

Old Dominion University

## ODU Digital Commons

---

Theses and Dissertations in Urban Services -  
Urban Education

College of Education & Professional Studies  
(Darden)

---

Spring 2005

# Assessing the Relationship Between Adult Attention Deficit Disorder Symptoms and Freshman Survey Academic Probation Scores for Use in Developing Counseling Programs for Academically at Risk College Students

Douglas Joe Muller  
*Old Dominion University*

Follow this and additional works at: [https://digitalcommons.odu.edu/urbanservices\\_education\\_etds](https://digitalcommons.odu.edu/urbanservices_education_etds)



Part of the [Academic Advising Commons](#), and the [Higher Education Commons](#)

---

### Recommended Citation

Muller, Douglas J.. "Assessing the Relationship Between Adult Attention Deficit Disorder Symptoms and Freshman Survey Academic Probation Scores for Use in Developing Counseling Programs for Academically at Risk College Students" (2005). Doctor of Philosophy (PhD), Dissertation, , Old Dominion University, DOI: 10.25777/j05c-6575  
[https://digitalcommons.odu.edu/urbanservices\\_education\\_etds/80](https://digitalcommons.odu.edu/urbanservices_education_etds/80)

This Dissertation is brought to you for free and open access by the College of Education & Professional Studies (Darden) at ODU Digital Commons. It has been accepted for inclusion in Theses and Dissertations in Urban Services - Urban Education by an authorized administrator of ODU Digital Commons. For more information, please contact [digitalcommons@odu.edu](mailto:digitalcommons@odu.edu).

**ASSESSING THE RELATIONSHIP BETWEEN ADULT ATTENTION DEFICIT  
DISORDER SYMPTOMS AND FRESHMAN SURVEY ACADEMIC  
PROBATION SCORES FOR USE IN DEVELOPING COUNSELING  
PROGRAMS FOR ACADEMICALLY AT RISK COLLEGE STUDENTS**

by

Douglas Joe Muller  
B.S. May 1972, University of North Dakota  
M.A. August 1979, Chapman College  
M.S.W. May 1997, Norfolk State University

A Dissertation Submitted to the Faculty of  
Old Dominion University in Partial Fulfillment of the  
Requirement for the Degree of

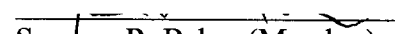
DOCTOR OF PHILOSOPHY

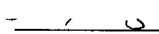
URBAN SERVICES/URBAN EDUCATION CONCENTRATION

OLD DOMINION UNIVERSITY  
May 2005

Approved by:

  
\_\_\_\_\_  
Dana D. Burnett (Director)

  
\_\_\_\_\_  
Spencer R. Baker (Member)

  
\_\_\_\_\_  
Leigh L. Butler (Member)

## ABSTRACT

### ASSESSING THE RELATIONSHIP BETWEEN ADULT ATTENTION DEFICIT DISORDER SYMPTOMS AND FRESHMAN SURVEY ACADEMIC PROBATION SCORES FOR USE IN DEVELOPING COUNSELING PROGRAMS FOR ACADEMICALLY AT RISK COLLEGE STUDENTS

Douglas Joe Muller  
Old Dominion University, 2005  
Director: Dr. Dana Burnett

This study identified a significant relationship between Adult Attention Deficit Disorder (Adult ADD) characteristics and the Old Dominion University Freshman Survey Probation Score. The Probation Score is used to identify potential academically at risk freshmen students. Academically at risk is defined as those students with less than a 2.0 GPA. The research found that as the number and severity of Adult ADD characteristics increased, as measured utilizing the Brown Adult ADD Scales, the higher the Probation Score. The study also identified a significant negative relationship between Adult ADD characteristics, as measured utilizing the Brown Adult ADD Scales, and GPA of a college student population. In addition, the research found a higher prevalence of significant Adult ADD characteristics and previously diagnosed ADHD/ADD students than has prior research in a college student population, with minorities underrepresented in both these areas.

These results can be used for the development of specialized counseling for college students with significant Adult ADD characteristics in conjunction with early intervention programs for academically at risk students. Identification and treatment programs, for students with significant characteristics or diagnosed with Adult ADD and who are having academic difficulties, can improve academic quality and retention.

