divorced
- ☐ Other _____

The next set of questions are about your perceptions of the university/college where you attend. Please respond to each question.

	Never true	Almost never true	Sometimes True	Often True	Almost Always True	Always True
I wish I attended a different University.	☐	☐	☐	☐	☐	☐
I feel comfortable on this campus.	☐	☐	☐	☐	☐	☐
I feel the overall campus environment is supportive of students with disabilities.	☐	☐	☐	☐	☐	☐

People sometimes have problems doing what they need to do to stay healthy. How often do the following things affect your ability to exercise and be physically active?

	Never	Sometimes	Often	Very Often
Lack of convenient facilities	☐	☐	☐	☐

	Never	Sometimes	Often	Very Often
Too tired	☐	☐	☐	☐
Lack of transportation	☐	☐	☐	☐
Feeling what I do doesn't help	☐	☐	☐	☐
Lack of money	☐	☐	☐	☐
Impairment	☐	☐	☐	☐
No one to help me	☐	☐	☐	☐
Not interested	☐	☐	☐	☐
Lack of information	☐	☐	☐	☐
Embarrassment about my appearance	☐	☐	☐	☐
Concerns about safety	☐	☐	☐	☐
Lack of support from family/friends	☐	☐	☐	☐
Interferes with other responsibilities	☐	☐	☐	☐
Lack of time	☐	☐	☐	☐
Feeling I can't do things correctly	☐	☐	☐	☐
Difficulty with communication	☐	☐	☐	☐
Bad weather	☐	☐	☐	☐
Lack of help from health care professionals	☐	☐	☐	☐

These questions are about difficulties due to health conditions. Think back over <u>the last 30 days</u>, and answer these questions based on <u>how much trouble you had with the following activities</u>.

	None	Mild	Moderate	Severe	Extreme or Cannot Do
Standing for long periods such as 30 minutes?	☐	☐	☐	☐	☐
Taking care of your household responsibilities?	☐	☐	☐	☐	☐
Learning a new task, for example how to get to a new place?	☐	☐	☐	☐	☐
How much of a problem did you have in joining community activities (for example, festivities, religious or other activities) in the same way that anyone else can?	☐	☐	☐	☐	☐
How much have you been emotionally affected by your health problems?	☐	☐	☐	☐	☐
Concentrating on doing something for ten minutes?	☐	☐	☐	☐	☐
Walking a long distance such as a kilometer (or equivalent)?	☐	☐	☐	☐	☐
Washing your whole body?	☐	☐	☐	☐	☐
Getting dressed?	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

	None	Mild	Moderate	Severe	Extreme or Cannot Do
Dealing with people you do not know?					
Maintaining a friendship?	☐	☐	☐	☐	☐
Your day to day work?	☐	☐	☐	☐	☐

In answering the following questions:

VIGOROUS physical activities refer to activities that take hard physical effort and make you breathe much harder than normal.
MODERATE activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal.

During the last 7 days, on how many days did you do **vigorous** physical activities or activities like heavy lifting, digging, aerobics, or fast bicycling? (Think about only those physical activities that you did for at least 10 minutes at a time.)

How much time in total did you usually spend on one of those days doing vigorous physical activities? (answer in hours and minutes)

Hours
Minutes

During the last 7 days, on how many days did you do **moderate** physical activities like carry light loads, bicycling at a regular pace, or doubles tennis? **Do not include walking.** (Again, think about only those physical activities that you did for at least 10 minutes at a time.)

How much time in total did you usually spend on one of those days doing moderate physical activities? (answer in hours and minutes)

Hours
Minutes

During the last 7 days, on how many days did you **walk or wheel around in your wheelchair** for at least 10 minutes at a time? This includes at work and at home, to travel from place to place, and any other walking or wheeling that you did solely for recreation, sport, exercise or leisure.

How much time in total did you usually spend on one of those days walking or wheeling your chair? (answer in hours and minutes)

Hours
Minutes

This question is about the time you spent sitting *inactively* on weekdays while at work, at home, while doing course work and during leisure time. This includes time spent sitting at a desk, visiting friends, reading, traveling on a bus, or sitting/lying down to watch TV.

