

## ABSTRACT

Title of Dissertation: BIOPSYCHOSOCIAL INFLUENCES ON THE  
SUBJECTIVE WELL-BEING AND COLLEGE  
ADJUSTMENT OF STUDENTS WITH DIAGNOSED  
AD/HD

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For many years, Attention-Deficit Hyperactivity Disorder (AD/HD) was considered a disorder of childhood that was outgrown in adolescence and adulthood. Follow-up studies of children over the past twenty years, however, have consistently demonstrated that up to 80% of children with diagnosed AD/HD in childhood continue to display the symptoms to a significant degree in adolescence and adulthood (Barkley & Murphy, 1998). Given this reconceptualization, there has been an increase in research on late adolescent and adult AD/HD. Such research has demonstrated the risk of negative academic and psychosocial outcomes for late adolescents and adults with AD/HD. Very little research, however, has focused on examining variables related to adjustment outcomes specifically in the AD/HD college student population. Applying a biopsychosocial framework, the primary purpose of this study was to simultaneously examine the relation of multiple biomedical and psychosocial factors to the subjective well-being and college adjustment of students with diagnosed AD/HD.

Self-report measures of current AD/HD symptom severity, psychosocial factors (e.g., college self-efficacy, self-esteem, and social support), subjective well-being, and college adjustment were completed by 80 undergraduate students at the University of Maryland with diagnosed AD/HD registered with the Learning Assistance/Disability Support Service. Results indicated that 53% of the variance in subjective well-being, and 57% of the variance in overall college adjustment were accounted for by all of the biopsychosocial variables combined. In addition, the individual biomedical and psychological factors were found to independently contribute unique and significant variance to both health status outcomes. Moreover, consistent with the hypotheses of the present study, the combined psychosocial variables were found to contribute unique and significant variance above and beyond AD/HD symptom severity, and the psychological variables (e.g., college self-efficacy and self-esteem) were found to partially mediate the relationship between social support and both health status outcomes.

This study contributes to the current literature on college students with AD/HD and demonstrates the importance of a biopsychosocial conceptualization and approach to working with students with AD/HD. Moreover, results highlight potential ways to tailor .effective interventions for this population, and interesting directions for future research.

BIOPSYCHOSOCIAL CORRELATES OF THE SUBJECTIVE WELL-BEING  
AND COLLEGE ADJUSTMENT OF STUDENTS WITH  
DIAGNOSED AD/HD

by

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## DEDICATION

I would like to thank my husband Jeff for all of his love and support, and especially my parents, sister Kathleen, Aunt Maryan, Uncle Bob, and Aunt Dorothy for all of their continued love, support, and encouragement throughout the years, which has helped me get to this point. I would also like to thank my advisor, Dr. Mary Ann Hoffman, and colleague, Dr. Bradley Brenner for their guidance throughout this process. Finally, I would like to dedicate the completion of this dissertation in loving memory of my Aunt Agnes Malone, whose gentle and genuine spirit continues to bring out the best in all of us.

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## Chapter 1

### *Introduction*

Late adolescence is a time of great developmental transition and change, including many new issues related to identity, independence, and adjustment (Kenny & Rice, 1995). Many adolescents leave home during this time, living away from familiar sources of support. The implications of these changes for personal well-being have led to much of counseling psychology's interest in adjustments during the late adolescent period, particularly in terms of college adjustment and transitions (Kenny & Rice, 1995). In fact, Gelso and Fretz (1992) highlight that a primary unifying theme of counseling psychology is the focus on adaptation and adjustment to various life transitions, including late adolescent adjustment to college.

Though such transitions pose significant challenges for any adolescent, they become significantly greater for adolescents and young adults struggling with Attention-Deficit/Hyperactivity Disorder (AD/HD) (Quinn, 1996). AD/HD is comprised of developmentally inappropriate high levels of inattention, impulsivity, and/or overactivity that arise in early childhood (Barkley, Anastopoulos, Guevremont, & Fletcher, 1991). More specifically, according to the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association (American Psychiatric Association, 2000), Attention Deficit/Hyperactivity Disorder (AD/HD) is a persistent pattern of inattention and/or hyperactivity, which is more frequent and severe than is typically observed among individuals at a comparable level of development. The DSM-IV outlines three subtypes of AD/HD including: (a) the inattentive subtype characterized

primarily by inattentive symptoms; (b) the hyperactive-impulsive subtype, characterized primarily by hyperactive-impulsive symptoms; and (c) the combined subtype, in which both inattentive and hyperactive-impulsive symptoms are present. Throughout this dissertation, the AD/HD label is used in discussing Attention-Deficit/Hyperactivity Disorder across subtypes.

For many years, AD/HD was considered a disorder of childhood that was outgrown in adolescence and adulthood. Follow-up studies of children over the past twenty years, however, have consistently demonstrated that up to 80% of children diagnosed with AD/HD in childhood continue to display the symptoms to a significant degree in adolescence and adulthood (Barkley & Murphy, 1998). The DSM-IV now recognizes that AD/HD persists into late adolescence and adulthood. Given this reconceptualization, there has been an increase in research on late adolescent and adult AD/HD. Such research has mostly been in the form of long-term follow-up studies assessing psychosocial and behavioral outcomes of adolescents with AD/HD diagnosed in childhood (Barkley et al., 1991).

For example, controlled, prospective follow-up studies of AD/HD children (Weiss & Hechtman, 1993; Mannuzza, Klein, Bessler, Malloy, & LaPadula, 1993) indicate that, compared to controls, AD/HD late adolescents tend to complete less formal schooling, achieve lower grades, fail more courses, and are more often expelled from schools (Mannuzza & Klein, 1999). In addition, compared to non-AD/HD controls, AD/HD late adolescents tend to have poorer self-esteem and more functional impairments including academic, behavioral, and social adjustment difficulties (Mannuzza & Klein, 1999).

Research has demonstrated the risk of negative academic and psychosocial

outcomes for AD/HD late adolescents and adults. While such research encompasses the traditional age of college students (i.e., individuals 18 to 23 years of age), however, very little research has focused on examining variables related to adjustment outcomes specifically in the AD/HD college student population. College students with AD/HD is a unique population that is important and interesting to study for a number of reasons. For one, extensive research (Weiss & Hechtman, 1993; Biederman, Faraone, & Spencer et al, 1993) has demonstrated that a number of social and academic problems often accompany AD/HD, and that individuals with AD/HD tend to complete less formal education than the general population. A small percentage of AD/HD young adults, however, do enter college in spite of their AD/HD history, and there is a significant lack of data on factors related to the success and adjustment outcomes of these individuals (Dooling-Litfin & Rosen, 1997). Research on factors associated with the subjective well-being and college adjustment of AD/HD students addresses a significant gap in the current AD/HD and college student literature.

In addition, although the proportions of AD/HD individuals that enter college tend to be less than the general population (Weiss & Hechtman, 1993), the number of individuals on college campuses with AD/HD is steadily increasing (Wolfe, 2001). With the number of AD/HD individuals steadily increasing on college campuses, research on factors associated with the well-being and adjustment of AD/HD students might help inform remedial and multi-modal preventive interventions and services to address the needs of this growing high-risk population and enhance developmental outcomes.

While studies have begun to examine individual predictors of outcomes for AD/HD adolescents and adults, research had not yet utilized a conceptual framework to

simultaneously examine multiple biomedical and psychosocial factors associated with the subjective well-being and college adjustment of students with AD/HD. This study used a biopsychosocial framework (Hoffman & Driscoll, 2000) to examine the relationship of multiple biopsychosocial factors (including AD/HD symptom severity, college self-efficacy and self-esteem, and social support) in relation to the subjective well-being and college adjustment of students with diagnosed AD/HD.

## Chapter 2

### *Literature Review*

Late adolescence is a time of great developmental transition and change (Kenny & Rice, 1995). Many adolescents leave home during this time to begin college, facing many new personal, academic, and social challenges. Adjusting to college imposes great adaptive demands on late adolescents, who are often away from familiar sources of support (Kenny & Rice, 1995). For example, the college environment is inherent with a variety of daily challenges, including new responsibilities for managing one's daily life and activities. Given the many new personal, social, and academic demands it entails, adjusting to college may be considered a major challenge to the adaptive strategies of the late adolescent.

Coping theory and research highlight that individuals must draw upon many psychological and social resources in order to successfully adjust to major life events and transitions (Lazarus & Folkman, 1984). Lazarus and Folkman (1984) define *personal resources* as what individuals draw on in order to cope and adjust, emphasizing that personal and social resources are linked to remaining healthy under adaptive challenges (Holahan & Moos, 1987; Holahan, Moos, & Schaefer, 1996).

While adjusting to college poses many challenges for any adolescent, such challenges often become exacerbated for students with AD/HD (Quinn, 1996). For example, the inattentive and/or hyperactive and impulsive symptoms of AD/HD often make it difficult for individuals with the disorder to manage daily life. Individuals with AD/HD often have difficulties regulating emotion, successfully negotiating social relationships, and exercising the behavioral control to complete and follow through on

assigned tasks based on their symptomatology (Barkley, 1990). While children and adolescents in elementary and high school environments often have parents and school systems assisting them with managing such symptoms and structuring daily routines and tasks, in the college setting, late adolescents are expected to assume much greater responsibility for managing their own lives. In many ways, the symptomatology of AD/HD provides additional biomedical and psychosocial challenges for the college student, without many of the supports that may have been present in the young person's life previously. Given the many additional biomedical and psychosocial challenges related to AD/HD, it seems that students with AD/HD would need to rely even more greatly on personal and psychosocial resources in successfully adjusting to the demands of the college environment (Quinn, 1996).

Utilizing a biopsychosocial framework, the primary purpose of this study was to simultaneously examine the relation of multiple biomedical and psychosocial factors to the subjective well-being and college adjustment of students with diagnosed AD/HD. More specifically, it investigated the role of the severity of current AD/HD symptoms, college self-efficacy, self-esteem, and social support in predicting these health status outcomes for students with diagnosed AD/HD. Moreover, it examined the potential mediating role of self-esteem and college self-efficacy in the relationship between social support and these health status outcomes for the sample.

First, in order to provide a foundation for the discussion of AD/HD in late adolescence and young adulthood (i.e., the traditional age of the college population), information regarding the basic neurobiology, etiology, frequency, and symptomatology of AD/HD is presented. Next, research on the psychosocial outcomes of late adolescent

and adult AD/HD is discussed, highlighting the need to examine multiple biopsychosocial factors associated with the well-being and adjustment of individuals with AD/HD. Third, this dissertation provides a review of recent studies on psychosocial outcomes and factors related to outcomes for college students with AD/HD. Fourth, in light of the findings and limitations of current research, the biopsychosocial model of health status is presented as an applicable conceptual framework for having explored the relationship between biomedical and psychosocial factors to health status outcomes (e.g., subjective well-being and college adjustment) of college students with AD/HD. Finally, a delineation of these important biomedical, psychological, and social factors associated with the subjective well-being and college adjustment of AD/HD students is outlined in the context of findings of the well-being, coping and adjustment, and AD/HD college student literature.

#### *AD/HD Neurobiology, Etiology, and Symptomatology*

First, in order to provide a foundation for discussing the implications of AD/HD in late adolescence and adulthood, it is important to discuss current ideas and knowledge regarding the neurobiological basis, etiology, and symptomatology of AD/HD. Over the past two decades, much scientific research has focused on examining various brain structures and processes in order to understand both normal and abnormal conditions of the brain (Nadeau, 1995). As a result, there has been an accumulation of neuroscientific data to support that disorders such as AD/HD are the result of neuroanatomical and neurochemical abnormalities in the brain (Nadeau, 1995). Therefore, AD/HD may be described as a *neurobiological disorder*, which is a term used to describe any disorder that has a physical, neuroanatomical, or neurochemical basis (Nadeau, 1995).

Though varying in degrees and types of manifestations, there are certain common elements of AD/HD in terms of causal theories, neurobiological basis, manifestation, and diagnosis (Barkley et al., 1991). In order to discuss the basic neurobiology of AD/HD, it is important to first define some basic terms of neuroanatomy and brain functioning.

The human brain is comprised of networks of individual cells called *neurons*, which are the structural and functional units of the nervous system. Neurons manufacture and release chemical messengers called *neurotransmitters*. *Axons* are the long, tube-like parts of the neurons that extend to the next neuron in a pathway in the brain. Neurotransmitter molecules are released into the space between cells, or the *synapse*, which is the place where two neurons in a neural pathway communicate. More specifically, an impulse traveling along an axon of the first neuron releases chemicals called *neurotransmitters*, which unlock impulses in the second neuron when it reaches the synapse. *Gray matter* refers to the collections of neuronal cell bodies, where incoming signals are processed. *White matter* refers to bundles of axons which connect neurons (Castellanos, 1997).

The *basal ganglia* are comprised of four collections of gray matter located deep in the cerebral hemispheres of the brain. The *thalamus* is the part of the brain which receives inputs from all of the senses (except for the sense of smell), and synthesizes and relays this sensory information to specific areas of the brain. The *cerebellum* is a portion of the lower back part of the brain involved in the control and coordination of skeletal muscles for voluntary movements. The *cortex* is the outer layer of gray matter covering the cerebral hemispheres. Finally the *prefrontal cortex* is the portion of the cortex located directly behind the forehead. The prefrontal cortex is the most developed part of the brain in humans (as compared to other animals) (Castellanos, 1997), and comprises a



significant portion of the *frontal lobes*, which are the most anterior lobes of the brain (Benson & Miller, 1997).

A simplified model of AD/HD is that it involves a dysregulation of the neurotransmitters dopamine and norepinephrine that originate in the lower brain and limbic structures and impair the frontal lobes of the brain (Nadeau, 1995). One of the first models used to explain AD/HD was the *catecholamine hypothesis* (Kornetsky, 1970), referring to the hypothesized malfunctioning of the neurotransmitters dopamine and norepinephrine in various brain structures (Nadeau, 1995). Since 1970, several clinical and animal studies have confirmed the role of the impaired functioning of dopamine and norepinephrine in AD/HD (Nadeau, 1995). For example, animal studies (Shaywitz, Yager, & Klopper, 1976) have demonstrated that hyperactive and impulsive behavior result from impairments in the catecholamine neurotransmitter system in the frontal lobes of the brain (Nadeau, 1995).

While biochemical studies have been unable to pinpoint the exact nature of the neurochemical dysregulation in AD/HD, studies have demonstrated that the manufacturing and transmission processes of neurons and synapses are impaired in AD/HD individuals, disrupting the neurochemical balance needed to facilitate optimal brain functioning (Nadeau, 1995). Furthermore, neurochemical and non-invasive brain studies have implicated the malfunctioning of the frontal lobes of the brain in AD/HD. More specifically, it is now generally believed that AD/HD results from the disinhibition of the frontal lobes (Nadeau, 1995).

Primary tasks of the frontal lobes include handling sequentially received information, integrating current experience with past experience, monitoring present behavior, inhibiting inappropriate responses, and organizing and planning for the attainment of future goals (Nadeau, 1995). These functions are commonly referred to as *executive functions*, which have been defined as “control processes [involving] inhibition and delay of responding allowing an individual to initiate, sustain, inhibit/stop, and shift activities and focus” (Denckla, 1996). The basic elements of executive function are the ability to initiate, sustain, inhibit, and shift attention (Nadeau, 1995). Executive functions include oversight or managerial functions such as organization, planning, sustained attention, and the complex integration of affective, cognitive, and temporal information (Nadeau, 1995).

The brain circuits that serve executive functions include the prefrontal cortex, the basal ganglia, and the cerebellum (Castellanos, 1997). More specifically, these circuits consist of neurons in the prefrontal regions of the brain that synapse in basal ganglia relay stations, send signals to synapses in the thalamus, feeding back to the cortex (Alexander et al., 1986). This “cortical-striatal-thalamic-cortical circuit” provides feedback to other regions of the brain, and is believed to serve as the brain’s “braking mechanism” and anatomical basis of executive functions (Castellanos, 1997).

Complementary to the catecholamine hypothesis, Chelune, Ferguson, Koon, and Dickey (1986) proposed the *frontal lobe hypothesis* of AD/HD, based on neuropsychological studies that have localized the disinhibitory disorder of AD/HD in the frontal lobes of the brain (Nadeau, 1995). The frontal lobe hypothesis of AD/HD has

been supported by research. For example, studies using a procedure known as positron-emission tomography (PET) have demonstrated decreased metabolism in the frontal lobes of the brain in adults with AD/HD (Zametkin & Liotta, 1998). In addition, other investigators have measured cerebral blood flow in the brain, finding decreased blood flow in the prefrontal regions of the brain in AD/HD individuals (Castellanos, 1997).

The catecholamine and frontal lobe hypotheses of AD/HD are complementary in that the prefrontal cortex is rich in catecholamines, and the presence and regulation of dopamine and norepinephrine in the prefrontal regions of the brain is crucial to the functioning of the frontal lobes (Nadeau, 1995). In sum, an integrated model of AD/HD may be summarized as a “dysregulation of certain neurotransmitters in the brain, particularly dopamine and norepinephrine, which influences the adequate processing of internal and environmental stimuli” (Nadeau, 1995, p.25). These neurotransmitters affect the production, use, and regulation of other neurotransmitters in addition to the functioning and maturation of certain brain structures (Nadeau, 1995). In particular, the dysregulated neurotransmitter system impairs the frontal lobes, including adequate blood flow and glucose metabolism in the frontal lobes, rendering them unable to inhibit and control input from lower brain structures (Nadeau, 1995). As a result, various symptoms of AD/HD arise, including distractibility, the inability to focus attention and remain on task, the inability to inhibit thought and behavior, and emotional lability (Nadeau, 1995). These symptoms subsequently often influence learning, memory and information processing across multiple life contexts (Nadeau, 1995).

Extensive research including family aggregation, adoption research, and twin studies (Barkley et al., 1990; Biederman et al., 1992; Pauls, 1991; Morrison & Stewart, 1993; Edelbrock, Rende, Plomin, & Thompson, 1995; Gillis, Gilger, Pennington, & Defries, 1992; Levy & Hay, 1992) have demonstrated that neurological and genetic factors make significant contributions to the symptoms and occurrence of AD/HD (Barkley, 1998). A variety of genetic and neurological factors (e.g., pregnancy and birth complications, acquired brain damage, environmental toxins, infections, and genetic effects) can cause a disturbance in the nervous system giving rise to AD/HD (Barkley, 1998). Cases of AD/HD can also arise without a genetic predisposition if a child is exposed to a significant neurological injury or disruption affecting the cortical-striatal network in the brain (Barkley, 1998).

The estimated prevalence of AD/HD in the United States is 3-5% of the general childhood population, and tends to be more commonly diagnosed in males than in females (Barkley, 1998). For many years, AD/HD was considered a disorder of childhood that was outgrown in adolescence and adulthood. Follow-up studies of children over the past twenty years, however, have consistently demonstrated that up to 80% of children diagnosed with AD/HD in childhood continue to display the symptoms to a significant degree in adolescence and adulthood (Barkley, 1998).

Though studies have not directly examined the prevalence of AD/HD in the college population, researchers (Hill & Schoener, 1996) have projected a 0.8% prevalence of AD/HD among college-age adults based on mathematical extrapolation from existing studies (Turnock, Rosen, & Kaminski, 1998). Other recent evidence

suggests an even higher prevalence of AD/HD among college students (Dooling-Litfin & Rosen, 1997; Litfin, 1996; Ramirez et al., 1997; Weyandt, Linterman, & Rice, 1995) (Turnock, Rosen, & Kaminski, 1998).

Symptoms of AD/HD may include inattention, impulsivity, distractibility, motor restlessness, poor organization, impersistence, low frustration tolerance, and/or emotional outbursts (Nadeau, 1995). Many individuals with AD/HD often have difficulty completing tasks, are forgetful, and procrastinate (Quinn, 1996). Though every individual may experience such difficulties from time to time, the symptoms have their onset in childhood and are pervasive for the individual with AD/HD, interfering with two or more areas of life functioning (Nadeau, 1995).

More specifically, the essential feature of AD/HD is a persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequent and severe than is typically experienced by individuals at a comparable level of development (Barkley, 1998). In addition, some hyperactive-impulsive or inattentive symptoms that cause impairment must have been present before seven years of age, though many individuals may be undiagnosed until after the symptoms have been present for a number of years. Furthermore, some impairment from the symptoms must be present in at least two settings, such as at school and at home, and there must be evidence of interference with developmentally appropriate social, academic, or occupational functioning (American Psychiatric Association, 2000).

Inattentive symptoms of AD/HD may manifest across a variety of contexts, including academic, occupational, or social situations. Individuals with AD/HD may fail

to give close attention to details, or make careless mistakes in schoolwork or other tasks. In addition, individuals with AD/HD often have difficulty sustaining attention and find it hard to persist with tasks until completion (Barkley, 1998). Furthermore, AD/HD individuals often have difficulties organizing tasks and activities, and have particular difficulty with tasks that require sustained mental effort or that require organization or close concentration, such as paperwork and homework. Subsequently, the work and study habits of AD/HD individuals are often disorganized, and the materials needed to complete tasks are often lost or scattered (American Psychiatric Association, 2000). Finally, individuals with AD/HD are often easily distracted, frequently interrupt tasks, are forgetful in daily activities, and have difficulty listening to others and focusing during conversations (American Psychiatric Association, 2000).

Hyperactivity in AD/HD individuals may be manifested in fidgetiness, excessive activity, or by talking excessively. In adolescents and adults, hyperactivity often takes the form of feelings of restlessness and difficulty engaging in quiet and sedentary activities. Furthermore, impulsivity in AD/HD manifests often as impatience, difficulty in delaying responses and waiting, and frequently interrupting or intruding on others to the point of interfering with social, academic, and/or occupational functioning (American Psychiatric Association, 2000).

The behavioral manifestations of AD/HD usually appear in multiple contexts, and to make the diagnosis of AD/HD, some impairment must be present in at least two settings (i.e., home and school). The DSM-IV identifies three AD/HD subtypes: (a) AD/HD predominantly inattentive subtype, (b) AD/HD hyperactive-impulsive subtype,

and (c) AD/HD combined (inattentive and hyperactive-impulsive) subtype (Barkley et al., 1991). The distinction between these diagnostic subtypes is based on the presence and severity of the inattentive and/or hyperactive-impulsive symptoms of AD/HD (Barkley, 1998).

The AD/HD predominantly inattentive subtype is diagnosed if six or more symptoms of inattention (but fewer than six symptoms of hyperactivity-impulsivity) have persisted for at least six months. The AD/HD predominantly hyperactive-impulsive subtype is diagnosed if six or more symptoms of hyperactivity-impulsivity (but fewer than six symptoms of inattention) have persisted for at least six months. The AD/HD combined type is diagnosed if six or more symptoms of inattention *and* six or more symptoms of hyperactivity-impulsivity have persisted for at least six months (American Psychiatric Association, 2000).