## TABLE OF CONTENTS

	Page
LIST OF TABLES.....	v
I. INTRODUCTION	
BACKGROUND.....	1
OVERVIEW OF ADHD CHARACTERISTICS.....	4
DEFINITION OF TERMS.....	11
RESEARCH QUESTIONS AND HYPOTHESES.....	14
LIMITATIONS.....	16
SUMMARY.....	18
II. REVIEW OF THE LITERATURE	
ADULT ADD AND SYMPTOMS.....	21
AGE CRITERIA.....	26
COMORBID DISORDERS AND OVERLAPPING SYMPTOMS.....	38
ADD AND LEARNING DISABILITIES.....	43
ETHNICITY AND GENDER ISSUES.....	48
ADULT ADD AND COLLEGE STUDENTS.....	56
COLLEGE RETENTION.....	63
COUNSELING ISSUES.....	70
SUMMARY.....	74
III. METHOD	
PURPOSE.....	76
OVERVIEW.....	77
INSTRUMENTS.....	78
LIMITATIONS.....	83
SAMPLE POPULATION.....	86
RESEARCH: DISCUSSION AND PURPOSE.....	86
PROCEDURE.....	87
IV. FINDINGS	
REVIEW OF DATA COLLECTION METHODOLOGY.....	88
RESPONDENTS.....	89
RESPONDENT'S DEMOGRAPHICS.....	90
STATISTICAL ANALYSIS.....	92
ADD SCALE AND PROBATION SCORE.....	94
ADD SCALE AND GPA.....	95
CONTROLLING FOR PROBATION SCORE.....	96
ADD REPRESENTATION.....	99
DISCUSSION OF THE DIFFERENT SAMPLE SIZES.....	101
BROWN ADD SUB-SCALES.....	103
BROWN ADD SUB-SCALES STATISTICAL ANALYSIS.....	105
ADULT ADD CHARACTERISTICS IN THE SAMPLE POPULATION.....	107
SUMMARY.....	108

V. SUMMARY, CONCLUSIONS, RECOMMENDATIONS	
SUMMARY.....	110
LIMITATIONS.....	114
DISCUSSION.....	116
RECOMMENDATIONS.....	120
CONCLUSIONS.....	122
REFERENCES.....	124
VITA.....	142

## LIST OF TABLES

TABLE	Page
1. Overview of Data.....	90
2. Selected Demographics-Ethnicity.....	91
3. Selected Demographics-Age.....	92
4. ADD and Probation Scores Statistics.....	95
5. ADD and GPA Scores Statistics.....	96
6. GPA, Probation, and ADD Scores Statistics.....	97
7. Correlation Statistics.....	98
8. Controlled Variable: Probation Scores.....	99
9. Brown ADD Scales Scores Greater than 55.....	101
10. Descriptive Statistics.....	103
11. Sub-scale Statistics.....	107

## CHAPTER I

### INTRODUCTION

#### BACKGROUND

Until recently, Attention Deficit/Hyperactivity Disorder (ADHD) was considered only a childhood disorder (Weiss, Hechtman, Milroy, & Perlman, 1985). Boys who were disruptive in school and labeled as hyperactive were the most commonly identified individuals with this disorder (Hechtman, Weiss, Perlman, & Amsel, 1984). Children who were diagnosed with ADHD were often placed on a stimulant and were expected to remain on medication until, it was assumed, their symptoms disappeared by the end of puberty (Faigel, 1995). Research, however, has demonstrated that this is not the case. ADHD now is viewed as a mental health disorder (Barkley, 2000) that affects 5% of all children and adolescents of both genders. The symptoms for over 50 - 65% of these individuals continue into adulthood. The adult symptoms often are not seen as hyperactivity but rather as inattention symptoms, known as Adult Attention Deficit Disorder (Brown, 2000). The impairments in cognitive functioning associated with Attention Deficit Disorder (ADD) may cause chronic problems in the ability to complete an education, keep a job, or maintain a relationship. ADD is considered the second most common disability (Faigel, 1995) among young adults and college students, yet often it is misunderstood and under diagnosed.

ADD in college students is a serious concern in that all the core symptoms of Adult ADD have an impact on academics (Quinn, 2001). Attention problems create difficulty in initiating tasks or assignments, as well as in completing them. Students with ADD often wait until the last minute, using this stress as their main motivation in

completing assignments, which results in poor study habits. They often are disorganized or forget to do assignments. Easily distracted, students with ADD often jump from one topic to another, focusing on the less important task without completing the original assignment. Students with ADD typically have the most trouble with concentration and attention when taking a class or performing a task that is not interesting to them (Weiss, 1997). Students (Javorky & Gussin, 1994) may have problems taking notes rapidly, outlining, and taking timed tests. They may also have difficulty skimming articles for the main points and are unable to integrate information from several sources. Students with ADD characteristics often do poorly in lecture classes that have little opportunity for discussion. They have fewer problems with activities and classes that they find interesting. Dropout rates for students with ADD symptoms tend to be higher than for students without ADD symptoms. Research shows (Turnock, Rosen, & Kaminski, 1998) a correlation between a higher number of ADD symptoms for a college student and an increased risk that the student will drop out of college.

An additional problem for students with ADD is the possibility of a co-occurring condition of a learning disability. Depending on the definition of learning disability used, 25 - 33% of individuals with ADD (Ingersoll & Goldstein, 1993) are considered to have some form of learning disability. When using the criteria of a 20-point discrepancy between intelligence test scores and achievement test scores to define a learning disability then 19 - 26% of individuals with ADD, compared to 10% for the general population, have a learning disability.