During the last 7 days, how much time in total did you usually spend sitting inactively on a weekday? (answer in hours and minutes)

Hours
Minutes

	YES	NO
Have you ever felt you ought to cut down on your drinking?	☐	☐
Have people annoyed you by criticizing your drinking?	☐	☐
Have you ever felt bad or guilty about your drinking?	☐	☐
Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover (eye-opener)?	☐	☐
Do you feel you are a normal drinker?	☐	☐
Do friends or relatives think you are a normal drinker?	☐	☐
Have you ever attended a meeting of Alcoholics Anonymous?	☐	☐
Have you ever lost friends or boy/girlfriends because of drinking?	☐	☐
Have you ever gotten into trouble at work because of drinking?	☐	☐

Have you ever neglected your obligations, your family, or your work for two or more days in a row because you were drinking?	☐	☐
Have you ever had delirium tremens (DTs), severe shaking, heard voices, seen things that weren't there after heavy drinking?	☐	☐
Have you ever gone to anyone for help because of your drinking?	☐	☐
Have you ever been in a hospital because of drinking?	☐	☐
Have you ever been arrested for drunk driving or driving after drinking?	☐	☐

Over the last 2 weeks, how often have you been bothered by the following problems?

	Not at all	Several Days	More than half the days	Nearly every day
Feeling nervous, anxious or on edge?	☐	☐	☐	☐
Not being able to stop or control worrying	☐	☐	☐	☐
Little interest or pleasure in doing things	☐	☐	☐	☐
Feeling down, depressed, or hopeless	☐	☐	☐	☐

Please rate the following statements regarding your expectations about physical activity and exercise.

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Physical activity and exercise makes me feel better physically.	☐	☐	☐	☐	☐
Physical activity and exercise makes my mood better in general.	☐	☐	☐	☐	☐
Physical activity and exercise help me feel less tired.	☐	☐	☐	☐	☐
Physical activity and exercise make my muscles stronger.	☐	☐	☐	☐	☐
Physical activity and exercise is an activity I enjoy doing.	☐	☐	☐	☐	☐
Physical activity and exercise give me a sense of personal accomplishment.	☐	☐	☐	☐	☐
Physical activity and exercise makes me more alert mentally.	☐	☐	☐	☐	☐
Physical activity and exercise improves my endurance in performing my daily activities.	☐	☐	☐	☐	☐
Physical activity and exercise helps to strengthen my bones.	☐	☐	☐	☐	☐

Please answer the following questions regarding whether or not you engage in regular physical activity such as walking, gardening, or housework.

	Yes	No
Do you currently engage in regular physical activity?	☐	☐
Do you intend to engage in regular physical activity in the next 6 months?	☐	☐
Do you intend to engage in regular physical activity in the next 30 days?	☐	☐
Have you been regularly physically active for the past 6 months?	☐	☐

Please answer these questions based on your physical activity **during the past 7 days**.

How often did you engage in stationary activities as reading, watching TV, computer games, or doing handcrafts?

- ☐ Never
- ☐ Seldom (1-2 days)
- ☐ Sometimes (3-4 days)
- ☐ Often (5-7 days)

On average, how many hours per day did you spend in these stationary activities?

- ☐ No Time
- ☐ Less than 1 hour
- ☐ More than 1 hour but less than 2 hours
- ☐ 2 to 4 hours
- ☐ More than 4 hours

How often did you walk outside your home other than specifically for exercise? For example, getting to work or class, walking the dog, shopping, or other errands?

- ☐ Never
- ☐ Seldom (1-2 days)
- ☐ Sometimes (3-4 days)
- ☐ Often (5-7 days)

On average, how many hours per day did you spend walking outside your home?

- ☐ No Time
- ☐ Less than 1 hour
- ☐ More than 1 hour but less than 2 hours
- ☐ 2 to 4 hours
- ☐ More than 4 hours

How often did you engage in light sport or recreational activities such as bowling, golf with a cart, hunting or fishing, darts, billiards or pool, therapeutic exercise (physical or occupational therapy, stretching) or similar activities?

- ☐ Never
- ☐ Seldom (1-2 days)
- ☐ Sometimes (3-4 days)
- ☐ Often (5-7 days)

On average, how many hours per day did you spend in these light sport or recreational activities?