AD/HD very commonly occurs with other learning and psychiatric conditions (Jensen, Martin, & Cantwell, 1997). When various learning and/or psychiatric conditions occur in conjunction with one another, they are referred to as *comorbid* conditions. Several research studies have examined patterns of AD/HD comorbidity, demonstrating that affective disorders, such as depression and anxiety, conduct disorders, and other specific learning disorders are commonly diagnosed in conjunction with AD/HD (Jensen et al., 1997; Pliszka, 1998).

A variety of tricyclic and antidepressant medications are often prescribed and used to manage the symptoms of AD/HD (Fagel & Heiligenstein, 1996). The most commonly prescribed medications for AD/HD are methylphenidate (Ritalin) and dextroamphetamine (Dexedrine). AD/HD medications work by stimulating the effects of

dopamine and other neurotransmitters affecting the frontal lobes and corpus callosum of the brain (Quinn, 1996). More specifically, stimulant medications increase the release or block the reabsorption of dopamine and norepinephrine.

AD/HD medications vary in their rate of absorption and time span of effectiveness. For example, Ritalin, the most commonly prescribed stimulant, is taken at multiple points in the day and usually starts to work 15 to 30 minutes after it is taken and peaks at an average of 90-120 minutes after it is taken. The effect of a dose usually lasts from 2.5 to 4 hours. Many AD/HD individuals take a morning dose of Ritalin and another dose in the afternoon. Depending on when the individual takes the doses, there may be points in the day where there is no medication effect and s/he may have more difficulty attending and concentrating (Watkins, 2002).

In addition to short-acting stimulant medications such as Ritalin, there are also slow-release and longer duration stimulants. For example, Concerta is a relatively new AD/HD medication, and is a form of methylphenidate that acts in a “slow-release” pattern, delivering methylphenidate to the system in a pulsed pattern throughout the day. Such slow-release stimulants allow the individual to experience a 12-hour response to the medication from a single daily dose (Watkins, 2002).

Side effects of AD/HD stimulant medications are generally mild and vary from individual to individual. Certain adverse effects can be anticipated based on the pharmacologic properties of the drug (e.g., appetite change, insomnia), while other effects may be more difficult to anticipate (Nadeau, 1995). Certain adverse effects can be anticipated based on the pharmacologic properties of the drug (e.g., appetite change, insomnia), while other effects may be more difficult to anticipate (Nadeau, 1995). Side



effects can generally be managed through adjustment of the timing of administration or dosage of the medication (Nadeau, 1995).

Despite potential side effects and individual variations in responses to stimulant medications, overall research has supported the effectiveness of stimulant and antidepressant medications in treating the symptoms of AD/HD in children and adolescents (Barkley, 2004; Spencer, Biederman, & Wilens, 1998). Such research has demonstrated that stimulant medications assist in enhancing persistence and concentration, decreasing motor activity, and promoting goal-oriented behavior (Javorsky & Gussin, 1994). In addition, research has demonstrated that such medications improve attention, academic performance, social behavior, and reduce noncompliance, impulsivity, overactivity, and aggressive behavior in individuals with AD/HD (Barkley, 2004).

In the college context, AD/HD symptoms can put a student at risk for experiencing a variety of difficulties. For example, AD/HD may be considered a performance-based deficit rather than a skill-based deficit (Javorsky & Gussin, 1994). In other words, students with AD/HD often know what to do and have the ability to perform a task, but lack the cognitive and behavioral control to complete and follow through on assigned tasks (Barkley, 1990). While during elementary and high school students often have direct daily assistance from parents and school systems in structuring routines and assignments, in the college setting, much of this responsibility shifts to the student, who is expected to structure and organize his or her own time and often more longer-term and complex assignments. Given the demands of the college context, AD/HD students often have great difficulty with procrastination, time management, setting and following

through on goals and completing assignments (Quinn, 1996). In addition, individuals with AD/HD often have difficulty sustaining attention on tasks that are considered routine and tedious (Quinn, 1996). Given these difficulties, college students with AD/HD may have difficulty developing an appropriate understanding of social, living, and daily skills in the college environment (Javorsky & Gussin, 1994).

Furthermore, given difficulties with impulse control, college students with AD/HD have been found to have a higher than average use of alcohol and marijuana, (often as an attempt to self-medicate), given that these substances tend to reduce the severity of AD/HD symptoms through their impact on the nervous system (Barkley, 1990). Moreover, hyperactive symptoms may be manifested in college students with AD/HD in the form of physical restlessness and sleeping difficulties, which may result in difficulties attending classes and focusing on lectures over extended periods of time (Quinn, 1996). Overall, AD/HD symptoms may potentially impact the well-being and college adjustment of students with AD/HD in a variety of ways, including impaired academic performance, difficulties with time management, completing assignments, and emotion regulation in the midst of the stresses and demands of college life (Quinn, 1996).

Given that stimulant medication has proven to be an effective treatment for individuals with AD/HD, on-campus and off-campus health service providers often prescribe psychostimulants and monitor medication for college students with AD/HD to help alleviate their symptoms (Quinn, 1996). In addition to medication, there are usually also a variety of institutional resources that are both legally and informally made available to the AD/HD college student to assist with their personal, academic, and social adjustment to college. Examples of standard legal accommodations for college students

with AD/HD include arranging for exams to be taken in a distraction-free room, extended time for exams, coordinating note-taking services, and/or arranging for a note-taker in class. Also, other more informal institutional support services may include individual assistance with time management, test-taking strategies, and/or support groups (Richard, 1995). While a variety of support services are available to the AD/HD college student, little research has examined the relationship between AD/HD students' perceptions of such support and their well-being and college adjustment.

In sum, an accumulation of neuroscientific data over the past two decades has supported that AD/HD symptoms result from neuroanatomical and neurochemical abnormalities in the brain. Changes in the definition and diagnostic criteria for AD/HD have paralleled advances in research on AD/HD over the years. Originally conceptualized as a disorder of childhood, AD/HD is now known to commonly persist into late adolescence and adulthood, with its characteristic symptoms of inattentiveness and/or hyperactivity-impulsivity potentially interfering with many aspects of functioning and well-being. In the college context, the symptoms of AD/HD can manifest in a variety of difficulties meeting many new academic personal and social challenges in adjusting to college. Having discussed the basic neurobiology, etiology, and symptomatology of AD/HD, the next section will discuss more in depth the research on the implications and psychosocial outcomes of AD/HD in late adolescence and adulthood, including current research on college students with AD/HD.

#### *Psychosocial Outcomes of Late Adolescents and Adults with AD/HD*

Given that for many years AD/HD was considered a childhood disorder that was outgrown in adolescence and adulthood, much of the research on AD/HD up until the

1970's focused on the manifestations and psychosocial outcomes of AD/HD in children. Follow-up studies of children over the past twenty to thirty years, however, have consistently demonstrated that up to 80% of children with diagnosed AD/HD continue to display symptoms to a significant degree in adolescence and adulthood (Barkley, 1998). Given this reconceptualization of AD/HD, there has been an increase in interest and a rise in research on the manifestations of AD/HD in late adolescence and adulthood. Such research has indicated that the late adolescents and adults with AD/HD are at risk for a variety of negative psychosocial outcomes as compared to their non-AD/HD peers.

For example, Mannuzza, Klein, Bessler, Malloy, and Hynes (1997) conducted a prospective follow-up study of boys clinically diagnosed with AD/HD at 7 years of age. Over 1,000 children were assessed at a child psychiatric research clinic, and 207 boys met the initial criteria for inclusion in the study including: (a) having been referred by teachers because of behavior problems, (b) having elevated hyperactivity ratings by teachers, parents, and clinic staff, (c) having been diagnosed by a child psychiatrist with hyperkinetic reaction of childhood (AD/HD), (d) having an IQ of at least 85, (5) being free of psychosis and neurological disorder, and (e) having English-speaking parents and a home telephone. The study reported on the adult outcome of 104 of the original 207 boys evaluated in childhood. A total of 64 controls were recruited at the time of the follow-up from nonpsychiatric outpatient clinics within the same medical center in which the probands were seen. Fourteen additional controls were recruited from a random community-sampling service to enlarge the control group. As with other controls, parents were asked whether teachers complained about the child's behavior in elementary school, and if not, the individual was recruited for the study. The resulting control group

consisted of 78 males, 16 to 21 years of age (mean age =18.6 years). Participants were administered the Schedule for the Assessment of Conduct, Hyperactivity, Anxiety, Mood, and Psychoactive Substances (Mannuzza & Klein, 1987), a semi-structured psychiatric interview including coverage for formulating DSM-III (American Psychiatric Association, 1980) and DSM-III-R (American Psychiatric Association, 1987) lifetime diagnoses. Interviewers were a clinical psychologist and a psychiatric social worker in private practice. All assessments were made without knowledge of the participants' group membership at follow-up. Results indicated that at follow-up, adults with AD/HD had relative deficits in educational achievement and occupational rank as compared to controls (Mannuzza et al., 1997). More specifically, at follow-up, on average the AD/HD participants had completed 2.2 years less schooling and held lower occupational positions than controls (Mannuzza et al., 1997).

There were a number of limitations to the study. For one, the sample size was somewhat small, particularly for the control group, and was comprised of all middle-class, white boys. Subsequently, the generalizability of the results was limited to individuals similar to those in the sample. In addition, AD/HD participants were non-randomly recruited from one psychiatric clinic, which may have further biased the sample and introduced confounds based on geographic region and socioeconomic status.

Also, Manuzza and Klein (1999) reviewed two controlled, prospective longitudinal follow-up studies of children with AD/HD. The studies demonstrated that in their late teens (compared with non-AD/HD comparisons), individuals with AD/HD show relative deficits in academic and social functioning, and some demonstrate pervasive antisocial behaviors, including drug abuse (Mannuzza & Klein, 1999).

More specifically, researchers (Weiss and Hechtman, 1993) conducted a 5-, 10-, and 15-year follow-up study of a sample of 104 AD/HD children between 6 and 12 years of age. A control group was recruited from the same schools that the AD/HD cases attended. In their 10-year follow up, the researchers found that at a mean age 19, AD/HD probands completed less formal schooling, achieved lower grades, failed more courses, and were more often expelled than controls without AD/HD. In addition, at an average age 18-19 years, compared to controls, AD/HD participants had fewer friends, scored more poorly on social skills and self-esteem tests, and were rated by clinicians as having poorer psychosocial adjustment (Hechtman, Weiss, & Perlman, 1980; Slomkowski, Klein, & Mannuzza, 1995; Weiss, Hechtman, & Perlman, 1978; Weiss et al., 1979) (Weiss & Hechtman, 1993).

Furthermore, Weiss and Hechtman (1993) examined several measures of predictive adult outcome of AD/HD including personal characteristics, current AD/HD symptoms, and the social, academic, and mental health of family members. Their findings indicated that adult psychosocial outcomes for individuals with previously diagnosed AD/HD were associated with a number of variables, including social skills, achievements and talents, AD/HD treatment history, current AD/HD symptoms, and having a supportive person in childhood. The findings of the Weiss and Hechtman (1993) study highlight the complexity of AD/HD and the need to examine multiple biopsychosocial factors predicting outcomes for AD/HD individuals (Dooling-Litfin & Rosen, 1997).

Similarly, researchers (Mannuzza, Klein, Bessler, Malloy, & La-Padula, 1993) conducted 9- and 16-year follow-up studies of AD/HD children. The initial cohort

consisted of 115 hyperactive children between 6 and 12 years of age who were participating in a treatment study restricted to pharmacotherapy (Gittelman-Klein, Klein, Katz, Saraf, & Pollack, 1976) (Mannuzza et al., 1993). A control group of (n = 100) was recruited from nonpsychiatric departments in the same medical center where the probands were seen. Participants were accepted as controls if no behavior problems were noted prior to age 13 in their charts, and if parents indicated that elementary school teachers never complained about their child's behavior. All adolescent and adult follow-up assessments were made by trained clinicians who were blind to the participant's group membership (proband or control group membership). This study also included an independent replication sample of 111 additional AD/HD children who were seen at the same clinic and recruited using the same inclusion and exclusion criteria as the first cohort. This second cohort was also followed up in late adolescence (Mannuzza et al., 1991) and adulthood (Mannuzza et al., 1997; Mannuzza, Klein, Bessler, Malloy, & LaPadula, 1998). At an 11-year follow-up (mean age = 18 years), results of the study indicated that at mean age 18, compared to controls, AD/HD probands obtained lower scores on standardized achievement tests (Piacentini, Mannuzza, & Klein, 1987) and more often repeated a grade, failed courses, and were expelled (Klein & Mannuzza, 1989) (Mannuzza & Klein, 1999). Furthermore, small yet significant group differences indicated that, independent of psychiatric mental status, AD/HD probands had lower scores on self-rated measures of self-esteem and clinician-rated measures of overall adjustment. These findings suggest poor self-esteem may be a particular feature of the longitudinal course of AD/HD (Mannuzza & Klein, 1999).

As Manuzza and Klein (1999) discuss in their review, strengths of these longitudinal studies included their prospective, controlled designs, respectable sample sizes, and assessments of the AD/HD individuals at multiple points in time by clinicians. Important limitations of the studies, however, include the homogeneity of the samples, with most samples being comprised of white, middle-class boys in a psychiatric outpatient clinics in limited geographic regions. This limits the generalizability of the findings of these studies to children and adults with AD/HD similar to the sample populations in the studies. In addition, the studies were limited by the lack of standard inclusion criteria in the AD/HD and control groups. For example, the studies relied primarily on self and observational report measures based on DSM-III criteria for hyperkinetic reaction of childhood rather than using standard, more updated DSM-IV criteria at follow-up to determine if participants still met more comprehensive criteria for inclusion in the AD/HD or control groups. Furthermore, some of the studies had somewhat small sample sizes given the number of variables considered and examined.

In sum, longitudinal follow-up studies of children with AD/HD have indicated that late adolescents and adults with AD/HD diagnosis and symptoms are at risk for poorer academic functioning, psychosocial adjustment, substance and alcohol abuse, and lower self-esteem than their non-AD/HD peers (Manuzza & Klein, 1999). Such outcome studies have indicated the risk of negative psychosocial outcomes of AD/HD late adolescents and adults. Moreover, such research has indicated that educational and psychosocial outcomes for AD/HD late adolescents and adults are not likely to be associated with any single variable, but rather with multiple biopsychosocial factors, including current AD/HD symptomatology, social skills, and social support (i.e., having a



supportive person in childhood) (Mannuzza & Klein, 1999). While research has begun to examine factors related to psychosocial outcomes of AD/HD in late adolescence and adulthood, little research has utilized a conceptual framework to explore the relation of multiple biopsychosocial factors to health status and adjustment outcomes for college students with AD/HD.

Having reviewed research on psychosocial outcomes of AD/HD late adolescents and adults in general, this review now turns to a discussion of current research specific to college students with AD/HD. Overall, there is a paucity of research specific to the AD/HD college population due to number of reasons. First, as already discussed, for many years AD/HD was considered a disorder of childhood that was outgrown in the adolescent and adult years. Research on AD/HD in age groups (i.e., late adolescence and young adulthood) that span the traditional age of college students is relatively new and mostly limited to longitudinal outcome studies of children with AD/HD. In addition, given the social and academic problems associated with AD/HD, AD/HD individuals tend to complete less formal education than the general population (Weiss & Hechtman, 1993). More specifically, Milroy and Perlman (1985) found that fewer than five percent of AD/HD participants had completed college compared to 40% of their non-AD/HD peers who had completed college (Weiss & Hechtman, 1993).

Given the small percentage of AD/HD students who enter and successfully complete college, little research has focused specifically on college students with AD/HD. This is an interesting group to study given that these students may be unique in their adjustment given that they have achieved some measure of success simply by being admitted to college (Dooling-Litfin & Rosen, 1997). This review will now discuss in

more detail the current research and findings on psychosocial outcomes and factors related to outcomes for college students with AD/HD.

### *Psychosocial Outcomes of College Students with AD/HD*

Within the limited body of literature on college students with AD/HD, researchers have mostly examined psychosocial outcomes of college students with AD/HD relative to their non-AD/HD peers. Similar to the general research on late adolescents and adults with AD/HD, such research has indicated that college students with AD/HD may be at risk for a variety of negative psychosocial outcomes in comparison to their non-AD/HD peers.

For example, Heiligenstein, Guenther, Levy, Savino, and Fulwiler (1999) assessed psychological and academic impairments in college students diagnosed with AD/HD in a retrospective chart review, using specifically defined diagnostic criteria and compared with a control group. Participants were 54 students at the University of Wisconsin-Madison who voluntarily presented for a comprehensive assessment at the Counseling and Consultation Service (CCS) on campus. The primary investigator retrospectively reviewed charts of 508 students seen for an initial assessment during the 1997 fall academic semester. The initial review yielded 69 charts meeting inclusion criteria of either a documented diagnosis of AD/HD or a request for career testing. According to their documentation, the AD/HD case group (n=26) had received a DSM-IV diagnosis of AD/HD, had a Brown Adult AD/HD Rating Scale score greater than 50, a report of childhood symptoms of AD/HD, and a Test of Variables of Attention (TOVA) profile consistent with AD/HD. The control group consisted of 28 students who came to the CCS with career concerns. Results indicated that students with AD/HD reported

poorer functioning than the control group on several academic variables, had significantly lower GPAs, and were more likely to be on academic probation than students in the control group.

The study had a number of methodological limitations. For example, while they used accepted diagnostic criteria for adult AD/HD based on DSM-IV criteria, they did not screen for additional learning or comorbid psychiatric disabilities that might have interfered with students' academic performance (Heiligenstein et al., 1999). In addition, the study design was retrospective, and the students' GPA, probation status, and report of college students' problems were subject to self-report bias (Heiligenstein et al., 1999). Furthermore, the sample was predominantly Caucasian (92% Caucasian for the AD/HD group and 89% Caucasian for the control group) limiting the generalizability of findings to the population of college students with a diagnosis of AD/HD similar to those selected for the study.

In another study, Dooling-Litfin and Rosen (1997) studied differences in the self-esteem of college students with a childhood history of AD/HD and their non-AD/HD peers. They also examined factors that contributed to positive self-esteem in college students with AD/HD. Participants were 563 university students (66.3% male and 33.7% female). The "identified" group consisted of 86 students (mean age = 19.53 years) who indicated that they had been identified as AD/HD in childhood, and the control group consisted of 477 randomly selected volunteers (mean age = 19.42 years) who had no childhood history of AD/HD. The researchers used Rosenberg's (1965) measure of self-esteem, Barkley's (1990) behavior checklist for AD/HD adults as a measure of AD/HD symptomatology, and Levenson and Gottman's (1978) Dating and Assertion

Questionnaire as a measure of social competence and dating assertion. Interestingly, they found that college students with a history of AD/HD had significantly lower self-esteem ratings relative to students without an identified history of AD/HD, even when controlling for gender, socioeconomic status, and aptitude test scores.

Furthermore, the researchers found social skills and current symptoms of AD/HD to be significant predictors of self-esteem among college students with a childhood history of AD/HD. Social skills and current symptoms of AD/HD accounted for 22% of the variance in self-esteem. More specifically, they found that higher social skills and fewer current AD/HD symptoms accounted for higher self-esteem and lower social skills and greater AD/HD symptomatology accounted for lower self-esteem in college students with a history of AD/HD.

A limitation of the study was its relatively homogenous sample (87.2% Caucasian students from an introductory psychology course at a large university in the Rocky Mountain area of the United States). In addition, as the authors noted, another limitation was that the participants were placed into groups according to a self-reported history of AD/HD, and there was no independent confirmation of the students' reports of their AD/HD diagnoses (Dooling-Litfin & Rosen, 1997).

Furthermore, in another study, Wallace, Winsler, and NeSmith (1999) explored factors associated with the success of college students with AD/HD. Forty-four students diagnosed with AD/HD at the University of Alabama completed a 107-item survey pertaining to issues associated with AD/HD symptomatology, planning activities, study habits, social relationships, help-seeking, and self-efficacy. Results of the study indicated that age, feelings of self-confidence, and basic student responsibilities were associated

with success in college (as measured by grade point average). More specifically, older students with AD/HD were found to be more successful than younger students with AD/HD, higher self-confidence was related to greater success, and the ability to plan and follow a sequenced schedule of activities contributed to students' success. The study also found that AD/HD students with additional learning disabilities were no more or less successful than other AD/HD students.

In another study, Richards, Rosen, and Ramirez (1999) examined psychological functioning differences among students with confirmed AD/HD, AD/HD by self-report only, and students without AD/HD. Participants were male and female undergraduates (N=193) from introductory psychology courses at a large university in the western United States. A brief symptom self-report screening form developed for the study was used to measure AD/HD symptoms for inclusion in the study, the AD/HD Behavior Checklist for Adults (Murphy & Barkley, 1995) and the Wender Utah Rating Scale (Ward, Wender, & Reimherr, 1993) were used to assess AD/HD symptoms within the past six months and during childhood. In addition, self-report measures of psychological symptoms were used to assess psychopathology and delinquent behaviors.

Results of the study indicated that college students with confirmed and self-reported AD/HD scored higher on scales of psychopathology than students without AD/HD. A primary limitation of the study was its small sample size for the confirmed AD/HD ( $n = 29$ ) and self-reported AD/HD ( $n = 18$ ) groups. In addition, discrepancies were found between scores on the diagnostic measures for the self-reported AD/HD and the confirmed AD/HD groups. The authors emphasize that this discrepancy highlights the problem with using self-report measures of AD/HD symptoms without a confirmed

diagnosis of AD/HD in studying college students with AD/HD (Richards & Ramirez, 1999).

Another study conducted by Turnock, Rosen, and Kaminski (1998) examined differences in academic coping strategies of college students who self-reported high and low symptoms of AD/HD. Participants were 151 undergraduate students enrolled in introductory psychology classes at a large university in the western United States. A brief symptom screening self-report measure was used to assess AD/HD symptomatology for inclusion in the study. Degree of AD/HD symptomatology was measured with Barkley's (1991) Adult AD/HD Symptom Checklist with cutoff scores for high and low symptomatology based on previous research (Liftin, 1996). Academic success was measured by each participant's GPA for the semester in which they participated in the study, and coping self-report measures were used to assess academic coping.