Purdue University's Adaptive Programs, which are available for students with ADHD, are developed specifically to address this problem (Attention Deficit and



Hyperactive Disorder, 2002). The purpose of the Adaptive Programs is to provide services to eligible students that enable and encourage students with disabilities to seek success in their intellectual and personal development. For the incoming freshman student with ADHD to be eligible for the Adaptive Programs, the documentation of ADHD symptoms must include a specific diagnosis of ADHD and any comorbid diagnosis. The documentation must include the functional limitations of a student with ADHD, the impact on the student, and how the symptoms impair educational performance. Documentation needs to include evidence of childhood impairment as well as current impairment, and its impact on education such as school grades and disciplinary actions. The college also requires statements that rule out alternative diagnoses that may otherwise explain the symptoms. Documentation must include statements that describe the frequency and intensity of the symptoms, such as procrastination, disorganization, distractibility, restlessness, boredom, academic underachievement, low self-esteem, and chronic tardiness or nonappearance. The documentation must also reflect the impact of ADHD on one or more major life activities. Documentation of statements is required concerning the past and current use of medications and therapy in the treatment of ADHD symptoms. Also to be included in the documentation are clinical assessment reports and the instruments used in the diagnosis of ADHD, such as the Wender Utah Rating Scale, the Barkley Self-Rating Symptom Checklist for ADHD Adults, the Copeland Symptom Checklist for Adult Attention Deficit Disorders, Conners' Adult Rating Scales or the Brown ADD Scales - Adult.

On a larger scale than Purdue University's Adaptive Programs is Landmark College. It is the only accredited college that is designed exclusively for students with

learning disabilities, dyslexia, and ADHD (Landmark College, 2003). Landmark College was founded in 1983, due to the increasing prevalence of learning disabilities among American students. Students learn skills and strategies through individualized attention from classroom instructors and courses designed to meet their educational needs. It is the college's philosophy that bright students who learn differently also learn well once they have mastered the information processing strategies they require. Students have the opportunity to obtain an Associate's Degree and also the necessary educational training to succeed in a four-year college, in graduate school, or in the workforce.

A cure to a problem cannot be resolved or even addressed, however, until the problem is first identified. Purdue University's Adaptive Programs as well, as Landmark College, while extremely important in the education of students with learning disabilities and ADHD, are only effective if an individual already has an identified and documented history of ADHD symptoms. Mandatory counseling programs for those students who are academically at risk are also important but limited if the problem that is causing the academic difficulty is unknown. Therefore, the awareness of the impact of ADD on college students recognized by programs such as those at Purdue University and Landmark College, and the positive results of mandatory counseling for academically at risk students, could benefit both the students and universities if combined and utilized in a single program.

## OVERVIEW OF ADHD CHARACTERISTICS

The *DSM-IV-TR* (2000) is a method of classifying mental disorders that is designed as a tool for communication in clinical, educational, and research settings. The *DSM-IV-TR* is intended to provide descriptions of diagnostic categories to enable

clinicians not only to diagnose but also to have a common language with which to study and treat those with mental disorders. The criteria offered for each diagnostic category are designed only as guidelines and are a consensus of available information and not intended as absolutes. Attention Deficit/Hyperactivity Disorder is described in the *DSM-IV-TR* as a persistent pattern of inattention and/or hyperactivity-impulsivity. These symptoms must be present before the age of seven, though individuals often are diagnosed much later. There must be some impairment from these symptoms in at least two settings, such as home, school or work, with evidence of interference in social, academic, or occupational development. Inattention may be seen in academic, occupational, and social settings where the individual has difficulty paying attention to tasks or failing to complete assignments. Individuals with ADD characteristics may appear to be not listening, staring into space, or frequently jumping from one uncompleted task to another. They often have difficulty organizing activities and tasks and, as a result, avoid those activities that require self-application, organizational demands, or good concentration. Work habits often are disorganized and materials used for tasks may be scattered, lost, or damaged. Individuals with ADD characteristics often are easily distracted by external stimuli and frequently interrupt their current tasks due to background noises or events. They may also miss appointments or forget simple tasks in their daily patterns. In conversations, they may shift from one subject to another or from person to person as if not paying attention. Individuals with ADD characteristics may be impulsive or seem impatient and have difficulty in delaying responses. They often engage in dangerous activities without thought of their consequences. It is estimated that ADHD affects 3 - 7% of school age children (*DSM-IV-TR*, 2000). Data on adolescents and adults are limited. It is considered to be

more prevalent in males than females, ranging from 2:1 to 9:1. Parents may be the first to see the symptoms when their children are toddlers, during their development of independent locomotion, but the disorder is usually first diagnosed during the elementary school years, due to the child's inability to adjust to this setting. In most individuals, the disorder is considered to remain stable through the adolescent years while decreasing in late adolescence and adulthood, though a minority of individuals continues with the full range of symptoms into mid-adulthood.