- ☐ No Time
- ☐ Less than 1 hour
- ☐ More than 1 hour but less than 2 hours
- ☐ 2 to 4 hours
- ☐ More than 4 hours

How often did you engage in moderate sport or recreational activities such as tennis, softball, golf without a cart, or dancing for pleasure or similar activities?

- ☐ Never
- ☐ Seldom (1-2 days)
- ☐ Sometimes (3-4 days)
- ☐ Often (5-7 days)

On average, how many hours per day did you spend in these moderate sport or recreational activities?

- ☐ No Time
- ☐ Less than 1 hour
- ☐ More than 1 hour but less than 2 hours
- ☐ 2 to 4 hours
- ☐ More than 4 hours

How often did you engage in strenuous sport and recreational activities such as jogging, swimming, aerobic dance, cycling (hand or leg), singles tennis, rugby, basketball, or other similar activities.

- ☐ Never
- ☐ Seldom (1-2 days)
- ☐ Sometimes (3-4 days)
- ☐ Often (5-7 days)

On average, how many hours per day did you spend in these strenuous sport or recreational activities?

- ☐ No Time
- ☐ Less than 1 hour
- ☐ More than 1 hour but less than 2 hours
- ☐ 2 to 4 hours
- ☐ More than 4 hours

How often did you do any exercise specifically to increase muscle strength and endurance such as lifting weights, push-ups, pull-ups or dips?

- ☐ Never
- ☐ Seldom (1-2 days)
- ☐ Sometimes (3-4 days)
- ☐ Often (5-7 days)

On average, how many hours per day did you spend in these exercises to increase muscle strength and endurance?

- ☐ No Time
- ☐ Less than 1 hour
- ☐ More than 1 hour but less than 2 hours
- ☐ 2 to 4 hours
- ☐ More than 4 hours

How often have you done any light housework, such as dusting, sweeping floors or washing dishes?

- ☐ Never
- ☐ Seldom (1-2 days)
- ☐ Sometimes (3-4 days)
- ☐ Often (5-7 days)

On average, how many hours per day did you spend doing light housework?

- ☐ No Time
- ☐ Less than 1 hour
- ☐ More than 1 hour but less than 2 hours
- ☐ 2 to 4 hours
- ☐ More than 4 hours

How often have you done any heavy housework or chores such as vacuuming, scrubbing floors, washing windows, or walls, etc.?

- ☐ Never
- ☐ Seldom (1-2 days)
- ☐ Sometimes (3-4 days)
- ☐ Often (5-7 days)

On average, how many hours per day did you spend doing home repairs?

- ☐ No Time
- ☐ Less than 1 hour
- ☐ More than 1 hour but less than 2 hours
- ☐ 2 to 4 hours
- ☐ More than 4 hours

How often have you done lawn work or yard care including mowing, leaf or snow removal, tree or bush trimming, or wood chopping, etc.?

- ☐ Never
- ☐ Seldom (1-2 days)
- ☐ Sometimes (3-4 days)
- ☐ Often (5-7days)

On average, how many hours per day did you spend doing lawn work?

- ☐ No Time
- ☐ Less than 1 hour
- ☐ More than 1 hour but less than 2 hours
- ☐ 2 to 4 hours
- ☐ More than 4 hours

How often have you done outdoor gardening?

- ☐ Never
- ☐ Seldom (1-2 days)
- ☐ Sometimes (3-4 days)
- ☐ Often (5-7 days)

On average, how many hours per day did you spend doing outdoor gardening?

- ☐ No Time
- ☐ Less than 1 hour
- ☐ More than 1 hour but less than 2 hours
- ☐ 2 to 4 hours
- ☐ More than 4 hours

Please rate the frequency with which friends or family members did or said what is described in each item over the last 3 months on a scale from "never" to "very often".