Results of the study indicated that college students with high levels of AD/HD symptomatology and students with low levels of AD/HD symptomatology differ in their use of academic coping strategies. AD/HD symptom level was found to have the strongest association with the academic coping strategies of the students. More specifically, in comparison with students with low AD/HD symptom levels, students with high levels of AD/HD symptoms were less organized and methodical in their studying, procrastinated more, and employed fewer self-disciplinary behaviors. In addition, students with high levels of AD/HD symptoms achieved significantly lower grades and dropped out of classes more often than students with lower AD/HD symptom levels. The authors highlighted that the findings are consistent with previous research on AD/HD elementary and high school students (Hechtman, 1991; Hechtman et al., 1984; Lambert,

1988; Mannuzza et al., 1991; Wilson & Marcotte, 1996) (Turnock & Kaminski, 1998), suggesting trends of higher-than-average school failure and drop-out rates of college students with AD/HD (Turnock & Kaminski, 1998). Limitations of the study included the sole use of self-report data for AD/HD symptoms and diagnosis, and the lack of validated measures for the assessment of academic coping.

In sum, research on late adolescent and adult AD/HD to date has highlighted that AD/HD is complex disorder with biological, psychological and social consequences that potentially interfere with many aspects of adaptive functioning. Furthermore, research has highlighted the need to examine multiple biopsychosocial factors associated with outcomes for AD/HD individuals. Overall, there is a paucity of research on college students with diagnosed AD/HD. While research has highlighted the uniqueness of the college AD/HD population given their level of academic and psychosocial success in being admitted to college, little research has examined the relationship of psychosocial resources to health status outcomes and the adaptation of AD/HD students in the context of the college environment. Very little is known about factors related to positive health status outcomes in college students with AD/HD. While some research has begun to examine various predictors of outcomes for college students with AD/HD, a conceptual framework has yet to be applied to examine multiple biopsychosocial factors, including personal and psychosocial resources, related to health status outcomes for the AD/HD college student population.

This study applied the biopsychosocial model of health status (Hoffman & Driscoll, 2000) to address such gaps in the literature and to examine multiple biomedical and psychosocial factors associated with general and domain-specific health status

outcomes (e.g., subjective well-being and college adjustment) of students with diagnosed AD/HD. The biopsychosocial model of health status (Hoffman & Driscoll, 2000) was selected as an applicable conceptual framework for this study for a number of reasons.

First, the biopsychosocial model of health status seemed highly applicable for examining the AD/HD college population given that AD/HD is a neurobiological condition that has been empirically demonstrated to be associated with many areas of psychological and social functioning in late adolescents and young adults, including students in the college context (Quinn, 1996).

Furthermore, much of the research to date on AD/HD has been limited to examining individual predictors and long-term follow-up studies assessing psychosocial and behavioral outcomes of adolescents with AD/HD diagnosed in childhood (Barkley et al., 1991). Adult outcome studies of AD/HD individuals have highlighted the complexity of AD/HD and the need to examine multiple factors related to outcomes for individuals with AD/HD, including college students with AD/HD. The biopsychosocial framework allowed such an exploration of the complexity of AD/HD in the college setting, including the association of multiple biomedical and psychosocial factors to health status outcomes, including the subjective well-being and college adjustment of students with diagnosed AD/HD.

Overall, the biopsychosocial model of health status lent itself to exploring the complexity of AD/HD by providing a conceptual framework for simultaneously examining multiple factors associated with broadly defined health status outcomes (e.g., subjective well-being and college adjustment) of students with AD/HD. Having discussed the relevance of the biopsychosocial model of health status, the next section



discusses the model in more detail, outlining some important biomedical, psychological, and social factors that were hypothesized to be related to the subjective well-being and college adjustment of students with AD/HD, based on findings relevant to the AD/HD college student literature.

### *The Biopsychosocial Model of Health Status*

In recent years, there has been a major shift in the conceptualization of human health and illness (Bandura, 1997). Whereas traditional approaches have relied primarily on a biomedical model, placing primary emphasis on biological and medical factors related to disease outcomes, newer approaches emphasize the important role of psychological and social factors associated with health status and positive adjustment outcomes (Bandura, 1997).

Engel's (1977, 1980) biopsychosocial model was among the first to systematically incorporate psychosocial factors in combination with biomedical factors in predicting disease outcomes (Hoffman & Driscoll, 2000). The premise of Engel's original model is that disease outcomes are determined by multiple biomedical, psychological, and social factors. These elements are organized into hierarchical units, each representing a system with distinct qualities, yet each also having an effect on the total system (Hoffman & Driscoll, 2000).

Building on Engel's (1977, 1980) model Hoffman and Driscoll (2000) proposed a biopsychosocial model of health status, highlighting that *health status* is not simply the presence or absence of physical disease, but "also includes psychological well-being, resulting from perceptions, skills, and psychosocial resources that individuals use to adapt to physical, emotional, and interpersonal challenges throughout the lifespan"

(p.532). Unlike Engel's model, which posits that biological, psychological, and social factors interact to cause disease and deficits, Hoffman and Driscoll's (2000) biopsychosocial model posits that these same factors can lead to positive health outcomes, as well as negative ones (p.532). Within this model, "health status" is a broadly defined term, reflecting the continuum of health outcomes related to the effects of multiple domains (biological, psychological, and social) that contribute to health outcomes, including psychological and behavioral health.

Rather than being organized in hierarchical units, the biopsychosocial model of health status is based on concentric circles with health status at the center, reflecting the view that health status outcomes result from ongoing, developmental, biopsychosocial processes (Hoffman & Driscoll, 2000). Within the biopsychosocial model, health status is considered a dynamic process that requires ongoing adaptation to biological, psychological, and social challenges throughout life (Hoffman & Driscoll, 2000). Moreover, within the biopsychosocial model, psychosocial factors can be either important consequences of health status or contributing factors (Hoffman & Driscoll, 2000). Moreover, psychosocial factors can affect health and adjustment outcomes either directly, or indirectly through mediational or moderational processes (Hoffman & Driscoll, 2000).

With the development of the biopsychosocial model, there has been a rise in research on the role of psychological and social factors in disease acquisition, prevention, and progression (Hoffman & Driscoll, 2000). Furthermore, research is increasingly demonstrating the importance of psychological factors, such as personality traits, on the well-being and adjustment outcomes of individuals (Hoffman & Driscoll, 2000). In

addition, social factors, such as support from friends, family, and the community are being increasingly recognized as playing an important role in affecting health status and adjustment outcomes of individuals with chronic illnesses and a variety of medical conditions (Hoffman & Driscoll, 2000).

Utilizing the biopsychosocial framework (Hoffman & Driscoll, 2000), multiple biopsychosocial variables were examined in this study in relation to the subjective well-being and college adjustment of students with diagnosed AD/HD. Having reviewed the conceptual framework that served as the foundation for this study, the following section outlines the important biomedical, psychological, and social factors hypothesized in this study to be relevant to the subjective well-being and college adjustment of students with AD/HD. These factors are discussed below in the context of the subjective well-being, college adjustment, and AD/HD college student literature.

*Biomedical Factor: AD/HD Symptom Severity*

Within the biopsychosocial model, biomedical contributors to health status and adjustment include variables related to biological processes, physical symptoms and characteristics, and genetics (Hoffman & Driscoll, 2000). The severity of current AD/HD symptoms was hypothesized to be a critical biomedical variable to consider in understanding factors related to the subjective well-being and college adjustment of AD/HD students. More specifically, research has demonstrated that AD/HD symptoms (e.g., inattentiveness, hyperactivity/impulsivity) are directly associated with many aspects of academic and psychosocial functioning in the college setting (Quinn, 1996). *AD/HD symptom severity* is the rating of the degree to which the individual experiences various symptoms of AD/HD. Moreover, the severity of current AD/HD symptoms has been

supported by research to be a significant predictor of outcomes for AD/HD individuals, including college students with AD/HD. For example, Weiss and Hechtman (1993) found current AD/HD symptom levels to be one of the five most predictive factors of adult outcomes in their study. In addition, in the Turnock et al. (1998) study, current AD/HD symptom level was found to be the most consequential in its effect on outcome measures in college students with AD/HD, including student GPA and use of academic coping strategies.

*Psychological Factors: Self-Efficacy and Self-Esteem*

In addition to biomedical factors, the biopsychosocial model highlights the importance of considering psychological and social resources related to health status outcomes (e.g., well-being and adjustment) in the midst of adaptive challenges (Hoffman & Driscoll, 2000). Personal resources include relatively stable personality and cognitive characteristics that shape appraisal and coping processes (Holahan, Moos, & Schaeffer, 1996). A variety of dispositional factors have been demonstrated as especially important personal coping resources (Holahan et al., 1996). For example, extensive literature has demonstrated the importance considering self-efficacy and self-esteem in relation to health status and adjustment outcomes in a variety of populations, including college students.

*Self-efficacy* is an aspect of self-concept that refers to what individuals believe they can do with their skills under certain conditions (Bandura, 1977; Bandura, 1982). Bandura (1986) postulated that self-efficacy differs from other types of appraisal including locus of control, self-concept, and self-esteem. For example, whereas locus of control refers to the degree to which people believe their actions will *produce* desired

outcomes, self-efficacy refers to the degree to which a person believes they can organize their thoughts and behaviors to successfully utilize their skills under various conditions (Bandura, 1986). Furthermore, self-efficacy differs from self-concept and self-esteem. *Self-concept* refers to the variety of roles people ascribe to themselves and *self-esteem* refers to the value people place on a given role. Self-efficacy focuses on the degree of confidence a person has to perform a given behavior, as opposed to the role implied by performing a behavior or the degree of value a person places on a given role (Solberg, O'Brien, Villareal, Kennel, & Davis, 1993).

Self-efficacy theory maintains that self-efficacy beliefs develop through the interaction of a variety of factors, including the development of the capacity for symbolic thought, the capacity for self-observation and reflection, and the responsiveness of environments to attempts at control (Bandura, 1977). Individuals' cognitive and symbolizing capabilities allow them to create internal models of experience and beliefs about their capacities in producing desired effects by their own actions (Maddux, 2000).

Moreover, self-efficacy theory maintains that self-efficacy beliefs play a crucial role in psychological adjustment, psychological problems, and health, as well as professionally and self-guided behavioral change strategies (Maddux, 2000). For example, judgements of self-efficacy determine how much effort individuals will expend and how long they will persist in the face of various obstacles and challenges (Bandura, 1982). Individuals who perceive themselves as inefficacious in coping with environmental demands tend to focus on their personal deficiencies, which create additional stress and impair performance (Bandura, 1982).

Bandura (1982) proposes that there are four primary sources of information which develop efficacy expectations: enactive attainments, vicarious experiences, verbal persuasion, and physiological arousal. *Enactive attainments* are the potentially strongest source of efficacy change and involve mastery experiences. *Vicarious experiences* refer to the impact of witnessing similar others perform a task. People do not rely solely on personal experience for information about their capabilities, but rather form beliefs about their capabilities by watching a similar model perform a task (Bandura, 1982). *Verbal persuasion* involves encouragement to engage in a target behavior by self or others, and people also rely partly on information from their *physiological state* (e.g., level of arousal, adrenalin) in judging their capabilities (Bandura, 1982).

It is generally agreed that a sense of control over one's behavior, environment, thoughts, and feelings is essential for a sense of well-being (Maddux, 2002). Moreover, self-efficacy theory is concerned with understanding the positive aspects of functioning, including *enablement factors*, or the personal resources that allow people "to select and structure their environments in ways that set a successful course for their lives" (Bandura, 1997, p.177). Bandura (1997) particularly emphasizes the importance of self-efficacy beliefs during transitional experiences of adolescence, including educational transitions. Given the many challenges inherent in the transitions of adolescence, particularly those encountered by AD/HD students in the college context, it is important to examine personal resources and sources of enablement that contribute to successful outcomes (Bandura, 1997). Adolescents' beliefs in their efficacy in social and academic areas affect their emotional well-being and development (Bandura, 1997).

Research has demonstrated the important role of self-efficacy beliefs on many aspects of adjustment and well-being. More specifically, research has demonstrated that people with high levels of self-efficacy are more willing to engage in particular behaviors, demonstrate more persistence in domain-specific tasks, and obtain greater domain-specific accomplishments (Bandura, 1982). Russell and Petrie (1992) consider self-efficacy expectations to be an important factor in the promotion of personal adjustment among college students (Solberg & Villareal, 1997). Extensive research has supported the important role of self-efficacy in predicting domain-specific psychosocial and performance outcomes for college students.

For example, Lent, Brown, and Larkin (1986) explored the relation of self-efficacy beliefs to educational/vocational choice and performance in 105 undergraduates in a career planning course on science and engineering fields. The major findings of the study demonstrated that self-efficacy expectations are related to indices of academic performance and behavior and vocational interests and perceived career options (Lent et al., 1986).

In addition, in another study, Lent, Brown, and Larkin (1984) examined the relation of self-efficacy beliefs to college students' persistence and success in pursuing science and engineering college majors. Findings indicated that participants reporting high self-efficacy for educational requirements generally achieved higher grades and persisted longer in technical/scientific majors over the following years than those students with low self-efficacy. Self-efficacy was also moderately correlated with objective predictors of academic aptitude and achievement (Lent et al., 1984).

Furthermore, Solberg and Villareal (1997) investigated whether self-efficacy and social support moderated the relationship between stress, and physical and psychological distress among Hispanic college students. The hypothesis that self-efficacy expectations would have a positive relationship to distress ratings of the students was supported, suggesting that self-efficacy can be considered an important determinant of personal adjustment among college students represented in the sample (Solberg & Villareal, 1997).

Also, Multon, Brown, and Lent (1991) conducted a meta-analysis of the relations of self-efficacy beliefs to academic performance and persistence. The researchers found a moderate effect size of the relationship between college performance and self-efficacy. More specifically, results indicated positive and statistically significant relationships between self-efficacy beliefs and academic performance and persistence outcomes across a wide variety of subjects, experimental designs, and assessment methods (Multon et al., 1991). In addition, across elementary through college school levels, self-efficacy was found to correlate moderately with persistence on a given task ( $r=.34$ ), and to account for 14% of the variance in academic performance and 12% of the variance in academic persistence across all school levels (Multon et al., 1991). Clearly, self-efficacy has been demonstrated to be an influential personality variable and important personal resource predicting psychosocial and performance outcomes for college students.

While extensive research has examined and demonstrated a positive relationship between self-efficacy beliefs and individuals' performance, persistence, and outcome expectations, Bandura (1997) also argues for the importance of self-efficacy in psychological adjustment more broadly, including symptoms of anxiety, depression, and



a general sense of personal agency. Newer areas of research are focusing on the role of self-efficacy beliefs on affective and cognitive states, such as well-being and satisfaction (DeWitz & Walsh, 2002). It is important to note that while general sense of self-efficacy is thought to contribute to many aspects of adjustment and well-being, Bandura (1997) emphasizes that it is important to consider context-specific self-efficacy beliefs as stronger predictors of attainments and adjustment in specific contexts.

*Domain specific self-efficacy* refers to a person's sense of control in influencing outcomes in specific contexts. Bandura (1997) explains that particularized self-efficacy beliefs (i.e., domain-specific self-efficacy beliefs) are most predictive of outcomes in specific contexts because the domain-specific beliefs are what guide which activities are undertaken and how well they are performed. This study will examine the role of college self-efficacy as a type of domain-specific self-efficacy predictive of college adjustment and subjective well-being for AD/HD students in the college context.

*College Self-Efficacy* may be defined as a student's degree of confidence in performing various college-related tasks (Solberg, O'Brien, Villareal, Kennel, & Davis, 1993). Consistent with self-efficacy theory, some research has demonstrated a relationship between college self-efficacy and college adjustment and satisfaction. For example, DeWitz and Walsh, 2002 examined the relationship between three different types of self-efficacy (i.e., college, social, and general self-efficacy) and college student satisfaction. Participants were 312 undergraduate students (61% female and 39% male) enrolled in an introductory psychology course at a large midwestern university. Self-efficacy was assessed using three different measures: (a) the College Self-Efficacy Inventory (CSEI), (b) the Scale of Perceived Social Self-Efficacy (PSSE), and (c) the

Self-Efficacy Scale (SES) (General Self-Efficacy subscale (GSE)). It was hypothesized that all three forms of self-efficacy (i.e., college, social, and general) would be significantly and positively correlated with college student satisfaction. Also, based on Bandura's (1997) assertion that measures of specific behaviors are most predictive of self-efficacy beliefs for those behaviors (i.e., domain-specific self-efficacy), it was hypothesized that college self-efficacy would be most predictive of college satisfaction. Finally, it was hypothesized that individuals scoring higher on measures of self-efficacy would report higher levels of college satisfaction.

Results indicated that all three forms of self-efficacy (i.e., college self-efficacy, social self-efficacy, and general self-efficacy) were positively and significantly related to college satisfaction in the sample. In addition, regression analysis supported the second hypothesis, indicating that college self-efficacy was the most predictive of college satisfaction. Social and general self-efficacy did not account for any additional, unique variance in college satisfaction apart from self-efficacy, supporting Bandura's (1997) proposition that measures of domain-specific self-efficacy are more predictive and descriptive of those particular domains.

Overall, theory and research supports the importance of self-efficacy as a personal resource facilitating many aspects of adjustment and well-being in college students. College self-efficacy, as a form of a domain-specific self-efficacy, has been linked to adjustment, well-being, and satisfaction in college students (DeWitz & Walsh, 2002). Little research has examined the role of self-efficacy as a personal resource related to health status and adjustment outcomes of college students with AD/HD. This study expanded on the current AD/HD college student and self-efficacy literature by examining

the role of college self-efficacy as a personal resource related to the subjective well-being and college adjustment of students with diagnosed AD/HD.

In addition to self-efficacy, self-esteem was hypothesized as another important personal psychosocial resource to consider in examining factors related to the well-being and college adjustment of students with diagnosed AD/HD. *Self-esteem* may be defined as a psychological state of self-evaluation ranging from positive (i.e., self-affirming) to negative (i.e., self-denigrating) (Hewitt, 2002). Researchers have typically been interested in both the antecedents and consequences of self-esteem, including whether higher levels of self-esteem lead to higher levels of individual achievement, happiness, and adjustment (Hewitt, 2002).

Interestingly, findings of the late adolescent and adult AD/HD literature suggest that poor self-esteem may potentially be a unique feature of the longitudinal course of AD/HD (Mannuzza & Klein, 1999; Slomkowski, Klein, & Mannuzza, 1995). For example, while there is a paucity of research specific to college students with AD/HD, some research (Dooling-Litfin, 1997) has indicated that college students with a childhood history of AD/HD report lower levels of self-esteem than the general college population.

For example, Dooling-Litfin (1997) examined differences in self-esteem between college students who indicated a childhood history of AD/HD and college students in general. Factors predictive of self-esteem among the AD/HD students were also examined. Results indicated that college students with a childhood history of AD/HD had lower reported levels of self-esteem than the general college population, even when gender, socioeconomic status, and aptitude test scores were taken into account (Dooling-Litfin, 1997). In addition, greater social skills were positively correlated with self-esteem

in the AD/HD students and negatively associated with current AD/HD symptoms (Dooling-Litfin, 1997).

Similarly, some dissertation studies (Shaw, 2000; Presnell, 2000) have also found lower self-esteem in college students with AD/HD as compared to the general college population. Shaw (2000) assessed aspects of college adjustment and social functioning in a non-referred sample of 21 undergraduate students with AD/HD by comparing them with 20 comparison students who were matched on age, gender, and GPA. It was hypothesized that college students with a diagnosis of AD/HD would report lower levels of college adjustment than students without an AD/HD diagnosis. In addition, students with AD/HD were hypothesized to have lower levels of social skills and self-esteem. Third, it was hypothesized that social skills and self-esteem would mediate the relationship between AD/HD and college student adjustment. Results of the study supported all of the main hypotheses. More specifically, students with AD/HD showed decreased functioning in several areas of college adjustment, as well as lower levels of self-reported social skills and self-esteem. Furthermore, the results suggested that the relationship between AD/HD and college adjustment was partially mediated by reported levels of social skills and self-esteem (Shaw, 2000).

While such research has clearly suggested that college students with AD/HD may be at risk for lower levels of self-esteem as compared to their non-AD/HD peers, few studies have examined self-esteem as a psychosocial resource related to the subjective well-being and college adjustment of students with AD/HD. Self-esteem seemed an important psychosocial resource to consider in examining the subjective well-being and college adjustment of AD/HD individuals given that self-esteem has been found to be a

strong predictor of college adjustment and well-being for learning disabled college students and college students in general (Saracoglu, Minden, & Wilchesky, 2001; Hertel, 2002; Mooney, Sherman, & Lo-Presto, 1991).

For example, Hertel (2002) explored similarities and differences between first-year college students classified as either as first or second generation (i.e., whether their parents attended college or not) and predictors of college adjustment for the entire sample. A sample of 130 first-year students returned surveys at one large midwestern public university. Participant ages ranged from 18 to 19 years ( $M = 18.36$  years) and most students were in their second semester of college at the time of the survey. College adjustment was measured with the Student Adaptation to College Questionnaire (SACQ; Baker & Siryk, 1984; 1989). Social support from friends was measured with the Social support-Friends scale (PSS-Fr; Procidano & Heller, 1983). Self-esteem was measured with the Self-Esteem scale (SES; Rosenberg, 1965). Personal values were measured with the Personal Values Scales-Revised (PVS-R; Scott, 1965), and a demographic questionnaire was developed using the Handbook of Survey Research (Rossi, Wright, & Anderson, 1983). Among other results, self-esteem was found to be one of the most predictive factors of college adjustment for the entire sample. More specifically, self-esteem levels related positively to all measures of college adjustment for the entire sample.

#### *Social Factor: Social Support*

In addition to psychological factors, social support was hypothesized as another important variable to consider in relation to the well-being and college adjustment of students with AD/HD. Research has established that socially supportive relationships

reduce vulnerability to stress and depression and can enhance health and adjustment outcomes (Bandura, 1997). Individuals' satisfaction with their lives, their sense of worthiness, and ability to adapt to challenges and stressors are strongly associated with the quality of their interpersonal relationships and support systems (Bandura, 1997). Coping theory and research has highlighted that social resources can facilitate coping efforts and adjustment by providing emotional support, bolstering self-esteem and self-confidence, and by providing informational guidance that assists in assessing threat and planning coping strategies (Carpenter & Scott, 1992).

Weiss (1974) originally described six different social functions or *provisions* that may be obtained from relationships with others including: *attachment* (emotional closeness from which one derives a sense of security), *social integration* (a sense of belonging to a group that shares similar interests, concerns, and recreational activities), *reassurance of worth* (recognition of one's competence, skills, and value by others), *reliable alliance* (the assurance that others can be counted on for tangible assistance), *guidance* (advice or information), and *opportunity for nurturance* (the sense that others rely upon one for their well-being) (Cutrona & Russell, 1987). Weiss proposed that all six provisions are necessary for individuals to feel supported and avoid loneliness (Cutrona & Russell, 1987).