In the past, the symptoms currently listed as criteria for Attention Deficit/Hyperactivity Disorder have been called by a variety of names: Minimal Brain Damage, Minimal Brain Dysfunction, Minimal Cerebral Dysfunction, Minor Cerebral Dysfunction, Hyperkinetic Child Syndrome, Hyperkinetic Syndrome, Hyperactive Child Syndrome, and Attention Deficit Disorder With or Without Hyperactivity (Triolo, 1999). ADHD-like symptoms were first noticed in children who survived the 1917-1918 encephalitis epidemic. The children displayed behavioral and cognitive symptoms, resulting in the first relationship recognized between ADHD and brain damage. Later, when similarities between ADHD-like behaviors and brain infection or injury were found, it was presumed that these children that had ADHD symptoms must have had earlier childhood brain trauma. This resulted in a series of minimal brain damage diagnoses and classifications. The perception of ADHD-like symptoms continued to evolve, and in the 1960s, an acceptance of environmental influences supported by behavioral observations led to the next trend of hyperactivity criteria and hyperkinetic disorders. But though ADHD-like symptoms changed, ADHD remained a childhood disorder. In the 1980s the shift to include these symptoms as a life-long condition was supported by the *Diagnostic*

*Statistical Manual of Mental Disorders-Third Edition (DSM-III)*. The *DSM-III* included new categories: Attention Deficit Disorder with Hyperactivity; Attention Deficit Disorder without Hyperactivity; and Attention Deficit Disorder, Residual Type. These symptoms of inappropriate inattention, impulsivity, and hyperactivity were usually identified by a teacher or parent in children between the ages of eight and ten. However if conflict in reporting occurred between the teacher and the parent, the teacher's observation was given primary consideration due to the teacher's awareness of age-appropriate norms. The *DSM-III* identified three different characteristic courses of ADHD. The three possible characteristics of ADD symptoms are that the symptoms persist into adolescence or adulthood, that all the symptoms disappear at puberty, or that the hyperactivity disappears but the attention and impulsivity symptoms continue into adolescence or adulthood. Though the symptoms finally were acknowledged to remain into adult life, Attention Deficit Disorder (ADD) remained an infancy, childhood or adolescence disorder with no criteria to diagnose adult symptoms. With the publication of the *Diagnostic Statistical Manual of Mental Disorders-Third Edition-Revised (DSM-III-R)*, the symptoms of inappropriate degrees of inattention, impulsiveness, and hyperactivity were now consolidated under a single condition, Attention-deficit Hyperactivity Disorder (ADHD). The *DSM-III-R* stated that ADHD symptoms usually appeared in more than one environment, such as at school, at home, or in social situations, but some individuals only showed symptoms in a single setting. Though the onset of these symptoms often occurred before the age of four, to meet criteria for ADHD, the onset of symptoms must be before the age of seven. Symptoms of the disorder often were considered absent in one-on-one situations, such as in the clinician's office or while playing video games. The primary

settings for the increase in symptoms were while listening to a teacher, attending meetings, doing classroom assignments, or doing chores at home. The main complications remained problems at school and led to school failure. The symptoms were considered to continue through childhood, while as much as a third of the individuals were expected to continue to show ADHD symptoms into adulthood. ADHD remained to be considered a disorder usually first evident in infancy, childhood, or adolescence, with no criteria to identify adult symptoms (Triolo, 1999).

In spite of the changing criteria of ADHD-like symptoms over the years, the diagnosis for inattention remains linked to hyperactive/impulsive behavior (Brown, 2000). This linkage was due to early studies of children who were hyperactive and disruptive in school. The criteria listed for ADHD in the *DSM-III* constituted the first time inattention symptoms, rather than hyperactivity, were identified as the core feature. The name of this disorder changed from Hyperkinetic Reaction of Childhood to Attention Deficit Disorder With or Without Hyperactivity. But this advancement was lost with the *DSM-III-R* when the diagnostic criteria for Attention Deficit Disorder was dropped and the inattentive symptoms were combined with the hyperactivity and impulsivity symptoms into a single condition, Attention-deficit Hyperactivity Disorder. When the *Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV)* was published, the inattentive symptoms again returned as a separate form of Attention Deficit/Hyperactivity Disorder, as the Predominately Inattentive Type, without the requirement for hyperactivity or impulsivity symptoms. The slash between ‘attention deficit’ and ‘hyperactivity’ was added to refer to the different core symptoms in this hybrid disorder. In spite of this change, literature continued to link attention impairments with hyperactive and impulsive behavior.