	1-Never	2	3	4	5-Very Often
My friend exercised with me.	☐	☐	☐	☐	☐
My friend offered to exercise with me.	☐	☐	☐	☐	☐
My friend gave me helpful reminders to exercise.	☐	☐	☐	☐	☐
My friend gave me encouragement to stick with my exercise program.	☐	☐	☐	☐	☐
My friend changed their schedule so we could exercise together.	☐	☐	☐	☐	☐
My family member exercised with me.	☐	☐	☐	☐	☐
My family member gave me encouragement	☐	☐	☐	☐	☐

	1-Never	2	3	4	5-Very Often
to stick with my exercise program.					
My family member changed their schedule so we could exercise together.	☐	☐	☐	☐	☐
My family member offered to exercise with me.	☐	☐	☐	☐	☐
My family member gave me helpful reminders to exercise.	☐	☐	☐	☐	☐
My family member planned for exercise on recreational outing.	☐	☐	☐	☐	☐
My family member discussed exercise with me.	☐	☐	☐	☐	☐
My family member talked about how much they like to exercise.	☐	☐	☐	☐	☐
My family member helped plan activities around my exercise.	☐	☐	☐	☐	☐
My family member asked me for ideas on how they can get more exercise.	☐	☐	☐	☐	☐
My family member took over chores so I had more time to exercise.	☐	☐	☐	☐	☐
My family member made positive	☐	☐	☐	☐	☐

	1-Never	2	3	4	5-Very Often
comments about my physical appearance.					
My family member got angry at me for exercising.	☐	☐	☐	☐	☐
My family member criticized me or made fun of me for exercising.	☐	☐	☐	☐	☐
My family member gave me rewards for exercising.	☐	☐	☐	☐	☐

The questions in this scale ask you about your feelings and thoughts during the last month. For each question, choose from the following alternatives.

	Never	Almost Never	Sometimes	Fairly Often	Very Often
How often have you been upset because of something that happened unexpectedly?	☐	☐	☐	☐	☐
How often have you felt that you were unable to control the important things in your life?	☐	☐	☐	☐	☐
How often have you felt nervous and "stressed"?	☐	☐	☐	☐	☐
How often have you dealt successfully with irritating life hassles?	☐	☐	☐	☐	☐
How often have you felt that you were effectively coping with important changes that were occurring in your life?	☐	☐	☐	☐	☐

	Never	Almost Never	Sometimes	Fairly Often	Very Often
How often have you felt confident about your ability to handle your personal problems?	☐	☐	☐	☐	☐
How often have you felt that things were going your way?	☐	☐	☐	☐	☐
How often have you found that you could not cope with the things that you had to do?	☐	☐	☐	☐	☐
How often have you been able to control irritations in your life?	☐	☐	☐	☐	☐
How often have you felt that you were on top of things?	☐	☐	☐	☐	☐
How often have you been angered because of things that happened that were outside of your control?	☐	☐	☐	☐	☐
How often have you been able control the way you spend your time?	☐	☐	☐	☐	☐
How often have you felt difficulties were piling up so high that you could not overcome them?	☐	☐	☐	☐	☐

Please circle the number that best describes how you feel about the following statements.

	Not at all True	Rarely True	Somewhat True	Always True
I am confident that I can overcome barriers and challenges with regard to physical activity and	☐	☐	☐	☐

	Not at all True	Rarely True	Somewhat True	Always True
exercise if I try hard enough.				
I am confident that I can find means and ways to be physically active and exercise.	☐	☐	☐	☐
I am confident that I can accomplish my physical activity and exercise goals that I set.	☐	☐	☐	☐
I am confident that when I am confronted with a barrier to physical activity and exercise, I can find several solutions to overcome this barrier.	☐	☐	☐	☐
I am confident that I can be physically active and exercise even when I am tired.	☐	☐	☐	☐
I am confident that I can be physically active even when I am feeling depressed.	☐	☐	☐	☐
I am confident that I can be physically active and exercise even without the support of my family and friends.	☐	☐	☐	☐
I am confident that I can be physically active and exercise without the help of a therapist or trainer.	☐	☐	☐	☐
I am confident that I can motivate myself to start being physically active	☐	☐	☐	☐

	Not at all True	Rarely True	Somewhat True	Always True
and exercising again after I've stopped for a while.				
I am confident that I can be physically active and exercise even if I had no access to gym, exercise training, or rehabilitation facility.	☐	☐	☐	☐