Social support has consistently been demonstrated by research to be an extremely important component of well-being and adjustment in various contexts, including college adjustment (Cutrona & Russell, 1987; Hays & Oxley, 1986). For example, Damsteegt (1992) examined whether the lack of social provisions were related to loneliness in 60 undergraduates. Participants completed the Revised UCLA Loneliness Scale, the Social

Provisions Scale, and the Intimacy Inventory. Results indicated that the most prominent source of loneliness in the college students in the sample was a lack of an adequate social network. Furthermore, Zea (1995) examined relationships among social support, psychosocial competence, and adaptation among 357 Black, Asian American, Latino, and White college students. Social support and active coping were found to be significant predictors of adaptation to college. Also, Demakis and McAdams (1992) examined the role of social support, extraversion, and intimacy motivation on the well-being of first-year college students. Results of the study indicated that social support had a direct, beneficial effect on well-being in college students in the sample.

While social support has been demonstrated to be an important personal resource predictive of adjustment outcomes of college students in general, it had yet to be examined in terms of its relationship to adjustment outcomes for the AD/HD college student population. Given the many additional challenges inherent in the college context for the AD/HD student, it seemed that personal psychosocial resources such as social support, college self-efficacy, and self-esteem might play an even greater role in adjustment outcomes for this population.

Having discussed the primary biomedical, psychological, and social predictors that were considered within the biopsychosocial framework for this study, the next section will discuss in more depth the general and domain specific health status outcomes (e.g., subjective well-being and college adjustment) that were examined in this study in relation to college students with AD/HD.

### *Overview of the Subjective Well-Being Construct*

This study examined subjective well-being as a general health status outcome of late adolescent and young adult college students (ages 18-25 years) with diagnosed AD/HD. Specific biopsychosocial factors including current AD/HD symptom severity, college self-efficacy, self-esteem, and social support were examined in relation to this construct.

The current health and positive psychology movement has evolved through a variety of historical and sociocultural influences over the years. Ryff and Singer (2000) highlight that the focus on health and well-being has permeated many of the foundations of the field of psychology. For example, in 1948 the World Health Organization defined health as a state of complete physical, mental and social well-being, rather than simply the absence of illness and disease. This movement has evolved into a “new era” of science that focuses on the “biopsychosocial nexus”, or the joining of mind and body, in optimal health and human functioning (Ryff & Singer, 2000).

*Subjective well-being* (SWB) is defined as a person’s cognitive and affective evaluations of his or her life, including emotional reactions to events, as well as cognitive judgements of satisfaction and fulfillment (Diener, Lucas, & Oishi, 2002). More specifically, subjective well-being is considered a tripartite construct consisting of high positive affectivity, low negative affectivity, and life satisfaction (Diener, 1984).

*Affectivity* involves individuals’ moods and emotions resulting from evaluations of events that occur in their lives (Diener & Suh, 1999). *Positive affect* is the degree to which individuals feel alert, enthusiastic, and active and involves a state of elevated energy, concentration, and pleasure (Watson, Clark, & Tellegen, 1988). *Positive*



*affectivity* is a trait that reflects stable individual differences in positive emotional experience. Individuals high in positive affectivity experience frequent and intense pleasant mood, and are generally cheerful, enthusiastic, energetic, confident, and alert (Watson, 2002). In contrast, individuals low in positive affectivity report reduced levels of happiness, excitement, energy, and confidence (Watson, 2002). *Negative affect* involves the extent to which an individual experiences negative emotional states such as fear, anger, sadness, guilt, and contempt (Watson, 2002). *Negative affectivity* is a trait that reflects stable individual differences in negative emotional experience (Watson, 2002).

Interestingly, Watson and Tellegen (1985) emphasize that positive and negative affect are not simply opposite states, but represent distinctive factors. Research (Diener, Smith, & Fujita, 1995) has supported that pleasant and unpleasant affect may be considered two moderately correlated but independent factors that contribute to SWB (Diener & Suh, 1999). In addition to affective reactions, SWB involves individuals' cognitive evaluations of life satisfaction (Diener & Suh, 1999). Diener (1984) explains that life satisfaction involves an individual's overall judgement of his or her life, resulting from the comparison of their current situation to a self-set standard. Therefore, the degree of satisfaction or fulfillment depends in part upon an individual's adaptation and aspirations, influenced by past experiences, comparisons with others, and personal values.

Early research on SWB was limited to examining the various resources and demographic factors associated with SWB. Interestingly, thirty years of research on SWB has indicated that external demographic factors only contribute to a small portion

of the variance in SWB (Diener & Suh, 1999). Personal factors such as temperament and cognitions, goals, and adaptation and coping efforts have been found to significantly moderate the influence of life circumstances and events on SWB (Diener & Suh, 1999).

#### *Overview of the College Adjustment Construct*

In addition to subjective well-being, this study examined overall college adjustment as a domain-specific adjustment outcome for college students with diagnosed AD/HD. For many adolescents, the transition to college is the first time away from many familiar sources of support (Rice, Fitzgerald, Whaley, & Gibbs, 1995). *Adjustment* may be defined as the perceived degree of comfort a person has within his or her environment, and in this study it refers to the environment provided by the college context.

Adjustment to college may be considered a major challenge to the adaptive strategies and coping mechanisms of the late adolescent (Rice et al., 1995). Consistent with coping theory (Lazarus & Folkman, 1984), studies have supported the important role of personal psychosocial resources, including self-esteem, self-efficacy, and social support in predicting college adjustment in college student populations (Saracoglu et al., 1989; Hertel, 2002; Zea, 1995; Demakis & McAdams, 1992).

For example, (Saracoglu, et al., 1989) examined the relationship of self-esteem and self-efficacy to the adjustment of learning disabled (LD) university students. More specifically, participants were 34 university students (24 males and 10 females) registered with York University's Learning Disabilities program and 31 non-learning disabled university students individually matched with LD students on sex, age, and year of study. The mean age of all students was 22 years. All learning disabled students exhibited some form of cognitive/information processing that interfered with their academic

performance, despite their average to above average intellectual potential. The Student Adaptation to College Questionnaire (SACQ; Baker & Siryk, 1989) was used to assess the students' adjustment to various aspects of college life. The Self-Efficacy Scale (Sherer & Maddux, 1982) was used to assess self-efficacy beliefs. Bachman and O'Malley's (1977) 10-item version of the General Self-Esteem Inventory (Rosenberg, 1965) was used to assess general self-esteem. To control for response bias, nine items selected from the Lie Scale of Eysenck's Personality Questionnaire (Junior and Adult) (Eysenck & Eysenck, 1975) were included. Results of the study found that learning disabled students reported significantly poorer self-esteem, academic adjustment, and personal-emotional adjustment than non-learning disabled students. For both groups, self-esteem correlated positively with general self-efficacy and overall college adjustment (Saracoglu & Wilchesky, 1989).

Some studies have examined the college adjustment of students with AD/HD in particular, with results of the studies indicating that AD/HD students are at risk for poorer adjustment in the college context as compared to their non-AD/HD peers (Heiligenstein, Guenther, Levy, Savino, and Fulwiler, 1999; Richards, Rosen, and Ramirez (1999). Furthermore, some studies have examined factors predictive of college adjustment in college students with AD/HD, indicating that a variety of factors including current AD/HD symptomatology, self-esteem, and social skills, may be associated with adjustment and well-being for these students in the college context (Heiligenstein et al., 1999; Turnock et al., 1998).

While research has begun to examine predictors of outcomes for AD/HD adolescents and adults, research has not yet utilized a conceptual framework to

simultaneously explore multiple biomedical and psychosocial factors associated with the subjective well-being and college adjustment of students with diagnosed AD/HD. The present study used a biopsychosocial framework (Hoffman & Driscoll, 2000) to examine the relationship of multiple biopsychosocial factors (including the severity of AD/HD symptoms, college self-efficacy and self-esteem, and social support) to the subjective well-being and college adjustment of this population.

#### *Overall Summary of the Literature Review*

Some of the major themes identified in the literature review suggest that college students with AD/HD may be at risk for a variety of negative and psychosocial difficulties in the college setting. More specifically, college students with AD/HD have been found to report poorer academic functioning, higher drop-out rates, lower self-esteem, greater levels of psychopathology, and poorer social functioning than non-AD/HD students. Factors demonstrated by current research to relate to outcomes for this population include current AD/HD symptomatology, treatment history, age, social skills, and self-confidence. Given the complexity of AD/HD, previous research highlights the need to examine multiple biopsychosocial factors related to outcomes for AD/HD late adolescents and adults. Little research, however, has applied a conceptual framework to simultaneously examine multiple biopsychosocial factors related to well-being and adjustment outcomes of college students with AD/HD. Though a highly applicable framework for exploring multiple biomedical and psychosocial factors related to health status and adjustment outcomes, a biopsychosocial framework has yet to be applied to simultaneously explore multiple biopsychosocial predictors of the subjective well-being and college adjustment of students with diagnosed AD/HD.

In addition, there are a number of methodological limitations inherent in the current literature related to college students with AD/HD. For example, some studies had relied solely on the use of self-report data to determine an AD/HD diagnosis, rather than confirming the AD/HD diagnosis and any other comorbid psychiatric diagnoses or learning disabilities. This may have potentially introduced a variety of confounds including sample participants who may not have actually had an AD/HD diagnosis based on DSM-IV criteria. In addition, sample sizes were limited in some studies given the number of variables and analyses. Therefore, the present study attempted to address a number of these issues as will be described next.

## Chapter 3

### *Statement of Problem*

In an attempt to address some of the theoretical and methodological limitations of the current AD/HD college student literature highlighted by the review, the primary goal of the present study was to simultaneously examine multiple biopsychosocial correlates of the subjective well-being and college adjustment of students with diagnosed AD/HD. This study utilized a biopsychosocial framework to examine potential factors associated with general and domain-specific health status outcomes (e.g., subjective well-being and college adjustment) of this population of college students. Also, given that theory and research (Bandura, 1997; Cutrona & Troutman, 1986; Shaw, 2000; Major, Cozzarelli, Sciacchitano, Testa, & Mueller, 1988) supported a mediating role of self-efficacy and self-esteem in the relationship between social support and well-being and adjustment outcomes in a variety of populations, this study also examined the mediating role of self-efficacy and self-esteem in the relationship between social support and health status outcomes (e.g., subjective well-being and college adjustment) for students with diagnosed AD/HD. Five main hypotheses were investigated, in addition to seven exploratory questions.

#### *Main Hypotheses*

*Hypothesis 1a.* AD/HD symptom severity, defined as the severity of current inattentive and/or hyperactive/impulsive symptoms, will be negatively related to subjective well-being.

*Hypothesis 1b.* AD/HD symptom severity will be negatively related to overall college adjustment.

*Hypothesis 2a.* College self-efficacy, defined as the student's degree of confidence in performing various college-related tasks, will be positively related to subjective well-being.

*Hypothesis 2b.* College self-efficacy will be positively related to overall college adjustment.

*Hypothesis 2c.* Self-esteem will be positively related to subjective well-being.

*Hypothesis 2d.* Self-esteem will be positively related to overall college adjustment.

*Hypothesis 3a.* Social support will be positively related to subjective well-being.

*Hypothesis 3b.* Social support will be positively related to overall college adjustment.

*Hypothesis 4a.* The biomedical factor (AD/HD symptom severity) and psychosocial factors (college self-efficacy, self-esteem and social support) will significantly contribute to the variance of subjective well-being, with the psychosocial factors contributing above and beyond the effects of the biomedical factor.

*Hypothesis 4b.* The biomedical factor (current AD/HD symptom severity) and psychosocial factors (college self-efficacy, self-esteem, and social support) will significantly contribute to the variance of college adjustment, with the psychosocial factors contributing above and beyond the effects of the biomedical factor.

The rationale for predicting that the psychosocial factors would contribute to the dependent variables above and beyond the effects of the biomedical factor was derived from studies indicating that personality and psychosocial factors may be more influential on subjective well-being than are biomedical or demographic variables (DeNeve &

Cooper, 1998). Given the limited value that biological and demographic variables such as gender, age, socioeconomic status, marital status, and physical health have in predicting subjective well-being, researchers have increasingly shifted their attention in the last decade to the role of a variety of psychosocial factors in predicting health and adjustment outcomes (DeNeve & Cooper, 1998).

*Hypothesis 5a.* College self-efficacy and self-esteem will partially mediate the relationship between social support and subjective well-being.

*Hypothesis 5b.* College self-efficacy and self-esteem will partially mediate the relationship between social support and college adjustment.

The rationale for predicting that college self-efficacy and self-esteem would partially mediate the relationship between the social support variable and the health status outcomes was derived from coping and self-efficacy theory and research (Bandura, 1997). For example, various forms of social support, such as encouragement and reassurance of one's worth may be considered a form of verbal persuasion and contribute to self-efficacy and self-esteem (Cutrona & Russell, 1987). According to Bandura (1977; 1982), judgments of self-efficacy affect one's willingness to persist in the face of challenges. Therefore, if social support can enhance people's beliefs in their abilities and sense of worth, it may facilitate effective adjustment and well-being through the mediation of self-efficacy and self-esteem (Cutrona & Russell, 1987). Research has demonstrated that a sense of self-efficacy mediates the relationships between social support and affective states, well-being, and adjustment in a variety of populations, including college students (Bandura, 1997; Cutrona & Troutman, 1986; Major, Cozzarelli, Sciacchitano, Testa, & Mueller, 1990; Shaw, 2000). The potential mediating



effects of self-efficacy and self-esteem in the relationship between social support and health outcomes had yet to be examined in the AD/HD college student population.

### *Exploratory Questions*

Along with the main hypotheses proposed in the present study, a number of exploratory questions were addressed, which were as follows:

*(1) Is there a relationship between year in school and college adjustment for college students with AD/HD?*

*(2) Is there a relationship between gender and subjective well-being for college students with AD/HD?*

*(3) Is there a relationship between gender and college adjustment for college students with AD/HD?*

*(4) Are there differences in levels of subjective well-being among students with an AD/HD and comorbid specific LD diagnosis, an AD/HD and comorbid psychiatric mood disorder, and students with an AD/HD diagnosis alone?*

*(5) Are there differences in levels of overall college adjustment among students with an AD/HD and comorbid specific LD diagnosis, an AD/HD and comorbid psychiatric mood disorder, and students with an AD/HD diagnosis alone?*

*(6) Are there differences in levels of AD/HD symptom severity among students with an AD/HD and comorbid specific LD diagnosis, students with an AD/HD and comorbid psychiatric mood disorder, and students with an AD/HD diagnosis alone?*

*(7) Are there differences in levels of self-esteem and college self-efficacy among students with an AD/HD and comorbid specific LD diagnosis, students with an AD/HD and comorbid psychiatric mood disorder, and students with an AD/HD diagnosis alone?*

With regard to the first exploratory question, it seemed logical to assume that AD/HD students who have been in the college environment longer, have had more time to adjust, and have successfully advanced to higher grade levels will report higher levels of college adjustment than students at lower grade levels. While research had not yet examined differences in the college adjustment and well-being of AD/HD students based on year in school, some research (Wallace, Winsler, & NeSmith, 1999) had indicated such differences in college students with AD/HD based on age. With regard to the second and third exploratory questions, some research (Arcia & Conners, 1998) had indicated gender differences in adjustment and functional status of children and adults with AD/HD. With regard to the fourth and fifth exploratory questions, some research had indicated that the presence of comorbid specific learning disorders and/or comorbid psychiatric mood disorders place individuals with AD/HD at greater risk for poorer adjustment outcomes than those without comorbid conditions (Frick et al., 1991; Hinshaw, 1992). These questions explored potential differences in subjective well-being and college adjustment among diagnostic subgroups in the sample (e.g., among students with combined AD/HD and specific LD, combined AD/HD and psychiatric diagnosis, and AD/HD alone). Finally, the sixth and seventh exploratory questions attempted to examine potential confounding effects of comorbid conditions by exploring potential differences in levels of the biomedical and psychological predictor variables based on comorbid diagnostic status.

## Chapter 4

### *Method*

#### *Design*

This study used a descriptive, nonexperimental, correlational design to examine the relationships between multiple biopsychosocial factors (i.e., severity of current AD/HD symptoms, college self-efficacy, self-esteem, and social support) and the subjective well-being and college adjustment of students with diagnosed AD/HD.

#### *Participants*

A sample of 80 participants for this study was obtained. Based on Wampold and Freund (1987) a sample size of 80 was adequate in terms of effect size and power given the number of independent variables and analyses considered the present study. The sample consisted of college students who met the criteria for this study (e.g., undergraduates between the ages of 18 and 25, enrolled in the database at the University of Maryland Learning Assistance Service and/or Disability Support Service with diagnosed AD/HD). While the exact percentage of students with diagnosed AD/HD on campus who actually register with the Learning Assistance/Disability Support Service is unknown because not all students with AD/HD register with LAS/DSS, the number of students that were registered (e.g., 242 students out of an overall undergraduate student body of approximately 20,000) approximated the estimated prevalence rates of AD/HD among college students (e.g., 0.8%) based on mathematical extrapolation from existing studies conducted by previous researchers (Hill & Schoener, 1996) (Turnock, Rosen, & Kaminski, 1998), supporting the comprehensiveness of the sampling pool. Approximately 33% of the potential participants (80 out of 242 students) with diagnosed

AD/HD that were registered with Disability Support Services during the time of data collection participated in this study.

### *Demographic Questionnaire*

Demographic information was collected by using a questionnaire designed for this study. The questionnaire asked participants to provide the following information about themselves: (a) age; (b) gender; (c) race/ethnicity; (d) current major; (e) transfer status; (f) current class year; (g) whether they live on or off campus; (h) specific type of living situation if off-campus; (i) diagnoses; (j) age of diagnoses; (k) age began receiving services for AD/HD; (l) the use and frequency of use of medication to manage AD/HD symptoms; (m) sources of personal and academic support; and (n) the frequency and level of support provided by different sources, including parents, friends, faculty/academic advisors, and learning assistance and disability support services on campus.

### *Biomedical Measure*

*Severity of current AD/HD symptoms measure.* The severity of current AD/HD symptoms was assessed using Adult ADHD Current Symptoms Scale (Barkley & Murphy, 1998). The scale contains the 18 symptom items for AD/HD adapted directly from the DSM-IV in the form of a self-report rating scale. Nine items pertained to inattentive symptoms and nine items pertained to the hyperactive-impulsive symptoms of AD/HD. Respondents rated the degree to which they experience each of the AD/HD symptoms ranging from 0 (*never or rarely*) to 3 (*very often*). Examples of items from the inattentive subscale included, “Fail to give close attention to details or make careless mistakes in my work” and “Have difficulty organizing tasks or activities.” Items from

the hyperactivity-impulsivity subscale included, “Fidget with hands or feet or squirm in seat” and “Feel ‘on the go’ or ‘driven by a motor.’” The severity of current AD/HD symptoms was obtained by adding the ratings for each of the items and obtaining a total current AD/HD symptoms score, where a higher total AD/HD symptoms score indicated greater current AD/HD symptom severity than a lower total AD/HD symptoms score. Previous research has used the 18-item rating scale to assess current AD/HD symptomatology, and has supported the applicability of DSM-IV AD/HD criteria to college students (DuPaul, Schaughency, Weyandt, Tripp, Kiesner, Ota, & Stenish, 2001; Turnock et al., 1998). The internal consistency of the AD/HD symptoms measure was found to be good for the current sample (Cronbach’s  $\alpha = .89$ ).

### *Psychological Measures*

*College self-efficacy measure.* College self-efficacy was assessed using the College Self-Efficacy Instrument (CSEI; (Solberg et al., 1993). The CSEI consists of 20 items related to different areas of college life (i.e., courses, roommates, and social situations), assessing an individual’s sense of perceived college self-efficacy (Solberg, O’Brien, et al., 1993). Items were originally selected from various academic self-help books. The CSEI was validated using a sample of 164 Mexican-American and Latino-American college students who responded to a survey questionnaire (Solberg et al., 1993). Principal components analysis of the CSEI yielded three subscales: course efficacy (e.g., writing papers, doing well on exams), social efficacy (e.g., talking with professors, making friends at the university), and roommate efficacy (e.g., socializing with roommates, dividing apartment space) (Solberg et al., 1993). The principal components analysis indicated that the CSEI possesses adequate construct validity

(Solberg et al., 1993). In terms of reliability, internal consistency estimates were found to be .88 for each subscale and .93 for the total score (Solberg et al., 1993). The internal consistency of the CSEI was found to be sufficient for the sample in this study (Cronbach's alpha = .90).

Item responses on the CSEI are obtained using an 10-point Likert-type scale ranging from 0 (*not at all confident*) to 9 (*extremely confident*), asking the respondent to indicate their level of confidence in performing college tasks such as "Write course papers", "Get along with roommates", "Ask a question in class", and "Make new friends at college." Total scores of college self-efficacy are obtained on the CSEI by summing the 20 items, with higher total scores reflecting a greater sense of college self-efficacy. Though validated on a sample of Hispanic and Latino college students, the CSEI items were designed to address experiences common to all college students to allow future research to have the flexibility to address college self-efficacy both within Hispanic and non-Hispanic cultures (Solberg et al., 1993).

*Self-esteem measure.* The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) was used as a measure of self-esteem. The RSES is a widely used measure of self-esteem consisting of ten items designed to measure positive or negative attitudes toward oneself (Rosenberg, 1965). Participants were asked to indicate whether they "strongly agree", "agree", "disagree", or "strongly disagree" with each of the items. There are five positively keyed items and five negatively keyed items. Examples of items included: "At times I think I am no good at all", "I certainly feel useless at times", and "I take a positive attitude towards myself." Higher total scores indicate higher self-esteem lower total scores indicate lower self-esteem. The scale was originally normed on a sample of 5,024

high school juniors and seniors (Rosenberg, 1965). Multiple studies have been conducted supporting the reliability and validity of the RSES (Rosenberg, 1965; Silbert & Tippett, 1965; Kaplan & Pokomy, 1969; Crandal, 1973; McCarthy & Hodge, 1982; Goldsmith, 1986; Shahani, Dipboye, & Philips, 1990; Hagborg, 1993). The scale generally has high reliability, with test-retest correlations typically ranging from .82 to .88, and Cronbach's alpha for various samples ranging from .77 to .88 (Rosenberg, 1986). The test-retest reliability with college students is .85 (Rosenberg, 1965). Furthermore, Rosenberg (1965) reported the internal consistency reliability of the RSES ranging from .85 to .88 with college samples. The internal consistency of the RSES was found to be sufficient for the sample in this study (Cronbach's alpha = .84). The construct and convergent validity of the measure has been established in a variety of studies (Rosenberg, 1965; Silbert & Tippett, 1965; Kaplan & Pokomy, 1969; Crandal, 1973; Hagborg, 1993), and the scale correlates highly with measures of depressive affect and psychological indicators of anxiety (Johnson, 1976).