Therefore, individuals whose primary dysfunction was due to attention impairment with no hyperactivity or impulsive behavior remained less likely to be correctly recognized as ADHD (Brown, 2000).

Research and clinical studies used in its development, the *Diagnostic Statistical Manual, Fourth Edition, Text Revised* (DSM-IV-TR) (2000) lists three core symptoms that children and adolescents with ADHD exhibit in different environments. These core symptoms are inattention, hyperactivity, and impulsivity, with each symptom having a set number of required behaviors for that specific symptom's criteria. Disinhibition, which is the inability to plan, control, and manage one's own behavior (Teeter, 1998), may be the most important for differentiating between those with ADHD and those without ADHD. This same information is not only pertinent to the identification of ADD symptoms and appropriate diagnosis (Shaywitz & Shaywitz, 1989) but also to the way referrals are made for treatment. When the primary focus is on hyperactivity, and a behavioral problem is used as the main symptom, individuals are more likely to be referred to psychiatrists and mental health centers. But when the primary focus is attention deficits, poor schoolwork, or learning difficulties, the student is more likely to be referred to pediatricians and learning disorder centers.

ADD has been a diagnosed mental health disorder for a number of decades, but the focus of the research has mainly involved Caucasian subjects. In a review of thousands of articles on ADD covering 30 years between 1965 and 1995, Samuel, et al. (1997) found that none of the articles involved adult African-American characteristics. A result of this lack of research on ethnicity and ADD (Barkley, 1998) is that the disorder often is viewed as only affecting middle-class Caucasians. The lack of documentation of research on

ethnicity and its impact on ADD characteristics suggests an area of need for research that may benefit the identification and treatment of ethnic groups and their possible unique ADD characteristics.

Gaub and Carlson (1997), in their review of available studies between 1985 and 1994 of gender differences, found only 18 addressing ADD characteristics. The research discovered that though the ratio of male-to-female prevalence is 9:1, and 6:1 in the population referred to clinics for evaluation, the ratio is 3:1 from community samples. This suggests that the lower rate of referrals for females is a neglected treatment area. The differences in ratios may be a result of different ADD characteristics between males and females. Females with ADD characteristics, relative to males with ADD characteristics, show lower levels of hyperactivity, fewer conduct disorders, and lower rates of other externalizing behavior but greater intellectual impairment. The differences in characteristics suggest the reason that more males than females are referred to clinics. This is due to the higher rates of conduct disorders and other externalizing problems that females with ADD characteristics do not display. This supports a study by Biederman, et al. (2002), which found females with ADD characteristics that were referred to a clinic were more likely to have the inattentive type of ADD than males but were less likely to have a learning disability or other problems in school. At a training conference in Washington, D.C., Nadeau (personal communication, September 23, 2000) supported the concept that the under diagnosing of females is due to the fact that girls do not display the hyperactivity characteristics of ADHD but rather the inattentive ADD characteristics. She suggests that, due to the diagnostic criteria of ADHD being based currently on clinic referred males, females are undiagnosed and struggle with academic underachievement.



## PURPOSE

The purpose of this study is to determine if there is a relationship in college students between the number and intensity of Adult Attention Deficit Disorder symptoms and the students' Old Dominion University Freshman Survey Probation Scores. The purpose of investigating a possible relationship between Adult ADD symptoms and the Old Dominion University Freshman Survey Probation Scores is to determine if there is the need for identification of Adult ADD symptoms in order to develop specialized counseling programs to improve student academic success. Identifying a potential problem and utilizing a counseling program early in a student's college career would create the opportunity for a student with Adult ADD symptoms to improve his or her academic and educational experience. The improvement in the student's academic performance then would lead to an increase in the opportunity to complete and obtain a degree at Old Dominion University. Ultimately, the university would see an increase in retention rates commensurate with the Strategic Plan.

## DEFINITION OF TERMS

Research in the field of Adult ADD is in an embryonic state according to Brown (2000). Preliminary findings suggest that ADHD inattention symptoms overlap with the executive functions in the brain. The executive functions connect, prioritize, and integrate operations of subordinate brain functions and manage ongoing mental activities. Because these functions are linked to attention, and not hyperactive or impulsive behavior, the term ADHD or hyperactivity may be misleading. Therefore, the term Attention Deficit Disorder (ADD) often is used to focus on the core symptoms of inattention, even when hyperactivity is included as a symptom. Beginning in junior high school and continuing

through the first two years of college (Brown, 2000), the demands on executive functioning continue to increase. It is during these years that students experience the greatest increase and broadest range of cognitive and social activities. Parents and teachers demand that they accept a greater role in managing responsibilities. Since the demands on executive functioning increase and become more complex as the individual gets older, the symptoms of ADD become more recognized in early adulthood rather than in childhood, especially when hyperactivity is not a symptom. These developmental impairments in executive functioning (Brown, 2000), which only become noticeable in the higher educational grades as the demands on executive functioning increase, have significant implications for the onset of ADD symptoms for determining ADD diagnostic criteria.

In a study that has implications for college students, Weyandt, Linterman, and Rice (1995) found that ADHD characteristics in college students might be more prevalent than previously identified. In their study, 2.5% of college students reported ADHD characteristics in childhood and adulthood, with 8% reporting adult ADHD characteristics in adulthood. These numbers are higher than expected, since few students with ADHD characteristics were thought to attend college.

According to the *Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM-IV)* (1994), to meet the diagnostic criteria for ADHD, the onset of symptoms must be identified by the age of seven. A problem in identifying and diagnosing adults with ADD symptoms is that the criteria used in the *DSM-IV* for ADHD were intended for all age groups, yet the research used to develop the criteria was based only on children from four to seven years old. This information has led some researchers to question the validity of the current age requirement used to diagnose ADD (Barkley,

Russell, & Biederman, 1997) and has led other clinicians and researchers to develop their own criteria to appropriately fit and, therefore, effectively diagnose and treat adults. The *DSM-IV-TR* (2000) criteria for AD/HD have not changed from the *DSM-IV*. But the criteria for the diagnosis of AD/HD Not Otherwise Specified have been changed to include those individuals who meet the criteria for AD/HD Predominantly Inattentive Type but whose age of onset of symptoms was after seven years of age.

The terms AD/HD, ADHD, and ADD often are used interchangeably by different authors to describe their research due to the changing terms and characteristics utilized by the current *Diagnostic Statistical Manual* at the time of their research. The terms also reflect the differences in the accepted clinical and educational terminology, but all refer to the same mental health disorder. The term Attention Deficit Disorder (ADD) will be used for adult characteristics identified in this study and research. This term is preferred due to the focus on inattention characteristics of adults in this study and the use of the Brown Attention-Deficit Disorder Scales, Ready Score-Adult, which measure these characteristics utilizing the term ADD.

In this research, the term European-American refers to and includes Caucasian and White individuals, students, and research subjects. The terms are used interchangeably for ethnicity depending, on the acceptability of the terms at the time of the study or research.

The Brown Attention-Deficit Disorder Scales, Ready Score-Adult is a 40 item self-report scale, which measures cognitive and affective impairments that are beyond the inattentive criteria for ADHD in the *DSM-IV*. The adult scale is used for individuals 18 years and older. The range indicates the level of symptomatic impairment that is associated with ADD. The range of scores is from 0 to 120, with a score of below 40 as “ADD

possible but not likely”, between 40 to 54 as “ADD probable but not certain”, and 55 and above as “ADD highly probable”.

The Old Dominion University Freshman Survey (Pickering, Calliotte, & McAuliffe, 1992) measures the non-cognitive predictors of academic difficulty for freshman students at the end of their first year and predicts attrition or retention into the second year of college academics. It also is designed to identify and subsequently treat freshman students who are at risk for academic difficulty (Calliotte, Pickering, & McAuliffe, 1994). A probation score is developed from the responses on the survey that are designed to predict those students that may experience academic difficulty, defined as having a grade point average (GPA) of less than 2.00 on a 4.00 point scale. The scores range from 1-45, with a higher score correlating to a greater likelihood of being placed on academic probation.

## RESEARCH QUESTIONS AND HYPOTHESES

Do college students who have been identified as higher risks for academic probation also have several indicators for Adult ADD? This question raises another question: are Adult ADD symptoms a significant academic problem for college students? This study will investigate whether or not Adult ADD symptoms are a significant problem for college students. This will be accomplished by comparing and correlating the Brown ADD Scales, Ready Score-Adult to another available testing tool, The Old Dominion University Freshman Survey, to determine the effect size (Cohen, Cohen, West, & Aiken, 2003). The Freshman Survey currently is utilized at Old Dominion University to understand the backgrounds, attitudes, and motivations of incoming freshman students, in order to provide support and assistance. It also provides a probation score that can be

used to predict academic success, since a higher the score indicates a greater probability of being placed on academic probation. Academic Probation is defined as having a GPA of less than 2.00 on a 4.00 scale (Pickering, Calliotte, & McAuliffe, 1992). It is beyond the intended scope of this study to diagnose individuals with Adult ADD or provide direct assistance in addressing Adult ADD symptoms.

The goal of this study is to investigate the relationship between college students' scores on the Old Dominion University Freshman Survey and Brown's measure of Adult Attention Deficit Disorder. This investigation will include a predictive study of the students' grade point average and whether or not the Brown's measure accounts for variance over and above the Old Dominion University Freshman Survey. This investigation also will explore whether or not there is an overrepresentation of minorities whose Brown's ADD Scale score indicates Adult ADD "highly probable".