#### *Social Support Measure*

Social support was assessed using the Social Provisions Scale (SPS; Cutrona & Russell, 1987). Based on the provisions of social relationships described by Weiss (1974), Cutrona and Russell (1987) proposed that there are a number of different provisions of social support. More specifically, the SPS was developed to assess six provisions of social relationships: attachment (perceived emotional closeness and security); social integration (perceived belonging to a group of people with shared interests and recreational activities); reassurance of worth (perceived acknowledgement by others of one's competence); reliable alliance (perception that one can count on others

for tangible assistance); guidance (perception that one will receive advice and information from others if desired); and opportunity for nurturance (perceived responsibility for the well-being of another person) (Cutrona & Russell, 1987). Though the sixth provision does not involve receiving direct social support, it assesses one's perceived sense of providing support and feeling necessary to another individual, which may lead to some of the same beneficial effects as other kinds of support, particularly in enhancing self-esteem (Mallinckrodt, 1992).

Each provision is assessed by four questions, with a total of 24 items on the SPS. Examples of items include: "There are people I can depend on to help me if I need it" and "I lack a feeling of intimacy with another person." Respondents are instructed to think about their current relationships (i.e. with family, friends, coworkers, and/or community members). Respondents rated their agreement with each item along a 4-point scale ranging from 1= strongly disagree to 4= strongly agree. Negative items were reversed, and a total score was calculated with higher scores indicating greater social support. Total scores can range from 24 to 96, with higher scores indicating greater social provision.

The internal consistency for the SPS is high, ranging from .85 to .92 across different populations, and the scale correlates well with other measures assessing satisfaction with interpersonal relations (Russell & Cutrona, 1984; Cutrona, 1986). The internal consistency of the SPS was found to be good for the sample in the present study (Cronbach's alpha = .93). The convergent and divergent validity of the SPS has been established in studies with samples of college students (Cutrona & Russell, 1987).



### *Dependent Variables Measures*

*Life satisfaction measure.* Global life satisfaction was measured using the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985). The SWLS is a 5-item scale measure of life-satisfaction as a cognitive-judgmental process. Participants respond to items on a 7-point Likert scale, ranging from strongly disagree (1) to strongly agree (7). Total scores on the SWLS range from 5 to 35, with higher scores indicating greater life satisfaction. Examples of items include: “I am satisfied with my life” and “If I could live my life over, I would change almost nothing.”

The SWLS has been supported as a valid and reliable scale for measuring life satisfaction (Diener & Suh, 1999). In an initial study, Diener (1985) obtained an alpha coefficient of .87 and a 2-month test-retest correlation coefficient of .82. The internal consistency of the SWLS was found to be sufficient for the sample in the present study (Cronbach’s alpha = .88). In addition, in a validation test with college students, the SWLS was correlated with 11 other measures of subjective well-being. The authors (Diener et al., 1985) found moderately strong correlations with all of the measures except a measure of the intensity of emotional experience. Furthermore, in another validation study with elderly participants, the SWLS correlated moderately ( $r = .43$ ) with interviewer estimates of life satisfaction (Diener et al., 1985). Moreover, scores on the Marlowe-Crowne Social Desirability Scale were non-significantly correlated ( $r = .02$ ) with scores on the SWLS.

*Positive and negative affect measure.* Positive and negative affect of participants were measured with the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988). This measure consists of two 10-item mood scales of positive and

negative feelings. Respondents rate the extent to which they have felt the emotion for a certain time period ranging from slightly/not at all (1) to extremely (5). Items from the negative mood scale include “irritable”, “nervous”, “afraid”, and “guilty”. Items from the positive mood scale include “enthusiastic”, “excited”, “proud”, and “inspired”.

Researchers using the PANAS select the appropriate time instructions to include in the study from different time periods empirically tested by the authors (e.g., in general, during the past year, during the past few weeks, week, past few days, today, moment). In this study, participants will be asked to respond based on how they have felt during the past few weeks. Each scale is summed separately, yielding two scale scores. High scores on the Positive Affect (PA) scale indicate strong positive feelings, whereas high scores on the Negative Affect (NA) scale indicate strong negative feelings. Each scale yields a total score from a range between 10 and 50.

The internal consistency and test-retest reliability coefficients for the two PANAS scales are adequate. Watson et al. (1988) reported alpha coefficients of .88 and .87 for the PA and NA scales respectively, and test-retest coefficients of .68 and .71 at an 8-week retest interval for the PA and NA scales respectively. The internal consistency of the PANAS was found to be adequate for the sample in this study (PA Cronbach’s alpha = .83; NA Cronbach’s alpha = .84).

Regarding convergent validity, Watson et al. (1988) found the PANAS scale related favorably with four other brief affect measures (i.e., Diener & Emmons, 1984; McAdams & Constantian, 1983), demonstrating relatively strong correlations ( $r = .76$  to  $r = .92$ ) with the appropriate factor, but non higher than the corresponding values for the PANAS. Furthermore, in terms of construct validity, the NA and PA scales correlated at

predicted levels with measures of related constructs, such as the Beck Depression Inventory ( $r = .58$  for NA;  $r = -.36$  for PA) and Hopkins Symptom Checklist ( $r = .74$  for NA and  $r = -.19$  for PA).

*Aggregate subjective well-being measure.* Consistent with past research, subjective well-being was represented by the primary components of life satisfaction, positive affect, and negative affect (Andrews & Withey, 1976; Diener, 1984, 1994; Sheldon & Elliott, 1999). As other researchers have done (e.g., Brunstein, 1993; Sheldon & Elliott, 1998), an aggregate subjective well-being measure was created by standardizing the PA, NA, and SWLS scores, then subtracting the NA scores from the sum of PA and SWLS scores. This procedure is consistent with the idea that a single factor underlies measures of both satisfaction and affective well-being (Diener, 1994). These scales were combined to form a total score of subjective well-being based on the theoretical premise (Diener, 1994) that these three components comprise the subjective well-being construct.

*College adjustment measure.* Adjustment to college was assessed using the Student Adaptation to College Questionnaire (SACQ; Baker & Siryk, 1989). The SACQ is a 67-item self-report for college freshmen, designed to assess student adjustment to college. The SACQ is a self-report instrument designed to measure student adjustment to college. The SACQ is a 67-item, two page questionnaire that is divided into four subscales, measuring four facets of college adjustment: Academic Adjustment (24 items), Social Adjustment (20 items), Personal-Emotional Adjustment (15 items), and Goal Commitment-Institutional Adjustment (15 items). Student responses are marked and scored on a 9-point scale from (1) *doesn't apply to me at all* to (9) *applies very*

*closely to me.* The questions focus on the quality of the student's adjustment to the college environment. The SACQ results in five basic scores: The Full Scale score (all 67 items) and the four subscale scores. For all of the SACQ indices, the higher the score, the better the self-assessed adjustment to college.

Norms for the SACQ were derived from data collected at Clark University, where students were tested in the fall and spring semesters for academic years 1980 to 1984. Baker & Siryk (1989) report desirable internal consistency and reliability properties for the SACQ. Coefficient alpha values range from .81 to .90 for the Academic Adjustment subscale, from .83 to .91 for the Social Adjustment subscale, from .77 to .86 for the Personal-Emotional Adjustment subscale, from .85 to .91 for the Attachment subscale, and from .92 to .95 for the Full Scale. The internal consistency of the SACQ was found to be good for the sample in the present study (Cronbach's alpha = .92). Administration of the questionnaire takes 20 minutes (Mental Measurements Yearbook, 1989). Due to copyright considerations, a copy of the SACQ is not provided in the appendix of this document.

In terms of the validity of the SACQ, principal components analysis revealed that each of 34 administrations at 21 different colleges and universities showed a significant loading, as was predicted for each variable. The criterion-related or construct validity has been established in a variety of studies with college students where the relationship between the SACQ scales and independent real-life behaviors and outcomes were examined. Significant positive correlations (.17 to .53,  $p < .01$ ) were found between Academic Adjustment and grade point average. The evidence to support the Social Adjustment scale is modest. There were significant negative correlations (-.23 to -.34,  $p$

< .01) between the Personal Emotional Adjustment subscale and whether students had made contact with a campus psychological service center during their freshman year.

### *Procedures*

As part of the standard procedures for the University of Maryland Disability Support Services (DSS), a subdivision of the University of Maryland Counseling Center, students with AD/HD who present to DSS requesting accommodations and services are required to provide documentation verifying their diagnosis and need for services to the Learning Disabilities Coordinator and/or the director of the service. Documentation is reviewed to confirm diagnostic status, recency of the documentation, and the need for and type of appropriate services and/or accommodations. More specifically, documentation is reviewed to determine that it meets the following guidelines: (a) that it is recent (e.g., has been generated and/or updated preferable within the past three years; (b) that it provides a list of the questionnaires, interviews, and observations used to identify the AD/HD behaviors; (c) that it includes information regarding the onset, longevity, and severity of the symptoms; (d) that it is a complete psychoeducational evaluation including a cognitive assessment and an achievement assessment with a report of raw data and the interpretation of the data; (e) that it provides information concerning the impact of the students' AD/HD on the educational setting, including functional limitations; (f) that it provides medication history and current recommendation regarding medication; (g) that the diagnosis of AD/HD meets DSM-IV criteria; (h) that it provides a list of appropriate recommended accommodations; and (i) that it provides information concerning comorbidity (e.g., when various learning and/or psychiatric conditions occur in conjunction with one another, they are referred to as *comorbid* conditions). Moreover,

documentation guidelines stipulate that the diagnosis of AD/HD should be made by a professional such as a psychiatrist, educational psychologist, neurologist, or a combination of such professionals who have expertise in diagnosing AD/HD in adults and who have expertise in diagnosing other psychiatric disorders which might resemble symptoms of AD/HD, and that the diagnostician be able to screen for learning disabilities.

Once documentation is reviewed, students' names, addresses, diagnoses, and services requested are entered into the main DSS database. This researcher obtained permission from the Learning Disabilities Coordinator to use the database for the purposes of the present study, and mailed survey packets to the 242 students in the database with diagnosed AD/HD (e.g., using printed labels from the database) at the beginning, middle, and end of two Fall and one Spring semesters over the course of an academic year and a half. More specifically, the researcher sent the first set of packets three weeks into the Fall semester (to make sure that first-year students had been in the college environment for at least some time and to have had some experience with academic assignments), one week after mid-term examinations (to limit the confounds of additional stress and anxiety of the pre-midterm period) and two weeks before the end of the semester (to allow students time to complete and return packets). In an effort to increase the participation rate, this researcher also provided the Learning Disabilities Coordinator with approximately thirty survey packets to distribute over the course of the three semesters to students when they came in to meet with her (e.g., to give to those who had not already participated in the study). The number of students who were actually handed packets by the Learning Disabilities Coordinator and who then returned

completed surveys is unknown. Given the total number of participants in the present study, however, it can be said that the majority of the participants in this study were students who had received the packet by mail.

Each packet contained an introduction letter, consent form, instructions, demographic sheet, an incentive (\$5.00 for a completed packet, and a chance to be entered into a raffle for a \$50 prize if a completed packet was returned within two weeks), the measures, and a self-addressed stamped envelope. The demographic sheet was first in all packets, and remaining measures were placed in random order in the packets in order to counterbalance any fatigue and other effects of completing the measures in a particular order. Participants were instructed to read and complete the contents of the packet and return it to this researcher through regular or via campus mail or via the Disability Support Service. When packets were returned, this researcher removed the attached consent form with identifying information before reviewing and entering response data. These data collection and entry procedures were developed to protect the anonymity and confidentiality of the participants, consistent with recommendations from the Human Subjects Committee of the Counseling Center.

In addition to mailing packets to potential participants (e.g., 242 students with AD/HD in the DSS database) at the beginning of the first semester of data collection, packets were re-mailed to potential participants who had not yet participated in the study at the beginning of the following two semesters of data collection. In addition, this researcher sent a follow-up e-mail to potential participants at approximately the middle of each of the three semesters to invite them to consider participating in the study (e.g., each of the students with AD/HD in the database was sent a blind carbon copy (BCC) of this

follow-up e-mail to invite them to consider participating in the study if they had not already participated).



## Chapter 5

### *Results*

This chapter presents the descriptive analyses, reliability analyses, and statistical analyses used in the present study.

#### *Descriptive Analyses*

Eighty undergraduate students with diagnosed AD/HD participated in this study. All of the students were currently registered with the Learning Assistance/Disability Support Service (LAS/DSS) on campus. The age of the students ranged from 18 to 25 years, and the mean age of the students was 20.7 years. Thirty-nine men (48.8%) and 41 women (51.3%) comprised the sample. The majority of participants were Caucasian (86.3%). Five Asian/Pacific Islanders (6.3%), four African-Americans (5%), one Middle-Eastern student (1.3%), and one student whose race was unspecified (1.3%) also participated in the study.

The majority of participants lived off-campus (61.3%), thirty students lived on campus (37.5%), and one student's housing status was unknown. The majority of the students who lived off-campus lived in a house or apartment (either alone or with a roommate) (37.5%), eight of the students who lived off-campus indicated that they lived at home with their parents (10%). Fourteen of the students who lived off-campus (17.5%) did not specify their type of off-campus housing.

A large portion of the students (41.3%) in the sample had transferred from another college or university. Eighteen of the participants were freshman status (22.5%), twenty-five were sophomore status (31.3%), 17 were junior status (21.3%), and twenty (25%)

were senior status. A wide variety of student majors were represented in the sample. The most common majors among the sample included letters and sciences/undecided (16.3%), education/special education (10%), government and politics (10%), humanities (7.5%), math (7.5%), engineering (7.5%), criminal justice (7.5%), and business/marketing (6.3%).

The mean age at which students reported that they been diagnosed with AD/HD was 16.28 years ( $SD = 4.57$  years). The mean age at which students in the sample reported that they began receiving services for AD/HD was 16.67 years ( $SD = 4.45$  years). Regarding diagnostic status, over half of the students (53.8%) in the sample reported that they were diagnosed with AD/HD only. Twenty-six students in the sample (32.5%) reported that they were diagnosed with AD/HD and some form of comorbid learning disability. Eight students (10%) indicated that they were diagnosed with AD/HD and some form of comorbid psychiatric disorder (i.e., anxiety or depression). Three students (3.8%) reported that they were diagnosed with AD/HD, a comorbid learning disability, and a comorbid psychiatric disorder (i.e., anxiety and/or depression).

The majority of participants (76.3%) in the sample indicated that they currently used prescribed medication to help manage their AD/HD symptoms. Among the participants that indicated that they used prescribed medication for AD/HD symptoms, the most common types of AD/HD medications indicated were Adderall (25%), Concerta (17.5%), and Ritalin (20%). Other medications included Dexedrine (7.5%), Strattera (2.5%), Wellbutrin (1.3%), and/or some combination of these medications (1.3%). The remainder of the students who used prescribed medication did not indicate the specific type of medication used.

Also, among participants who indicated that they used prescribed medication to help manage their AD/HD symptoms, the majority (96.4%) indicated that they used medication in conjunction with other forms of more formal personal and academic support (e.g., LAS/DSS services, counseling and/or psychotherapy) in managing academic and psychosocial issues in college life.

Regarding sources of academic support, the majority of participants in the sample (87.6%) indicated that they received at least some academic support from the LAS/DSS services on campus. A large percentage of the sample also indicated that both faculty/academic advisors (78.8%) and parents (78.8%) provided them with at least some academic support. Fifty-three students (66.3%) indicated that friends provided at least some academic support. Twenty-six students (32.5%) indicated that individual and/or group counseling services provided them with at least some academic support. A small percentage of the sample (2.5%) indicated that other unspecified sources provided at least some academic support.

Regarding sources of psychosocial and emotional support, a large majority of the participants in the sample (92.5%) indicated that parents provided them with at least some personal/emotional support. Friends (91.3%) were also indicated as common sources of at least some personal/emotional support among participants in the sample. A good portion of the students indicated that LAS/DSS services (46.3%) and faculty (41.3%) provided them with at least some personal/emotional support. Nineteen students (23.8%) indicated that individual and/or group counseling services provided them with at least some support for personal/emotional issues. A small percentage (6.3%) indicated

that other unspecified sources provided them with at least some personal/emotional support.

### *Reliability Analyses*

The ranges, means, standard deviations, and alpha coefficients were calculated for all measures used in this study. As shown in Table 1, the internal consistency reliability estimates (coefficient alphas) ranged from .83 to .92, suggesting that all scales demonstrated adequate reliability in the present study.

### *Primary Analyses*

*Hypothesis 1a. AD/HD symptom severity, defined as the severity of current inattentive and/or hyperactive/impulsive symptoms, will be negatively related to subjective well-being.*

To test this hypothesis, a zero-order correlational analysis between participants' ratings of their AD/HD symptom severity (as indicated by total scores on the current AD/HD symptoms measure) and subjective well-being (as indicated by participants' aggregate subjective well-being scores) was conducted. As Table 2 indicates, a significant negative correlation was found between AD/HD symptom severity and subjective well-being ( $r = -.41$ ;  $p < .001$ ), supporting the hypothesis.

*Hypothesis 1b. AD/HD symptom severity will be negatively related to overall college adjustment.*

To test this hypothesis, a zero-order correlational analysis between participants' ratings of their AD/HD symptom severity (as indicated by total scores on the current AD/HD

Table 1

*Means, Standard Deviations, Ranges, and Reliability Coefficients for Measured Variables*

Scale	Mean	SD	Range	Coefficient Alpha
AD/HD Symptom Severity	24.2	9.9	3 - 45	.89
College Self-Efficacy	119.8	27.5	47 - 180	.87
Self-Esteem	30.2	5.3	16 - 40	.83
College Adjustment	385.5	67.6	222 - 537	.88
Social support	77.9	12.95	24 - 96	.92
Positive Affect	33.1	6.8	16 - 48	.83
Negative Affect	23.4	7.5	11 - 42	.90
Life Satisfaction	23.6	6.8	9 - 35	.87
*Aggregate Subjective Well-Being	.00	2.17	-5.84 – 8.96	N/A

*N* = 80

AD/HD Symptom Severity – AD/HD Current Symptoms Scale – Self-Report

College Self-Efficacy Scale – College Self-Efficacy Scale

Self-Esteem – Rosenberg Self-Esteem Scale

College Adjustment – Student Adaptation to College Questionnaire

Social Support – Social Provisions Scale

Subjective Well-Being – \*Aggregate Subjective Well-Being (created by standardizing scores of the Positive Affectivity (PA), Negative Affectivity (NA), and Satisfaction With Life Scales (SWLS), and then subtracting the NA scores from the sum of PA and SWLS scores)

symptoms measure) and overall college adjustment (as indicated by total scores on the college adjustment measure) was conducted. As Table 2 indicates, a significant negative correlation was found between AD/HD symptom severity and overall college adjustment ( $r = -.49; p < .001$ ), supporting the hypothesis.

*Hypothesis 2a. College self-efficacy, defined as the student's degree of confidence in performing various college-related tasks, will be positively related to subjective well-being.*

To test this hypothesis, a zero-order correlational analysis between participants' ratings of their college self-efficacy (as indicated by total scores on the college self-efficacy measure) and participants' subjective well-being (as indicated by participants' aggregate subjective well-being scores) was conducted. As Table 2 indicates, a significant positive correlation was found between college self-efficacy and aggregate subjective well-being ( $r = .50; p < .001$ ), supporting the hypothesis.

*Hypothesis 2b. College self-efficacy will be positively related to overall college adjustment.*

To test this hypothesis, a zero-order correlational analysis between participants' ratings of their college self-efficacy (as indicated by total scores on the college self-efficacy measure) and participants' overall college adjustment (as indicated by participants' total scores on the college adjustment measure) was conducted. As Table 2 indicates, a significant positive correlation was found between college self-efficacy and overall college adjustment ( $r = .63; p < .001$ ), supporting the hypothesis.

Table 2

*Zero-Order Correlations Between Measured Variables*

	AD/HD Symptom Severity	College Adjustment	College Self- Efficacy	Aggregate Subjective Well-Being	Self-Esteem	Social support
AD/HD Symptom Severity	1.0					
College Adjustment	-.49**	1.0				
College Self- Efficacy	-.30**	.63**	1.0			
*Aggregate Subjective Well-Being	-.41**	.71**	.50**	1.0		
Self-Esteem	-.30**	.59**	.48**	.67**	1.0	
Social support	-.26**	.36*	.48**	.31*	.44**	1.0

$N = 80$ ; \*  $p < .05$ ; \*\*  $p < .01$

AD/HD Symptom Severity – AD/HD Current Symptoms Scale – Self-Report

College Self-Efficacy Scale – College Self-Efficacy Scale

Self-Esteem – Rosenberg Self-Esteem Scale

College Adjustment – Student Adaptation to College Questionnaire

Social Support – Social Provisions Scale

Subjective Well-Being- \*Aggregate Subjective Well-Being (created by standardizing scores of the Positive Affectivity (PA), Negative Affectivity (NA), and Satisfaction With Life Scales (SWLS), and then subtracting the NA scores from the sum of PA and SWLS scores)

*Hypothesis 2c. Self-esteem will be positively related to subjective well-being.*

To test this hypothesis, a zero-order correlational analysis between participants' ratings of their self-esteem (as indicated by total scores on the self-esteem measure) and participants' subjective well-being (as indicated by participants' aggregate subjective well-being scores) was conducted. As Table 2 indicates, a significant positive correlation was found between self-esteem and aggregate subjective well-being ( $r = .67$ ;  $p < .001$ ), supporting the hypothesis.

*Hypothesis 2d. Self-esteem will be positively related to overall college adjustment.*

To test this hypothesis, a zero-order correlational analysis between participants' ratings of their self-esteem (as indicated by total scores on the self-esteem measure) and participants' overall college adjustment (as indicated by participants' total scores on the college adjustment measure) was conducted. As Table 2 indicates, a significant positive correlation was found between self-esteem and overall college adjustment ( $r = .59$ ;  $p < .001$ ), supporting the hypothesis.