Hypothesis 1: There is a relationship between college students' score on Brown's ADD Scales measuring Adult ADD and the students' probation score on the Old Dominion University Freshman Survey.

Null Hypothesis: There is no relationship between college students' score on the Brown's ADD Scales measuring Adult ADD and the students' probation score on the Old Dominion University Freshman Survey.

Hypothesis 2: There will be a relationship between college students' score on the Brown's ADD Scales measuring Adult ADD and the college students' grade point averages.

Null Hypothesis: There will not be a relationship between college students' score on the Brown's ADD Scales measuring Adult ADD and the college students' grade point average.

Hypothesis 3: While controlling for the students' probationary scores on the Old Dominion University Freshman Survey, the college students' score on the Brown's ADD Scales will account for statistically significant amount of variance in college students' grade point average.

Null Hypothesis: While controlling for the students' probationary scores on the Old Dominion University Freshman Survey, the college students' score on the Brown's ADD Scales will not account for a statistically significant amount of variance in college students' grade point average.

Hypothesis 4: There will be an overrepresentation of minority college students, as compared to European-American college students, who score higher on the Brown's ADD Scale measuring Adult ADD.

Null Hypothesis: There will not be an overrepresentation of minority college students, as compared to European-American college students, who score higher on the Brown's ADD Scale measuring Adult ADD.

## LIMITATIONS

The *DSM-IV-TR* (2000) states that the essential feature of AD/HD is a persistent pattern of inattention that is more frequent and severe than is typically observed in individuals at the same stage of development. It also states that some of the inattentive symptoms that cause the current impairment must have been present before the age of seven years. This stipulation makes the diagnosing of ADD difficult but has less impact if

ADD symptoms are only being identified, as is the case in this study. It is also important to remember that in order to describe ADD, a polythetic definition (Wender, 1995) is used to meet the criteria, meaning that only six out of nine symptoms must be present (*DSM-IV-TR*). This means that individuals with the same disorder may not have the same symptoms. This may explain the broad range from 1 - 22% of the general population that professionals feel may have ADD symptoms. One way to conceptualize ADD is to view it as a continuum of symptoms. At one extreme are individuals with no ADD symptoms, while at the other extreme are individuals with all the ADD symptoms. Those individuals in the middle have half non-ADD symptoms and half ADD symptoms. There is no single point that defines a person as either non-ADD or ADD, but rather a range on a continuum. An individual may be inattentive, hyperactive, or distractible from time to time, but for the individual with ADD symptoms, the characteristics occur more often and lead to problems. The severity of the problems or whether or not problems arise depends on the environment in which the symptoms occur (Weiss, 1992). This is supported by the *DSM-IV-TR*, which states there must be some impairment from ADHD symptoms in two or more settings, such as at school, home, or work, in order to meet the criteria for ADHD. If an individual is not in a school setting or an environment of rigid requirements and constraints, ADHD symptoms may not be evident or problematic. An individual has choices in a home or a work environment and, therefore, more flexibility in utilizing coping mechanisms. But once confronted with the structured academic environment of a school or college, individuals may find that coping mechanisms are limited, and ADHD symptoms may become more apparent and significant.

The Brown ADD Scales are neither designed nor intended for making or ruling out a diagnosis of ADD. For a diagnosis, a comprehensive evaluation is required, along with additional testing tools such as the Brown ADD Diagnostic Form. The Brown ADD Scales Ready Form is only intended: as an initial screening tool, for comprehensive diagnostic assessment as only one tool in a battery of assessment instruments, and as a tool for monitoring ADD treatment responses (Brown, 2000). Emphasis must be placed on the insufficiency of using a single test or scale to diagnose an individual for ADD. Many issues involved in the evaluation of ADD are beyond the scope of rating scales that focus on current symptoms and behaviors. Issues such as chronic impairments and co-occurring conditions need to be considered and assessed, while medical conditions, psychiatric disorders, and stressful events need to be ruled out. Self-reporting scales represent only one tool in the evaluation process (Erhardt, Epstein, Conners, Parker, & Sitarenios, 1999). The scales represent a degree of ADD symptoms and warrant further evaluation if the symptoms create significant problems in an individual's academic, social, or work environment. The scales do not reflect a problem in the student but may reflect a source of some of a student's inability to cope with everyday situations that require attention or concentration (Wender, 1995).

## SUMMARY

The impact of counseling on academic progress and retention of college students is demonstrated in a six-year study by Turner and Berry (2000), which found that students who received counseling through the college counseling center had better retention rates than the entire student body. The rates achieved by the students that had counseling were



achieved in spite of significant personal problems that impacted and interfered with their academic progress.