*Hypothesis 3a. Social support will be positively related to subjective well-being.*

To test this hypothesis, a zero-order correlational analysis between participants' social support (as indicated by total scores on the social support measure) and participants' subjective well-being (as indicated by participants' aggregate subjective well-being scores) was conducted. As Table 2 indicates, a significant positive correlation was found between social support and aggregate subjective well-being ( $r = .31$ ;  $p < .01$ ), supporting the hypothesis.



*Hypothesis 3b. Social support will be positively related to overall college adjustment.*

To test this hypothesis, a zero-order correlational analysis between participants' social support (as indicated by total scores on the social support measure) and participants' overall college adjustment (as indicated by participants' total scores on the college adjustment measure) was conducted. As Table 2 indicates, a significant positive correlation was found between social support and overall college adjustment ( $r = .36$ ;  $p < .01$ ), supporting the hypothesis.

*Hypothesis 4a. The biomedical factor (AD/HD symptom severity) and psychosocial factors (college self-efficacy, self-esteem and social support) will significantly contribute to the variance of subjective well-being, with the psychosocial factors contributing above and beyond the effects of the biomedical factor.*

This hypothesis was tested using hierarchical multiple regression analysis. Specifically, hierarchical, blockwise regression analysis was conducted to assess the proportion of the variance in subjective well-being accounted for by the biomedical factor (AD/HD symptom severity) as compared to the psychosocial factors (college self-efficacy, self-esteem, and social support). The biomedical factor (AD/HD symptom severity) was entered into the first block. The psychosocial variables (college self-efficacy, self-esteem, and social support) were then entered into the second block. When considering all four predictors, the regression equation was significant ( $F [4,73] = 20.56$ ,  $p = .000$ ). All four variables combined accounted for approximately 53 percent of the variance of subjective well-being. The biomedical factor (AD/HD symptom severity) accounted for approximately 16% of the variance. The psychosocial variables combined

accounted for approximately 37% of the variance of subjective well-being over and above the biomedical factor, supporting the hypothesis. As Table 3 illustrates, the beta weights were significant for AD/HD symptom severity, college self-efficacy, and self-esteem, indicating that each of these variables contribute unique variance to subjective well-being, whereas the beta weight for social support was not significant.

*Hypothesis 4b. The biomedical factor (current AD/HD symptom severity) and psychosocial factors (college self-efficacy, self-esteem, and social support) will significantly contribute to the variance of college adjustment, with the psychosocial factors contributing above and beyond the effects of the biomedical factor.*

This hypothesis was also tested using hierarchical regression analysis. Specifically, hierarchical, blockwise regression analysis was conducted to assess the proportion of the variance in college adjustment accounted for by the biomedical factor (AD/HD symptom severity) as compared to the psychosocial factors (college self-efficacy, self-esteem, and social support). The biomedical factor (AD/HD symptom severity) was entered into the first block. The psychosocial variables (college self-efficacy, self-esteem, and social support) were then entered into the second block. When considering all four predictors, the regression equation was significant ( $F [4,74] = 24.85, p < .001$ ). Together the four variables accounted for approximately 57 percent of the variance of overall college adjustment. The biomedical factor (AD/HD symptom severity) accounted for approximately 22% of the variance. The psychosocial variables combined accounted for approximately 35% of the variance of college adjustment over

Table 3

*Hierarchical Blockwise Multiple Regression Analysis with Biopsychosocial Variables as Predictors of Subjective Well-Being*

Predictor	B	SEB	$\beta$
<u>Step 1</u>			
AD/HD Symptom Severity	-.088	.023	-.41**
<u>Step 2</u>			
AD/HD Symptom Severity	-.042	.019	-.19*
College Self-Efficacy	.018	.008	.23*
Self-Esteem	.223	.039	.546**
Social support	-.015	.015	-.092

*N* = 80

Note: Step 1-  $R^2 = .16$ ,  $F(1,76) = 14.93$ ,  $p < .01$ ; Step 2-  $R^2$  Change = .37,  $F(4, 73) = 20.56$ ,  $p < .001$ .

\*  $p < .05$ ; \*\* $p < .01$

and above the biomedical factor, supporting the hypothesis. As Table 4 illustrates, the beta weights for AD/HD symptom severity, college self-efficacy, and self-esteem were significant, indicating that each of these variables contributes unique variance to subjective well-being, whereas the beta weight for social support was not significant.

*Hypothesis 5a. College self-efficacy and self-esteem will partially mediate the relationship between social support and subjective well-being.*

Hypotheses 5a was tested using procedures outlined by Baron and Kenny (1986) and Frazier, Tix, and Barron (2004) to test for mediation effects. More specifically, a hierarchical regression analysis was conducted to test the hypothesized role of college self-efficacy and self-esteem as partial mediators of the relationship between social support and subjective well-being.

First, social support was entered in a regression predicting aggregate subjective well-being, testing for a significant relationship between social support and aggregate subjective well-being. A significant relationship was found between social support and aggregate subjective well-being ( $R^2 = .10, p < .01$ ). College self-efficacy and self-esteem were then entered (as a block) in the second step, which allowed for a test of whether college self-efficacy and self-esteem partially mediated the relationship between social

Table 4

*Hierarchical Blockwise Multiple Regression Analysis with Biopsychosocial Variables as Predictors of Overall College Adjustment*

Predictor	B	SEB	$\beta$
<i>Step 1</i>			
AD/HD Symptom Severity	-3.25	.724	-.47**
<i>Step 2</i>			
AD/HD Symptom Severity	-1.78	.586	-.26**
College Self-Efficacy	1.01	.243	.41**
Self-Esteem	4.53	1.24	.346**
Social Support	-.271	.486	-.052

$N = 80$

Note: Step 1-  $R^2 = .22, F(1,71) = 20.16, p < .001$ ; Step 2-  $R^2$  Change = .35,  $F(4, 68) = 22.63, p < .001$ .

\*  $p < .05$ ; \*\*  $p < .01$

support and aggregate subjective well-being. As Table 5 illustrates, the addition of the psychosocial variables of college self-efficacy and self-esteem accounted for an additional 40 percent of the variance ( $R^2$  change = .40). Furthermore, once college self-efficacy and self-esteem were entered into the equation, social support no longer demonstrated a significant relationship to aggregate subjective well-being ( $\beta = -.07, ns$ ).

Moreover, in addition to the procedures outlined by Barron and Kenny (1986), Frazier, Tix, and Barron (2004) recommend testing for the significance of the mediating effect. Using the procedures outlined by Frazier et. al. (2004), the mediating effects of the psychological variables (e.g., college self-efficacy and self-esteem) were found to be significant ( $p < .05$ ), supporting the hypothesis that college self-efficacy and self-esteem partially mediate the relationship between social support and aggregate subjective well-being for the sample.

*Hypothesis 5b. College self-efficacy and self-esteem will partially mediate the relationship between social support and college adjustment.*

Hypotheses 5b was also tested using the procedures outlined by Baron and Kenny (1986) and Frazier et. al. (2004) to test for mediation effects. More specifically, a hierarchical regression analysis was conducted to test the hypothesized role of college self-efficacy and self-esteem as mediators of the relationship between social support and overall college adjustment. First, social support was entered in a regression predicting overall college adjustment, testing for a significant relationship between social support and overall college adjustment. A significant relationship was found between social support and overall college adjustment ( $R^2 = .13, p < .01$ ). College self-efficacy and self-esteem were then entered in the second step, allowing for a test of whether college self-efficacy and self-esteem partially mediated the relationship between social support and overall college adjustment. The addition of the psychosocial variables accounted for an

Table 5

*Hierarchical Multiple Regression Analyses Testing the Mediation of the Relationship Between Social Support and Subjective Well-Being by the Psychological Variables*

Predictor	B	SEB	$\beta$	T	Sig T
<u>Step 1</u>					
Social Support	.051	.018	.31	2.85	.006**
<u>Step 2</u>					
Social Support	-.012	.016	-.073	-.741	.461
College Self-Efficacy	.020	.008	.258	2.59	.012*
Self-Esteem	.236	.040	.580	5.93	.000**

*N* = 80

Note: Step 1-  $R^2 = .10$ ,  $F(1,76) = 8.134$ ,  $p < .01$ ; Step 2-  $R^2$  Change = .40,  $F(3, 74) = 24.37$ ,  $p < .001$ .  
 $p < .05$ ; \*\* $p < .01$

additional 37 percent of the variance ( $R^2$  change = .37). As Table 6 illustrates, once college self-efficacy and self-esteem were entered into the equation, social support no longer demonstrated a significant relationship to overall college adjustment ( $\beta = -.03$ , ns). Furthermore, using the procedures outlined by Frazier et. al. (2004), the mediating effects of the psychological variables (e.g., college self-efficacy and self-esteem) were found to be significant ( $p < .05$ ), supporting the hypothesis that college self-efficacy and self-esteem partially mediate the relationship between social support and overall college adjustment for students in the sample.

Table 6

*Hierarchical Multiple Regression Analyses Testing the Mediation of the Relationship Between Social Support and Overall College Adjustment by the Psychological Variables*

Predictor	B	SEB	$\beta$	T	Sig. T
<i>Step 1</i>					
Social Support	1.83	.545	.359**	3.37	.001**
<i>Step 2</i>					
Social Support	-.160	.493	-.031	-.325	.746
College Self-Efficacy	1.11	.237	.461**	4.68	.000**
Self-Esteem	4.78	1.21	.381**	3.95	.000**

*N* = 80

Note: Step 1-  $R^2 = .13$ ,  $F(1,77) = 11.37$ ,  $p < .01$ ; Step 2-  $R^2$  Change = .37,  $F(3, 75) = 25.44$ ,  $p < .001$ .

\*  $p < .05$ ; \*\* $p < .01$

*Exploratory Analyses*

In addition to the above-mentioned hypotheses, additional questions were explored in the present study. Zero-order correlational analyses were used to examine the first three exploratory questions regarding the possible relation between demographic variables (e.g., class year and gender) and health outcomes (e.g., subjective well-being and college adjustment in students in the sample. One-way ANOVA analyses were used to examine the remaining exploratory questions.

(1) *Is there a relationship between year in school and college adjustment for students with AD/HD?* No significant relationship was found between students' year in school and overall college adjustment ( $r = .06$ , ns).

(2) *Is there a relationship between gender and subjective well-being in college students with AD/HD?* No significant relationship was found between students' gender and subjective well-being ( $r = -.12$ , ns).

(3) *Is there a relationship between gender and college adjustment in students with AD/HD?* No significant relationship was found between students' gender and overall college adjustment ( $r = -.12$ , ns).

(4) *Are there differences in levels of subjective well-being among students with an AD/HD and comorbid specific LD diagnosis, an AD/HD and comorbid psychiatric diagnosis, and students with an AD/HD diagnosis alone?* To explore the potential differences in subjective well-being among students in different diagnostic groups, a one-way ANOVA was conducted and significant group differences were found ( $F [3,74] = 14.34$ ,  $p < .05$ ). Specifically, examination of Tukey's HSD revealed that those diagnosed with AD/HD and a psychiatric condition (e.g., depression, anxiety) demonstrated a significantly lower mean score on subjective well-being, as compared to students with AD/HD only and to students with AD/HD and a comorbid learning disability. No other significant differences were found among the diagnostic groups.

(5) *Are there differences in levels of overall college adjustment among students with an AD/HD and comorbid specific LD diagnosis, an AD/HD and comorbid psychiatric diagnosis, and students with an AD/HD diagnosis alone?* To explore the potential differences in levels of overall college adjustment among students in different diagnostic groups, a one-way ANOVA was conducted. No significant group differences were found among diagnostic groups on scores of overall college adjustment.



*(6) Are there differences in levels of AD/HD symptom severity among students with an AD/HD and comorbid specific LD diagnosis, students with an AD/HD and comorbid psychiatric mood disorder, and students with an AD/HD diagnosis alone?*

To explore potential differences in AD/HD symptom severity level by diagnostic group, a one-way ANOVA was conducted. No significant diagnostic group differences in levels of reported AD/HD symptom severity were found.

*(7) Are there differences in levels of self-esteem and college self-efficacy among students with an AD/HD and comorbid specific LD diagnosis, students with an AD/HD and comorbid psychiatric mood disorder, and students with an AD/HD diagnosis alone?*

To explore potential differences in levels of self-esteem and college self-efficacy by diagnostic group, a one-way ANOVA was conducted. No significant diagnostic group differences in levels of either self-esteem or college self-efficacy were found.

## Chapter 6

### *Discussion*

The purpose of this study was to examine the relationship of multiple biopsychosocial factors to health status outcomes (e.g., the subjective well-being and college adjustment) of students with diagnosed AD/HD. Applying a biopsychosocial framework, this study examined the relationship between multiple biomedical, psychological, and social factors to broadly defined health status outcomes (e.g., subjective well-being and college adjustment) for college students with diagnosed AD/HD. This study may be the first to apply a biopsychosocial framework to simultaneously examine these factors related to these health status outcomes in this population of college students. First, this section discusses the results obtained from the primary analyses, including a brief discussion of the relationship of each individual biopsychosocial factor to the health status outcomes (e.g., subjective well-being and college adjustment) for college students with AD/HD in the sample. Next, findings of the regression analyses comparing the contributions of the biomedical and psychosocial factors to the variance in the health status outcomes are discussed. Third, results regarding the partial mediating role of college self-efficacy and self-esteem in the relationship between social support and the health status outcomes are discussed. Fourth, exploratory analyses are examined. Fifth, this section addresses implications for research and counseling practice, including implications for learning assistance and disability support services programs on campus. Finally, limitations of the study are discussed along with directions for future research.

### *AD/HD Symptom Severity*

The present study examined the relationship between AD/HD symptom severity and broadly defined health status outcomes (e.g., subjective well-being and college adjustment) for college students with diagnosed AD/HD. As hypothesized, findings indicated that AD/HD symptom severity is negatively related to both subjective well-being and college adjustment for students with AD/HD in this sample. Specifically, results suggested that students with higher levels of AD/HD symptom severity experience lower levels of subjective well-being and overall college adjustment than students with lower levels of AD/HD symptom severity.

Findings of the present study are consistent with previous research which has demonstrated a negative relationship between AD/HD symptom severity and various psychosocial and adjustment outcomes for students with AD/HD in the college context (Heiligenstein et al., 1999; Turnock et al., 1998). In addition, findings of the present study make sense in light of the nature of AD/HD symptomatology. For example, inattentive and/or hyperactive symptoms of AD/HD may potentially interfere with many aspects of students' adjustment in the college context in a variety of ways. For example, inattentiveness in AD/HD is often marked by particular difficulties with sustained attention, including distractibility and difficulty maintaining attention on tasks that are considered routine and tedious (Zentall, 1993). Academic demands of the college environment often require independent goal-setting, time management, and follow-through for successful completion. Given such demands in the college context, symptoms of inattentiveness may manifest in procrastination, poor time management, and problems with goal-setting, including difficulty completing assignments.

Likewise, hyperactive symptoms may be manifested in college students with AD/HD in the form of physical restlessness and sleeping difficulties, which may result in difficulties attending classes and focusing on lectures over extended periods of time (Quinn, 1996). Symptoms of inattentiveness and hyperactivity may also impede emotion regulation and the development of an appropriate understanding of social, living, and daily skills in the college environment (Javorsky & Gussin, 1994). Overall, symptoms of AD/HD may potentially interfere with students' adjustment in the college context and overall sense of well-being in a variety of ways. Findings regarding the negative relationship between AD/HD symptom severity and the health status outcomes in this study make sense in light of the nature of the inattentive and hyperactive symptoms of AD/HD, and are consistent with findings of previous research.

#### *College Self-Efficacy*

The present study also examined the relationship between college self-efficacy and the health status outcomes (e.g., subjective well-being and college adjustment) for the sample. As hypothesized, results suggested that students in the sample with higher levels of college self-efficacy experienced higher levels of subjective well-being and overall college adjustment than students with lower levels of college self-efficacy.

Findings of the present study are consistent with self-efficacy theory and previous research on college students. More specifically, self-efficacy theory maintains that self-efficacy beliefs play a crucial role in psychological adjustment, psychological problems, and well-being (Maddux, 2000, Bandura, 1997, 1986). Bandura (1997) particularly emphasizes the importance of self-efficacy beliefs during transitional experiences of adolescence, (including educational transitions) and proposes that adolescents' beliefs in

their efficacy in social and academic areas affect their emotional well-being and development. Moreover, Bandura (1997) proposes that domain-specific self-efficacy beliefs are most predictive of outcomes in specific contexts. Results of this study support these ideas, demonstrating a significant relationship between levels of domain-specific (i.e., college self-efficacy) and subjective well-being and college adjustment for students with diagnosed AD/HD.

Findings of this study are also consistent with extensive previous research (DeWitz & Walsh, 2002, Lent et al., 1986; Lent et al., 1984; Multon et al., 1991; Solberg & Villarreal, 1997), which has highlighted the important role of self-efficacy in predicting domain-specific psychosocial adjustment and performance outcomes for college students. Specifically, results of the present study suggest that the more students with AD/HD feel confident in performing various college tasks (e.g., domain-specific self-efficacy), the greater their sense of overall college adjustment.

It may also be that college self-efficacy acts on a broader level through the more effective use of metacognitive strategies for the student with AD/HD. As Chemers, Hu, and Garcia (2001) explain, metacognition involves the appraisal and control of one's cognitive activity (i.e., thinking about thinking) and making use of all the resources available in the task and social environment to achieve goal attainment (Zimmerman, 1995; Zimmerman & Martinez-Pons, 1988). Self-efficacy may facilitate planning and self-regulation, skills that are inherently more challenging for the student with AD/HD (given the nature of AD/HD symptomatology) and that become increasingly important as students with AD/HD progress through educational levels that are increasingly less structured (such as in the college environment). Subsequently, students with AD/HD that

are higher in college self-efficacy may make greater use of effective cognitive strategies, manage their time more effectively, may be better at monitoring and regulating their own effort in the college environment, and subsequently experience higher levels of adjustment and subjective well-being in the college setting.

In addition, while extensive previous research has demonstrated a positive relationship between domain-specific self-efficacy beliefs and college students' adjustment and performance outcomes, Bandura (1997) also argues for the importance of self-efficacy in psychological adjustment even more broadly. More recent research has begun to focus on the role of self-efficacy beliefs on more broad affective and cognitive states, such as well-being and satisfaction (DeWitz & Walsh, 2002). This study extends these ideas and newer areas of research, supporting the notion that self-efficacy beliefs not only impact domain-specific adjustment outcomes such as college adjustment, but may also be more broadly related to subjective of well-being (including affective and cognitive states and life satisfaction) for students with AD/HD in the college context.

Finally, in considering these findings, it is interesting to note that while the mean college self-efficacy score for this sample (Mean = 119.77; SD = 27.54) was lower and more variable than the roughly estimated mean college self-efficacy for general college samples from previous studies (Mean = 127.2; SD = 18.9), it may not have been significantly lower (e.g., greater than one standard deviation below the mean) than such estimates. However, this was not statistically analyzed. This has a number of interesting potential implications that are further discussed later in this chapter in the section on implications and directions for future research.

### *Self-Esteem*

Self-esteem was also examined in relation to health status outcomes (e.g., subjective well-being and college adjustment) for college students with diagnosed AD/HD. As hypothesized, results suggested that students with higher levels of self-esteem experience higher levels of subjective well-being and overall college adjustment than students with lower levels of self-esteem. Findings of the present study are consistent with previous research (Heiligensten et al., 1999), which has demonstrated a positive relationship between levels of self-esteem and adjustment and well-being for students with AD/HD in the college context.

Particularly given that extensive previous research (Mannuzza & Klein, 1999; Dooling-Litfin, 1997; Shaw, 2000; Slomkowski et al., 1995) has demonstrated that college students with AD/HD are at *risk* for lower levels of self-esteem (as compared to their peers without AD/HD), this study further highlights the importance of considering self-esteem as a salient psychosocial variable among factors related to the subjective well-being and college adjustment of students with AD/HD.

In considering these findings, it is important to note that there are no published norms for college students for self-esteem (e.g., as measured by the Rosenberg Self-Esteem Scale) and that there is wide variability in means for self-esteem among previous studies with college student samples. In general, however, the mean for self-esteem for the sample in the present study (Mean = 30.2; SD = 5.3) was slightly lower than those of a number of studies with college students (given that scores in previous studies range up to 60, and most means are generally 32 or above). This has a number of potential

interesting implications which are further discussed later in this chapter in the section on implications and directions for future research.

### *Social Support*

Social support was also examined in relation to health status outcomes (e.g., subjective well-being and college adjustment) for the sample. As hypothesized, results suggested that students that experience higher levels of social support experience higher levels of subjective well-being and overall college adjustment than students with lower levels of social support. These findings are consistent with theory and extensive previous research which has demonstrated a relationship between social support and enhanced well-being and positive adjustment outcomes for individuals in various contexts, including late adolescents in the college setting (Ryan & Deci, 2001, Damsteegt, 1992, Zea, 1995, Demakis, 1994; Cutrona & Russell, 1987; Hays & Oxley, 1986).

While social support has been repeatedly demonstrated to be an important personal resource predictive of adjustment outcomes for college students in general, this study is among the first to examine the role of social support in relation to subjective well-being and college adjustment for students with diagnosed AD/HD. Results of this study suggest a positive relationship between levels of social support and health status outcomes (e.g., subjective well-being and college adjustment) for students with AD/HD. Given the many academic and psychosocial challenges encountered by students with AD/HD in the college setting, it makes sense that levels of social support would be positively related to health and adjustment outcomes for this population.

For example, consistent with coping theory and research (Weiss, 1974; Cutrona & Russell, 1987; Hays & Oxley, 1986; Carpenter & Scott, 1992), social support may



provide students with AD/HD with a greater sense of security and emotional support, and subsequently reduce their vulnerability to stress amidst the many challenges they face in the college environment. Also, various forms of social support (including peers, parents, teachers, and academic support services) may serve as sources of tangible guidance, facilitating effective coping efforts and successful adjustment outcomes for this population. In sum, the various provisions of social support may facilitate health status outcomes for students with AD/HD in a variety of ways, promoting adjustment and subjective well-being and alleviating negative affect amidst the many challenges faced by these students in the college environment.

In considering these findings, it is interesting to note that while the mean social support score for this sample (Mean = 77.9; SD = 12.95) was lower and more variable than mean for general college samples (Mean = 82.45; SD = 9.89) (Cutrona & Russell, 1987), it likely was not significantly lower (e.g., greater than one standard deviation), although statistical analyses were not conducted. In conjunction with the findings regarding the mean estimates for self-esteem and college self-efficacy, this has a number of potential interesting implications which are further discussed later in this chapter in the section on implications and directions for future research.

#### *The Biopsychosocial Model of Health Status*

Next, applying the biopsychosocial model of health status, this study simultaneously examined the combined contributions of the biomedical and psychosocial factors to the variance of health status outcomes (e.g., subjective well-being and college adjustment) for college students with AD/HD in the sample. As hypothesized, all four biopsychosocial factors combined accounted for a large amount of variance in both health

status outcomes (approximately 53 percent of the variance in subjective well-being and approximately 57 percent of the variance in overall college adjustment) in the sample. Moreover, the combined psychosocial variables (e.g., self-esteem, college self-efficacy, and social support) contributed significantly to the variance of the health status outcomes above and beyond the variance predicted by the biomedical factor. Overall, consistent with the biopsychosocial model of health status, these findings support the importance of simultaneously considering psychosocial variables in conjunction with biomedical factors (e.g., AD/HD symptom severity) in understanding and addressing the complexity of health status outcomes (e.g., subjective well-being and college adjustment) for students with AD/HD.

Furthermore, closer examination of the individual beta weights in the regression analyses suggest that AD/HD symptom severity, self-esteem, and college self-efficacy each significantly contributed to the variance of the health status outcomes independent of each other. Interestingly, the psychological variables contributed the largest amount of variance to both health status outcomes. More specifically, self-esteem accounted for the largest amount of variance in subjective well-being (above self-efficacy, AD/HD symptom severity, and social support), and college self-efficacy accounted for the largest amount of variance in college adjustment (followed by self-esteem, AD/HD symptom severity, and social support). These findings suggest not only that it may be more important to emphasize psychological over biomedical factors (e.g., AD/HD symptom severity) in addressing these particular health status outcomes for college students with AD/HD, but also that it may be important to emphasize different psychological factors depending on the nature of the health status outcome being considered. For example, for

more global health status outcomes (such as subjective well-being), more global psychological mechanisms may be salient (e.g., self-esteem), whereas for more domain-specific health status outcomes (such as college adjustment), domain-specific psychological factors (e.g., college self-efficacy) may be more salient.

Finally, while significant beta weights emerged for AD/HD symptom severity, self-esteem, and college self-efficacy for both health status outcomes, social support did not significantly contribute to the variance in either of the health status outcomes controlling for the other biopsychosocial predictors. These findings make sense in the context of the mediational hypotheses and analyses discussed next.

#### *The Mediating Role of Self-Efficacy and Self-Esteem in the Relationship Between Social Support and Health Status Outcomes*

The present study also proposed that the psychological variables (e.g., self-efficacy and self-esteem) would partially mediate the relationship between social support and health status outcomes (e.g., subjective well-being and college adjustment) for students with diagnosed AD/HD. These hypotheses were supported, suggesting that college self-efficacy and self-esteem partially mediated the relationship between social support and the health status outcomes for the sample. Findings regarding the mediating role of these psychological variables are consistent with theory and previous research on the mechanisms through which social support facilitates well-being and adjustment outcomes in various populations.

For example, social support is theorized to indirectly influence health status and positive adjustment outcomes by means of its *provisions* (Weiss, 1974; Cutrona & Russell, 1987) or facilitation of mediating psychological and personality variables

(including self-efficacy and self-esteem), which are thought to have a more direct influence on health status outcomes. Also, in the context of Bandura's (1986,1987) social cognitive theory, social support is theorized to serve as a valuable source of self-efficacy when one is confronted with challenging life conditions (Lent et al., 2004). Coping theory also highlights the indirect role of social support in facilitating adjustment and well-being by bolstering self-esteem and self-confidence, and by providing informational guidance that assists in planning successful coping strategies (Carpenter & Scott, 1992).

Overall, the results of the present study suggest a partial mediating role of psychological factors (e.g., self-esteem and college self-efficacy) in the relationship between social support and the health status outcomes examined in this study. Interestingly, consistent with coping theory and research, these findings support the idea that it is not only important to consider levels of social support in general, but also to consider some of the more specific psychological mechanisms, or psychological provisions (in this case self-esteem and college self-efficacy) through which social support operates in enhancing certain health status outcomes for college students with AD/HD. More specifically, results not only suggest that general levels of social support are positively related to subjective well-being and college adjustment for the sample in the present study, but also begin to clarify (in part) why and how social support is positively related to such outcomes for the sample. By further clarifying the mechanisms through which social support operates, more effective support interventions may be developed to specifically target these mechanisms (e.g., college self-efficacy and self-esteem) and subsequently more effectively address and enhance health status outcomes

for this population. Specific examples of such interventions will be addressed later in this chapter in the discussion of the implication of these findings for counseling psychology practice.

### *Exploratory Questions*

The exploratory analyses examined the relationship between additional demographic and diagnostic variables and health status outcomes (e.g., college adjustment and subjective well-being) of students with AD/HD.

*Exploratory question 1.* The first exploratory question examined the relationship between class year and college adjustment of students with AD/HD. No significant relationship was found between class year and college adjustment for these students. This finding is surprising, given that it would seem logical to assume that students with AD/HD who have been in the college environment longer, who have had more time to adjust to the college environment, and who have successfully advanced to higher grade levels, would report higher levels of college adjustment than students at lower grade levels. A possible explanation for the lack of significant findings may be that the length of time in the college environment may interact with personality factors to provide varied experiences in the college setting. For example, while the length of time in the college environment may provide for greater opportunities to adjust and adapt, it may also provide for greater personal, social, and academic challenges and stressors, given the increasing demands as one progresses to higher grade levels. Students with AD/HD may experience these challenges and stressors in different ways based on a variety of factors (e.g., personality factors, coping skills, personal and social resources, etc.), and

subsequently class year may not have a direct correlation with college adjustment for these students.

It may also be that students with AD/HD who have difficulty adjusting to and navigating the demands of college may drop out, and therefore class year would not correlate with college adjustment for these students. Along these lines, it is particularly interesting to note that a large percentage of students in the sample for the present study (41.3%) were transfer students. Based on admissions data from the University of Maryland (UMD) website, this represents a slightly higher percentage of transfer students than are found in the general student body (38%) (e.g., especially given that only 25% of students in the present sample were freshmen and that few of the transfer students at UMD are freshman status). This may indicate a trend in strategies that students with AD/HD may use to successfully navigate the demands of a competitive 4-year institution. More specifically, admissions data from the UMD website specifies that the majority of transfer students in the general undergraduate student body come from in-state community colleges (followed by students from 4-year universities and out-of-state colleges). While the nature of the type of transfer institution was unknown in the present study (the researcher did not ask participants to specify this information on the demographic questionnaire), perhaps given the additional challenges they face in the college environment, students with AD/HD may particularly rely on and benefit from successfully adapting to the demands of a community college before assuming the challenges of a competitive 4-year university.

Finally, while no statistically significant relationship was found between class year and college adjustment for the present sample, it is notable that there seemed to be

somewhat of a trend in the predicted direction between these two variables, perhaps suggesting that students with AD/HD who are less successful at navigating the demands of college may tend to drop out. Given this seeming trend, perhaps a larger sample would have yielded clearer findings in the predicted direction, and would have demonstrated a significant relationship between class year and college adjustment for students with AD/HD. This remains an interesting area to continue to explore in future research.

*Exploratory question 2.* The second exploratory question examined the relationship between gender and subjective well-being in college students with AD/HD. No significant relationship was found between gender and subjective well-being for the sample. These findings are consistent with extensive previous research, which has suggested a low correlation between demographic variables (including gender) and subjective well-being. As highlighted by Lent et al., (2004), individual and demographic variables have typically been found to explain 3% or less of the variance in happiness or life satisfaction across studies (DeNeve, 1999). Results of this exploratory analysis further support this idea, suggesting that gender was not related to the experience of subjective well-being for the students in the sample.

*Exploratory question 3.* The third exploratory question examined the relationship between gender and college adjustment for students with AD/HD in the sample. No significant relationship was found between gender and college adjustment for these students. While some research has suggested gender differences in adjustment and functional status of children and adults with AD/HD (Arcia & Connors, 1998) findings of

this exploratory analysis do not indicate a relationship between gender and levels of overall college adjustment for the sample.

*Exploratory question 4.* The fourth exploratory question considered differences in the subjective well-being among students with AD/HD in different diagnostic subgroups (i.e., students with diagnosed AD/HD only, students with AD/HD and a comorbid specific LD diagnosis, and students with AD/HD and a diagnosed comorbid psychiatric condition such as depression or anxiety). Examination of Tukey's HSD revealed that those students diagnosed with AD/HD and a comorbid psychiatric mood disorder (e.g., depression, anxiety) demonstrated a significantly lower mean score on subjective well-being, as compared to the other diagnostic subgroups. No other significant differences were found among the diagnostic subgroups. The findings regarding the significant difference in subjective well-being (e.g., lower subjective well-being) in the comorbid psychiatric group (as compared to the other AD/HD subgroups) make sense given the conceptualization and nature of the measurement of subjective well-being in this study (e.g., positive affect, negative affect, and life satisfaction). In other words, it makes sense that students who have comorbid diagnoses of depression and anxiety would report lower levels of positive affect, higher levels of negative affect, and experience lower levels of life satisfaction given the nature of comorbid psychiatric diagnoses (e.g., given that depression and anxiety are characterized by negative mood and affect and decreased ability to enjoy life). Implications of these findings are further discussed later in this chapter in the section addressing implications and suggested directions for future research.



*Exploratory question 5.* The fifth exploratory question considered differences in levels of overall college adjustment among students with AD/HD in different diagnostic subgroups (i.e., students with diagnosed AD/HD only, students with AD/HD and a comorbid specific LD diagnosis, and students with AD/HD and a diagnosed comorbid psychiatric condition such as depression or anxiety). No significant differences were found among diagnostic subgroups on levels of overall college adjustment. This finding is contradictory to some previous research which has suggested that the presence of comorbid learning disorders place individuals with AD/HD at a much greater risk for poorer adjustment (including academic and social adjustment) in different contexts than those without comorbid learning disorders (Hinshaw, 1992; Frick et al., 1991). It may be that while students with AD/HD and comorbid psychiatric and learning disorders are at greater *risk* for poorer adjustment in different contexts, the actual impact of having comorbid diagnoses with AD/HD (in terms of domain-specific outcomes) may be more dependent on mediating and moderating variables (e.g., personality factors, levels of domain-specific self-efficacy, social resources, etc.). Implications of these findings are further discussed later in this chapter in the section addressing implications and suggested directions for future research.

*Exploratory question 6.* The sixth exploratory question considered differences in levels of AD/HD symptom severity among students with AD/HD in different diagnostic subgroups (i.e., students with diagnosed AD/HD only, students with AD/HD and a comorbid specific LD diagnosis, and students with AD/HD and a comorbid psychiatric diagnosis such as depression or anxiety). Particularly given the nature of the predominant comorbid psychiatric diagnoses in the sample (e.g., depression and anxiety),

this question attempted to explore whether affective states may be related to the way students experience and interpret their AD/HD symptoms (given that AD/HD symptom severity was based solely on self-report in this study). No significant diagnostic group differences were found in reported levels of AD/HD symptom severity, suggesting that students' experience of the severity of their AD/HD symptoms in this sample was independent of their comorbid diagnostic status. Implications of these findings are further discussed later in this chapter in the section addressing implications and suggested directions for future research.

*Exploratory question 7.* The seventh exploratory question considered differences in levels of self-esteem and college self-efficacy among students with AD/HD in different diagnostic subgroups (i.e., students with diagnosed AD/HD only, students with AD/HD and a comorbid specific LD diagnosis, and students with AD/HD and a comorbid psychiatric diagnosis such as depression or anxiety). Particularly given research which has demonstrated a potential relationship between depression and anxiety levels of self-esteem and self-efficacy, this question attempted to explore whether comorbid psychiatric diagnoses in the sample may have been related to either of the psychological predictor variables (e.g., self-esteem and college self-efficacy) in this study. No significant diagnostic group differences were found in levels of reported levels of self-esteem or college self-efficacy were found, suggesting that reported levels of these constructs was independent of participants' comorbid diagnostic status for this sample. Implications of these findings are further discussed in the next section addressing implications and suggested directions for future research.

*Implications for Research and Practice in Counseling Psychology*

This study is likely the first to apply the biopsychosocial model of health status to simultaneously examine multiple biopsychosocial factors related to the subjective well-being and college adjustment of students with diagnosed AD/HD. Findings of the present study potentially have a wide range of implications for both research and practice relevant to counseling psychology.

First, AD/HD has been more recently recognized as a valid late adolescent and adult diagnosis, yet little research has been conducted on the psychosocial outcomes of AD/HD in college students. This study expands research on late adolescent and young adult AD/HD by having examined multiple biopsychosocial factors related to health status outcomes of this population of college students. Furthermore, this study contributes to the expanding research on the biopsychosocial model of health status, suggesting the importance of considering the interface of biological and psychosocial factors related to health status outcomes in college students with AD/HD.

Moreover, this study also expands on well-being research, consistent with the hygiological mission of counseling psychology. As Lent (2004) highlights, Super (1955) described counseling psychology as concerned with examining and developing personal and social resources and adaptive tendencies amidst life challenges. By examining biopsychosocial factors related to health status outcomes of students with AD/HD amidst the many challenges they face, this study expands well-being research, consistent with the mission of counseling psychology.

In addition to contributing to counseling psychology research, this study has many implications for counseling psychology practice. For one, while traditional approaches to

working with students with AD/HD in the college setting tend to be compartmentalized, findings of this study argue for a more integrated, biopsychosocial approach that simultaneously considers the biomedical, psychological, and social needs college students with AD/HD. For example, students with AD/HD often have to seek out different services to help manage the various aspects of the disorder in the college setting. Also, there is often little communication between medical doctors (e.g., psychiatrists prescribing medication to manage AD/HD symptomatology for these students), counseling services for personal and social support, and learning assistance services for academic support and skills development. While some research (MTA Cooperative Group, 1999) has begun to examine argue for a multimodal approach in the conceptualization and treatment of children with AD/HD, this study highlights the need to apply a multi-modal biopsychosocial conceptualization and approach to facilitating positive health status outcomes for students with AD/HD in the college setting.

Moreover, this study has implications for better understanding and tailoring the psychosocial aspect of multimodal interventions for students with AD/HD in the college setting. More specifically, results of this study not only suggest that social support is an important variable related to health status outcomes (e.g., subjective well-being and college adjustment) for students with AD/HD, but consistent with coping theory (Cutrona & Russell, 1987; Weiss 1974), also suggest that college self-efficacy and self-esteem are important psychological mechanisms through which social support operates to enhance these health status outcomes for this population. Psychosocial support interventions could be more specifically tailored to facilitate these constructs in students with AD/HD,

and subsequently more effectively target and enhance subjective well-being and college adjustment for these students.

For example, Maddux (2002) discusses primary sources of self-efficacy beliefs including vicarious experiences and verbal persuasion. Regarding vicarious experiences, self-efficacy in a particular domain may be enhanced by observing the successes of similar others (Maddux, 2002). College students with AD/HD therefore might particularly benefit from a peer mentoring program specifically aimed at enhancing college self-efficacy by providing vicarious experiences. More specifically, students with AD/HD who have successfully navigated various challenges in the college environment could serve as mentors for incoming students with AD/HD, providing them with successful role models in the college environment to enhance college self-efficacy.

Also, Maddux (2000) highlights that various forms of verbal persuasion can serve to enhance self-efficacy in a variety of domains. Verbal persuasion involves encouragement to engage in a target behavior or goal, and engagement in goal-directed activity (Lent, 2004). Given that one of the primary deficits in AD/HD is difficulty with sustained attention and goal-directed activity, coaching models may be particularly relevant in facilitating college self-efficacy and subsequent college adjustment and subjective well-being for this population. Students with AD/HD might particularly benefit from being provided with more structured counseling interventions, aimed at assisting them in formulating goals, anticipating barriers to goal progress, breaking down long-term assignments into more concrete short-term goals, and providing them with ongoing structured feedback regarding their goal progress to enhance college self-efficacy and self-esteem.

Overall, findings of this study not only expand many areas of relevant current research, but also have a wide range of implications for counseling and program development for students with AD/HD in the college setting. For example, while learning assistance services on campuses often provide general forms of academic support, such services might aim at developing such peer mentoring and academic coaching programs specifically tailored to the needs of students with AD/HD.

Also, given that faculty was highlighted as an important source of personal and academic support, programs and services might be aimed at better educating faculty about AD/HD, and the unique needs of students with AD/HD in the college setting. Furthermore, given that parents were also highlighted as important sources of personal and academic support, learning assistance services and counseling centers might aim to better educate parents about their changing roles in relation to students, and assisting them in finding ways to provide continued support for these students while fostering their independence. Finally, given the increased demands of the college environment that often provide many new challenges for students with AD/HD, programs might be developed to better prepare parents and students during grade school and high school to help them learn effective skills and strategies for managing their AD/HD symptoms that they could apply to the college environment. For example, parents and educators might apply coaching models in assisting students in grade school and high school in managing daily academic and personal challenges and tasks. Coaching models could then be continued and applied in the college environment with the assistance of learning assistance services, faculty, or counseling centers to facilitate students' progress and success in college.

*Limitations*

There are a number of important limitations to consider in interpreting the findings of the present study. For example, one limitation is the lack of random sampling of the participants. The sampling pool for the present study consisted solely of students with AD/HD registered at the University of Maryland Learning Assistance Service/Disability Support Service (LAS/DSS). Subsequently, the study sample only included students with AD/HD who had actively sought and registered for services and accommodations. This may have potentially biased the sample in a number of important ways.

For one, these sampling procedures may have biased the sample towards students with AD/HD who generally employ more active coping strategies in that they registered for support services (e.g., a tendency towards behavioral or psychological responses designed to change the nature of the stressor itself or how one thinks about it) (Folkman & Lazarus, 1980). This seems particularly salient given that self-efficacy theory (Bandura 1982, 1997) posits a mediating role of goal-directed action in the relationship between self-efficacy and health status outcomes, and also research which has suggested a mediating role of active coping strategies in the relationship between self-esteem and adjustment outcomes for college students (Aspinwall & Taylor, 1992). Perhaps AD/HD students registered with DSS may not only employ more active coping strategies, but may also be higher in self-esteem and college self-efficacy than the general AD/HD college student population (which may facilitate their active coping styles and strategies). Consistent with the hypotheses of the present study, it may also be that connecting with and utilizing campus support services may enhance college self-efficacy and self-esteem

for students with AD/HD. Subsequently, students in the sample might be generally higher functioning (e.g., in terms of self-esteem, college self-efficacy, and college adjustment) than the general AD/HD college student population. Along these lines, it is important to note that the average age at which participants reported that they had been diagnosed with AD/HD was 16.28 years ( $SD = 4.57$  years). While this may be considered a relatively older age of diagnosis (e.g., AD/HD is usually diagnosed in childhood), this relatively older age of diagnosis of the sample most likely reflects the higher functioning nature of AD/HD college students in relation to the general AD/HD population. In other words, it makes sense that individuals with AD/HD who are higher functioning (e.g., enter college) might be better able to compensate for their symptoms in earlier years, and not until faced with the increased demands of late adolescence and young adulthood do symptoms become apparent and interfere with many aspects of their functioning in different contexts, resulting in the AD/HD diagnosis.

Another related limitation of the present study was the low response rate of the sampling pool. More specifically, participants in the present study represented only 33% of the potential sampling pool (e.g., 80 out of 242 students with AD/HD registered with DSS that returned completed packets). This somewhat low response rate may perhaps be related to the nature of AD/HD symptomatology (e.g., often characterized by procrastination, poor time management, forgetfulness, etc.) which may have impeded many potential participants from completing and returning survey packets. Likewise, perhaps students who participated in the study may reflect an even higher functioning subgroup of students with AD/HD (e.g., higher in self-esteem, college self-efficacy, and college adjustment) as compared to the general pool of AD/HD students registered with



DSS, given that they were able to perhaps draw on personal resources to complete and return packets in spite of their AD/HD symptoms.

These potential sample biases seem particularly salient given that the means for self-esteem, college self-efficacy, and overall college adjustment for the sample in the present study were slightly lower, but likely not significantly lower than the roughly estimated means for these variables in samples of college students in general from some previous studies. Particularly in light of previous research (Dooling-Litfin & Rosen, 1997) which has demonstrated that college students with AD/HD tend to have significantly lower levels of self-esteem than their non-AD/HD peers, the sample in the present study may be representative of a somewhat higher functioning group of AD/HD students (e.g., higher in self-esteem, self-efficacy, and college adjustment), as compared to college students with AD/HD who do not seek support services and/or are able to draw on personal resources to complete and return survey packets.

It is important to note, however, that it is somewhat difficult to compare the sample in the present study to college students in general because normative data for the relevant variables for general college student samples is not available. In general, the means for self-esteem, college self-efficacy, and college adjustment for the present sample were somewhat lower than roughly estimated means for general college samples. What was most notable, however, in the present study was the greater variability in scores for many of the variables as evidenced by the larger standard deviations. Perhaps more accurate normative data on these variables for general college samples (and a larger sample size for the present study), would yield clearer differences between the means (of psychological and adjustment variables) for the present sample and college students in

general. Suggestions for ways that future research might address these issues are further discussed in the section on directions for future research.

Another limitation was that packets were sent, completed, and returned at different points during the semester, which may have biased student responses and confounded results. For example, students who completed packets at the beginning of the semester may have been experiencing less (or more) stress than towards the middle or end of the semester, depending on their academic and personal experiences in the college environment as they progressed through the semester.

Overall, while aspects of the sampling procedures and drawing from AD/HD students registered with DSS may have potentially biased the sample and data in some important ways, however, sampling only from students registered with DSS provided the advantage of having confirmation of the AD/HD diagnosis (and of any comorbid psychiatric diagnoses and/or specific learning disabilities), improving on the methodology of previous studies of college students with AD/HD. Moreover, sampling at different points during the semester allowed for a higher participation rate than might have been otherwise possible.

With regard to other limitations of the sampling procedures of the present study, all of the participants in the study were from one large northeastern university, and the sampling pool was predominantly Caucasian. These issues greatly limit the generalizability of the results of this study to college students demographically similar to those in this sample. For example, as Lent (2004) highlights, cross-cultural variations have been found in the predictors of the life satisfaction component of subjective well-being (Suh, Diener, Oishi, & Triandis, 1998). Also, self-esteem has been found to relate

to global life satisfaction more highly in individuals from individualistic versus collectivist cultures (Diener & Diener, 1995; Oishi, Diener, Lucas, & Suh, 1999). For students coming from a more traditionally individualistic cultural perspective (as was the sample in the present study), psychosocial variables such as self-efficacy and self-esteem may be more salient factors related to health status outcomes than for students coming from more traditionally collectivist cultures (i.e., Asian or African-American students). For college students with AD/HD from more traditionally collectivist cultures and value systems, other community related variables (such as one's sense of contribution to the larger community and harmony with others) may be more salient psychosocial predictors of life satisfaction and subsequent well-being and psychosocial adjustment in the college context.

Another limitation of the study was that all measures were based on self-report. The self-report nature of the measures could have potentially introduced a variety of confounds, such as social desirability, resulting in response bias. Also, a variety of other confounds based on personality factors may have been introduced by the self-report nature of the measures. For example, as Lent (2004) highlights, some studies have found moderate to large relations of personality variables (such as extraversion and neuroticism) to the affective dimension of subjective well-being (e.g., positive and negative affect) (McCrae & Costa, 1991; Watson & Clark, 1992). As Lent (2004) explains, the lack of a specified timeframe for participant ratings of subjective well-being results in estimates of more global life satisfaction which tend to be more trait-like in their temporal stability, and are related to personality traits such as extraversion and neuroticism (Diener et al., 1999). Some of the self-report measures (including the life

satisfaction measure) in this study did not specify a certain timeframe, and subsequently personality variables (e.g., such as levels of neuroticism) may have confounded self-report of the various constructs (including subjective well-being). Overall, given that all variables in the study were measured by single measures of self-report, a variety of potential confounding factors (including personality factors) could have been introduced, threatening the validity of the study.

Furthermore, as Lent (2004) explains, an inherent validity problem in the nature of assessment of subjective well-being (i.e., based on self-report) is that there is no objective criterion against which subjective well-being can be compared (Andrews & Robinson, 1991). Subjective well-being may influence the subjective perception of health, and subsequently inflate the correlation between subjective well-being and subjective health (Diener et al., 2002). Relying solely on self-report measures, the variables and findings of this study are limited to participants' perceptions. For example, while students' reports may be said to reflect personal subjective assessments of their subjective well-being, there is no measure of how well these students are actually functioning according to more objective external standards. This remains an ongoing challenge in the study of well-being (Lent, 2004).

Another related issue is the lack of empirical support in the current literature regarding the reliability and validity of the AD/HD symptomatology measure. While there are various established measures of AD/HD symptomatology in children (including parent and teacher report measures), there is currently a lack of consensus on the best way to assess AD/HD symptoms in adults (Nigg et al., 2002). While there is a lack of consensus in the literature, however, the AD/HD symptomatology measure used in this

study was based on DSM-IV AD/HD criteria, which have been established by previous research (DuPaul, Schaughency, Weyandt, Tripp, Kiesner, Ota, & Stenish, 2001; Turnock et al., 1998) to be applicable to college students. Moreover, as demonstrated by preliminary analyses, the internal consistency of the AD/HD symptoms measure used was found to be sufficient in this study.

#### *Directions for Future Research*

Given the findings and limitations of this study, there are a number of important and interesting directions for future research. First, future studies should aim to increase sampling participation and expand the generalizability of findings by applying random sampling methods to students with AD/HD from a wider range of demographic regions, universities, and within-university contexts. For example, by obtaining a random sample of students with AD/HD from universities across the country and perhaps abroad, findings would be more generalizable across demographic and cultural perspectives. Also, by randomly sampling students with AD/HD across a wider range of within-university contexts, potential confounding variables (such as personality factors and coping styles) contributing to self-selection for certain student support services might be better controlled.

Another interesting area for future research would also be to further explore demographic trends in the self-selection for campus support services. For example, given the predominantly Caucasian nature of the sample in the present study (and of students with AD/HD registered with DSS in general), it would be interesting to explore possible socioeconomic and cultural variables that might contribute to such trends (i.e., possible socioeconomic trends in students that get tested and diagnosed with AD/HD). Also,

given the high percentage of transfer students represented in the present study, it would be interesting to further explore factors contributing to possible trends in admissions and transfer status of students with AD/HD, as compared to the general college student population.

Furthermore, given findings of the exploratory analyses regarding group differences in subjective well-being among students with AD/HD based on comorbid psychiatric diagnoses (e.g., depression and/or anxiety), future studies might aim to further explore differences among AD/HD subgroups, and to better control for psychiatric and mood factors in light of the nature of the health status outcomes being assessed. One way to control for such factors in future research might be to limit inclusion criteria to students with AD/HD who have not been diagnosed with (or who do not meet criteria for) a comorbid psychiatric condition. Given the high prevalence of comorbid psychiatric conditions in individuals with AD/HD, however, it is likely that such restrictive inclusion criteria would greatly and artificially limit potential sample sizes in future studies (as would have been the case in this study). For example, given that mood dysregulation is often a common feature associated with AD/HD, and that many of the symptoms of mood dysregulation overlap with symptoms of AD/HD (e.g., inattention and restlessness), it would likely prove very difficult and undesirable to try and completely eliminate confounding psychiatric mood variables in sampling participants with AD/HD, even when eliminating participants with formal psychiatric diagnoses. Rather than excluding students with comorbid psychiatric conditions, therefore, future studies might aim to explore potential subgroup differences and/or to screen and control for psychiatric mood variables by administering additional measures of mood and

psychiatric factors (e.g., depression and anxiety inventories), controlling for such potential confounds in the statistical analyses.

Moreover, it is important to highlight that while significant group differences were found in levels of subjective well-being (e.g., the comorbid psychiatric AD/HD group SWB mean was significantly lower than the other two subgroups), no significant group differences were found in levels of college adjustment or in levels of the relevant predictor variables among the diagnostic subgroups in the exploratory analyses in this study. These findings further support the inclusion of participants with comorbid learning disabilities and psychiatric mood disorders in the present study, given that they did not differ from the rest of the sample relevant to the domain-specific health outcome and predictor variables. While it may be important to screen and control for confounding psychiatric mood variables relevant to more global and affect-related health status outcomes, future studies should carefully consider the nature of the health status outcomes being assessed relevant to inclusion criteria.

In addition to exploring potential differences among AD/HD comorbid diagnostic subgroups, future studies should also aim to explore possible differences in health status outcomes across AD/HD subtypes (e.g., the inattentive subtype, hyperactive subtype, and combined inattentive/hyperactive subtypes). Given that this researcher was unable to confirm the AD/HD subtypes of participants, variables and outcomes in the present study were examined across subtypes. Given that some research that has indicated differences in functioning and various academic outcomes across AD/HD subtypes (Barkley, 1998; Marshall & Hynd, 1997), however, this remains an important and interesting direction for future study. Along these lines, future research should also aim to further examine

potential differences in functioning between college students with AD/HD and their non-AD/HD peers. Moreover, studies aimed at developing more comprehensive normative data on self-esteem, college self-efficacy, and college adjustment for general college samples may also assist along these lines.

Another important direction for future research would be to find ways to improve upon the self-report aspect of the methodology of this study. For example, whereas this study solely relied on students' reports of their experience of subjective well-being and college student adjustment, future studies might aim to incorporate measures of social desirability and more external and objective measures of well-being and adaptation in the college environment (i.e., such as teacher report, grades, productive involvement in extracurricular activities, academic probation warnings, and/or honor roll status, etc.) This might serve to enhance the validity of the well-being construct, encompassing a wider range of aspects of well-being reflecting both hedonic and eudaimonic notions (Lent, 2004).

Similarly, the validity of measured levels of AD/HD symptomatology may also be facilitated by incorporating external reports (e.g., parent and teacher reports), consistent with the way AD/HD is normally diagnosed in childhood. Overall, by incorporating more objective and external measures of constructs, future research might greatly improve on the methodology of the present study (e.g., by further reducing threats to validity) and on current measurement approaches in the adolescent/adult AD/HD and well-being literature in general.

Also, future research might aim to assess well-being outcomes for students with AD/HD across various timeframes. Particularly given the correlation between



personality factors and more global measures of subjective well-being (e.g., over an unspecified timeframe) (Diener et al., 1999), such research might assist in further clarifying state and trait factors associated with well-being for students with AD/HD in the college context and in general. Along these lines, an important area for future research is to examine and compare the effectiveness of biomedical, psychosocial, and combined interventions in enhancing health status outcomes for college students with AD/HD. While the results of the present study support a biopsychosocial conceptualization and approach to facilitating health status outcomes for these students, research has yet to scientifically develop and empirically support the effectiveness of various psychosocial and combined interventions for this population, particularly in terms of retention and graduation rates for this population.

Furthermore, given the inherent necessity of including a limited number of variables in the biopsychosocial framework explored in this study, this line of research remains ripe for the exploration of more comprehensive models of the factors and influences on the well-being and college adjustment for students with AD/HD. For example, particularly given research that has demonstrated a relationship between personality factors and AD/HD symptom severity and more global assessments of subjective well-being, future research might incorporate salient personality variables (e.g., levels of neuroticism, dispositional optimism or pessimism) and protective factors (i.e., IQ levels) into models of health status outcomes for students with AD/HD. In addition, given that self-esteem and college self-efficacy were found to partially mediate the effects of social support on health status outcomes in this sample, future research

might explore other potential mediating factors and pathways by which social support may relate to well-being in these students.

For example, given extensive research which has demonstrated a relationship between active coping strategies and a variety of health status outcomes across populations (Holahan & Moos, 1987), future research might examine the mediating effects of coping strategies on the relationship between psychosocial variables and health status outcomes for students with AD/HD. Also, the facilitation and effects of goal pursuit and progress may be a particularly relevant pathway to explore for this population, given the nature of AD/HD symptomatology and its impact on sustained attention.

Finally, future research might aim to explore biopsychosocial influences on more specific aspects of the more general health status outcomes measured in this study. For example, while overall college adjustment was measured in this study, different aspects of biopsychosocial variables may relate to various aspects of college adjustment (i.e., academic, social, personal-emotional, and goal commitment-institutional adjustment) in different ways. Also, future research might aim to explore the relationship between biopsychosocial factors and pathways related to various aspects of well-being (i.e., encompassing hedonic and eudaimonic notions). Longitudinal research exploring how such relationships and pathways may operate and interact to affect health status outcomes for students with AD/HD over the course of their college experience might also help further inform directions for more effective preventive and psychosocial interventions with this population.

In sum, this study sought to simultaneously examine multiple biopsychosocial factors related to the subjective well-being and college adjustment of students with diagnosed AD/HD. In applying a biopsychosocial framework, it sought to further clarify the factors and pathways facilitating health status outcomes and optimal adjustment for this population. In doing so, this study expands current literature on late adolescent and adult AD/HD, college adjustment, and well-being. Despite its methodological shortcomings, results of this study suggest many possibilities for more effective preventive and psychosocial intervention for this population of college students. Moreover, results suggest many ripe areas for future research on biopsychosocial models of health status and adjustment outcomes for college students with AD/HD, consistent with the hygiological mission of counseling psychology.



Do you currently use any prescribed medications to manage your AD/HD symptoms?

\_\_\_ Yes \_\_\_ No

(If yes, please indicate type of medication and dosage/frequency

with which you use the medication: \_\_\_\_\_

Please indicate the **sources, and frequency/intensity of *academic* (i.e., help with managing time, work, and classes) and *personal/emotional support*** that you experience from the sources below in managing your personal and academic life in college:

**a) ACADEMIC SUPPORT** (i.e., help with managing time, work, classes, etc.):

**Source of support      Frequency/Intensity of *Academic* Support provided by source:**

	<u>No support</u>	<u>Some support</u>	<u>A lot of support</u>
<b>Parents</b>	_____	_____	_____
<b>Friends</b>	_____	_____	_____
<b>Faculty/Academic Advisor(s)</b>	_____	_____	_____
<b>Learning Assistance/ Disability Svcs.</b>	_____	_____	_____
<b>Other (Please specify: _____</b>	_____	_____	_____

**b) PERSONAL/EMOTIONAL SUPPORT** (i.e., help with emotional and social issues):

**Source of support      Frequency/Intensity of *Personal/Emotional* Support provided by source:**

	<u>No support</u>	<u>Some support</u>	<u>A lot of support</u>
<b>Parents</b>	_____	_____	_____
<b>Friends</b>	_____	_____	_____
<b>Faculty/Academic Advisor(s)</b>	_____	_____	_____
<b>Learning Assistance/ Disability Svcs.</b>	_____	_____	_____

**Other (Please specify:**

\_\_\_\_\_

\*\*If you utilize Learning Assistance and/or Disability Support Services, please specify the nature and frequency of use of these services below (circle number to indicate frequency of use):

	<u>Never</u>	<u>Sometimes</u>	<u>Regularly</u>
<b>Testing Services</b> (i.e., extra time, private room, etc.)	_____	_____	_____
<b>Reading Services</b> (i.e., books on tape, enlarged print, etc.)	_____	_____	_____
<b>Individual or group <u>Academic</u> Counseling/Coaching</b> (i.e., meet with individual counselor or group for help with time management, study skills, etc.)	_____	_____	_____
<b>Individual Personal/Emotional Counseling</b> (i.e., meet with individual or group counseling services for support with personal emotional issues)	_____	_____	_____
<b>Other (Please specify any other Learning Assistance/ Disability Support Services that you use and frequency of use): Service:</b> _____			

## Appendix B

## AD/HD Current Symptoms Scale- Self-Report Form

Barkley, R.A., &amp; Murphy, K.R. (1998)

**Instructions:** Please circle the number next to each item that best describes your experience and behavior during the past 6 months.

<i>Items:</i>	Never <i>or rarely</i>	Sometimes	Often	Very <i>often</i>
1. Fail to give close attention to details or make careless mistakes in my work	0	1	2	3
2. Fidget with hands or feet or squirm in seat	0	1	2	3
3. Have difficulty sustaining my attention in tasks or fun activities	0	1	2	3
4. Leave my seat in situations in which seating is expected	0	1	2	3
5. Don't listen when spoken to directly	0	1	2	3
6. Feel restless	0	1	2	3
7. Don't follow through on instructions and fail to finish work	0	1	2	3
8. Have difficulty engaging in leisure activities or doing fun things quietly	0	1	2	3
9. Have difficulty organizing tasks or activities	0	1	2	3
10. Feel "on the go" or "driven by a motor"	0	1	2	3
11. Avoid, dislike, or am reluctant to engage in work that requires sustained mental effort	0	1	2	3
12. Talk excessively	0	1	2	3
13. Lose things necessary for tasks or activities	0	1	2	3
14. Blur out answers before questions have been completed	0	1	2	3
15. Am easily distracted	0	1	2	3
16. Have difficulty awaiting turn	0	1	2	3
17. Am forgetful in daily activities	0	1	2	3
18. Interrupt or intrude on others	0	1	2	3

Barkley, R. A., & Murphy, K. R. (1998). *Attention-deficit hyperactivity disorder: A clinical*

*workbook*. New York: Guilford Press.

## Appendix C

## Rosenberg Self-Esteem Scale

*Rosenberg, M. (1965)*

**Instructions:** Below is a list of statements dealing with your general feelings about yourself. If you **strongly agree**, circle **SA**. If you **agree** with the statement, circle **A**. If you disagree, circle **D**. If you strongly disagree, circle **SD**.

	<b>1</b> <b>strongly</b> <b>agree</b>	<b>2</b> <b>agree</b>	<b>3</b> <b>disagree</b>	<b>4</b> <b>strongly</b> <b>disagree</b>
1. I feel that I'm a person of worth, at least on an equal plane with others	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>
2. I feel that I have a number of good qualities	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>
3. All in all, I am inclined to feel like a failure	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>
4. I am able to do things as well as most other people	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>
5. I feel I do not have much to be proud of	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>
6. I take a positive attitude towards myself	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>
7. On the whole, I am satisfied with myself	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>
8. I wish I could have more respect for myself	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>
9. I certainly feel useless at times	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>
10. At times I think I am no good at all	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>

Rosenberg, M. (1965). The measurement of self-esteem. In *Society and the adolescent self-image*

(pp. 16-35). New Jersey, NJ: Princeton University Press.



## Appendix D

College Self-Efficacy Scale  
*Solberg et al. (1993)*

Please rate how confident you are that you could successfully complete the following tasks:

	<b>Not at all confident</b>									<b>Extremely confident</b>
	0	1	2	3	4	5	6	7	8	9
1) Make new friends at college	0	1	2	3	4	5	6	7	8	9
2) Talk to your professors	0	1	2	3	4	5	6	7	8	9
3) Take good class notes	0	1	2	3	4	5	6	7	8	9
4) Divide chores with your roommate(s)	0	1	2	3	4	5	6	7	8	9
5) Research a term paper	0	1	2	3	4	5	6	7	8	9
6) Join an intramural sports team	0	1	2	3	4	5	6	7	8	9
7) Understand your textbooks	0	1	2	3	4	5	6	7	8	9
8) Get a date when you want one	0	1	2	3	4	5	6	7	8	9
9) Ask a professor a question outside of class	0	1	2	3	4	5	6	7	8	9
10) Get along with your roommate(s)	0	1	2	3	4	5	6	7	8	9
11) Write course papers	0	1	2	3	4	5	6	7	8	9
12) Socialize with your roommate(s)	0	1	2	3	4	5	6	7	8	9
13) Do well on your exams	0	1	2	3	4	5	6	7	8	9
14) Talk to university staff	0	1	2	3	4	5	6	7	8	9
15) Manage time effectively	0	1	2	3	4	5	6	7	8	9
16) Join a student organization	0	1	2	3	4	5	6	7	8	9
17) Ask a question in class	0	1	2	3	4	5	6	7	8	9
18) Divide space in your apartment/room	0	1	2	3	4	5	6	7	8	9
19) Participate in class discussions	0	1	2	3	4	5	6	7	8	9
20) Keep up to date with your schoolwork	0	1	2	3	4	5	6	7	8	9

Solberg, S., O'Brien, K., Villareal, P., Kennel, R., & Davis, B. (1993). Self-efficacy and hispanic college students: Validation of the self-efficacy instrument. *Hispanic Journal of Behavioral Sciences*, 15(1), 80-95.

## Appendix E

Social Provisions Scale  
*Cutrona, C. E., & Russell, D. (1987)*

**Instructions:** In answering the following questions, think about your current relationships with friends, family members, co-workers, community members, and so on. Then indicate by circling the correct number, to what extent each statement describes your current relationships with other people. Use the following scale to give your opinions.

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
	<b>Strongly Disagree</b>			<b>Strongly Agree</b>
1) There are other people I can depend on to help me if I really need it.	1	2	3	4
2) I feel that I do not have close personal relationships with others.	1	2	3	4
3) There is no one I can turn to for guidance in times of stress.	1	2	3	4
4) There are people who depend on me for help.	1	2	3	4
5) There are people who enjoy the same social activities I do.	1	2	3	4
6) Other people do not view me as competent	1	2	3	4
7) I feel personally responsible for the well-being of another person.	1	2	3	4
8) I feel part of a group of people who share my attitudes and beliefs.	1	2	3	4
9) I do not think other people respect my skills and abilities.	1	2	3	4
10) If something went wrong, no one would come to my assistance.	1	2	3	4
11) I have close relationships that provide me with a sense of emotional security and well-being.	1	2	3	4
12) There is someone I could talk to about important decisions in my life.	1	2	3	4
13) I have relationships where my competence and skills are recognized.	1	2	3	4
14) There is no one who shares my interests and concerns.	1	2	3	4
15) There is no one who really relies on me for their well-being.	1	2	3	4
16) There is a trustworthy person I could turn to for advice if I were having problems.	1	2	3	4
17) I feel a strong emotional bond with at				

least one other person.	1	2	3	4
18) There is no one I can depend on for aid if I really need it.	1	2	3	4
19) There is no one I feel comfortable talking about my problems with.	1	2	3	4
20) There are people who admire my talents and abilities.	1	2	3	4
21) I lack a feeling of intimacy with another person.	1	2	3	4
22) There is no one who likes the things I do.	1	2	3	4
23) There are people I can count on in an emergency.	1	2	3	4
24) No one needs me to care for them.	1	2	3	4

Cutrona, C. E., & Russell, D. (1987). The provisions of social relationships and adaptation to stress. In W. H. Jones & D. Perlman (Eds.), *Advances in personal relationships* (Vol. 1, pp. 37-67). Greenwich, CT: JAI Press.

## Appendix F

## Satisfaction with Life Scale

*Diener et al. (1985)*

**Instructions:** Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number on the line following that item. The 7-point scale is:

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>strongly agree</b>	<b>disagree</b>	<b>slightly disagree</b>	<b>neither agree nor disagree</b>	<b>slightly agree</b>	<b>agree</b>	<b>strongly agree</b>

1. In most ways my life is close to my ideal. \_\_\_\_\_
  2. The conditions of my life are excellent. \_\_\_\_\_
  3. I am satisfied with my life. \_\_\_\_\_
  4. So far I have gotten the important things I want in life. \_\_\_\_\_
  5. If I could live my life over, I would change almost nothing. \_\_\_\_\_
- 

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale.

*Journal of Personality Assessment, 49, 71-75.*



## Appendix H

## Informed Consent

**Please read carefully the following terms of consent:**

This study includes questionnaires about my AD/HD diagnosis and experience in the college environment.

I will be asked only to complete questionnaires about issues that pertain to me. I understand that my participation in this research is voluntary, and that I am free to stop participating at any point without penalty.

The data gathered in this study will be treated confidentially. The data will be stored with a code number. Although it is conceivable that the researcher could identify me in relation to my responses, I understand that the researcher will not use the information for that purpose. I understand that my responses will in no way affect my eligibility or receipt of any services and/or accommodations through the Learning Assistance Service and/or Disability Support Service.

I understand that there are no other known risks associated with participation in this study. The benefits of this study are intended to help the investigators learn more about how AD/HD college students function, which may inform the development of services to assist students with AD/HD.

Agree \_\_\_\_\_

## Appendix I

## Introduction Letter

Dear Student,

Hello, my name is Mary Beth Malone, and I am a graduate student conducting a dissertation research study examining factors associated with the adjustment and well-being of undergraduate students with AD/HD. I would like to invite you to participate in the study. Potential benefits for your participation include \$5 for a completed and returned survey packet (e.g., by campus or regular mail in the stamped envelope provided). If you complete and return the survey within two weeks, you will also be entered into a raffle for \$50. Please consider participating in this study, as your responses may help inform services and program development for students with AD/HD. Please also know, however, that your decision to participate or not participate will in no way affect your access to or receipt of any services and/or accommodations on campus.

If you decide that you would like to participate in the study, please read and sign the attached consent form, complete the attached surveys, and return the completed packet by mail (via campus or regular mail) in the envelope provided. Thank you for considering participating in this study, and please feel free to contact me if you have any questions.

Sincerely,

Mary Beth Malone, M.A.

e-mail: [mm359@umail.umd.edu](mailto:mm359@umail.umd.edu)

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