In response to colleges' and universities' concerns that 40% of matriculating freshman do not reach their junior year (Schwitzer, Grogan, Kaddoura, & Ochoa, 1993), university counseling centers are being asked to address the issue of retention and attrition. One intervention that is utilized is mandatory counseling for academically at risk college students. Schwitzer, Grogan, Kaddoura, and Ochoa (1993) identified sophomore college students whose freshman GPA was below 2.3 on a 4.0 scale and placed them in a mandatory-counseling program. They found that the GPA for these students rose from 2.0 to 2.3, though one-third of the students still left college prior to graduation. Students who returned voluntarily for counseling on a limited basis had the highest improvement in academic performance, while the students who made the greatest use of counseling services made the lowest academic gains but were more likely to remain enrolled and graduate.

Unfortunately, there is extremely limited information on studies that systematically have investigated strategies and techniques for helping college students with ADD, though there have been individual case studies. Therefore, it is unknown which factors are related to academic success for students with ADD symptoms or how co-occurring learning disabilities or psychiatric disorders impact college performance. With the possibility that only 5% of students with ADD complete college, it is important to identify ADD symptoms prior to or during the first month of classes. Beginning freshmen often are shocked when they realize that college is different from high school and that it requires greater self-discipline and self-control. But evidence shows that college students with

ADD symptoms can be successful when identified prior to starting college or very early in the first semester of classes and when they have a developed set of study strategies while working closely with faculty and academic advisors (Teeter, 1998).

Symptoms of ADD significantly compromise academic performance for college students, as well as impacting many aspects of their social lives. If treatment techniques are to be developed for academic at risk students, then specific strategies need to be implemented in collaboration with the student, the teacher, and the academic advisor (Brown, 2000). But before appropriate treatment can begin, the need for better identification of ADD symptoms and treatment has to be resolved. The Brown ADD Scales-Adult and the Old Dominion University Freshman Survey can be used for identifying any relationship that exists between Adult ADD symptoms and academic difficulty, demonstrating the need to identify ADD symptoms in order to provide services that address both clinical and academic issues.

## CHAPTER II

### REVIEW OF THE LITERATURE

#### ADULT ADD SYMPTOMS

Though the diagnostic criteria for inappropriate inattentiveness, hyperactivity, and impulsive behavior has been revised over the years, the field studies for the *DSM-IV* only utilized children and adolescents between 4-16 years and did not include adults. As children were the exclusive source in the field studies, the content validity for the *DSM-IV* items has not been established due to inadequate sampling of the manifestations of core symptoms that pertain to adults with this disorder. In addition, the diagnostic thresholds for each core symptom may not apply to those age groups outside of the range used in the field studies (Conners et al., 1999). Therefore, the application of these symptoms in diagnosing adults with ADHD may be in question. Continuing revisions of the ADHD criteria are further complicated, as the *DSM-IV* criteria was developed by a subcommittee that was given the task of examining disruptive disorders usually found in childhood. The resulting criteria found in the *DSM-IV* were the consequences of the discussions and compromises during the review of literature of that working group. Therefore, clinicians should not be bound by the *DSM-IV* criteria (Resnick, 2000). The failure to use an adult population has resulted in the failure to identify criteria for adults with ADHD symptoms that were not identified during their child and adolescent school years.

The failure to identify adult characteristics results in three major problems in accurately diagnosing ADD in adults. The first problem in meeting the criteria in the *DSM-IV-TR* is that the hyperactivity-impulsive or inattentive symptoms that cause impairment must be present before the age of seven. Attaining a childhood history from the individual

is difficult due to inaccurate memories of childhood events and changes in mood and behavior. Recollections by the individual of potential ADD symptoms of over-activity, impulsiveness, and inattention are often inaccurate. The history provided is more reliable if another person, such as a parent, corroborates the information. If a parent is not available then a spouse, friend, or relative could be a satisfactory source of information. Follow-back or retrospective studies have shown that as much as one-fifth of adult patients could not recall that they were hyperactive as children and that parent information provided a more valid measure of the childhood disorder (Attention Deficit, 1994). However, problems of historical accuracy are difficult to resolve if it is the parent, sibling, or friend of the individual providing the information. Often, clinical symptoms, which may be indications of hyperactive or inattentive symptoms, are instead described as behavioral or disciplinary problems (Brown, 2000).

The second diagnostic problem is the high rate of co-occurring or comorbidity of other psychiatric disorders that can be found with ADD in every age group. The majority of children with ADHD have oppositional disorders, conduct disorders, or learning disabilities. Adolescents and adults who were diagnosed as children with ADHD are likely to have current antisocial personalities, substance abuse disorders, and educational or occupational problems (Attention Deficit, 1994). It is not only that comorbidity does occur but the high incidence is a treatment concern. Comparisons of those with ADD and those without ADD have shown much higher incidence rates for a wide variety of a second psychiatric disorder for those with ADD. For example, anxiety disorder is generally reported in about 5% of the population, while it is found in 25% of the ADD population. Other studies have reported that among adults with ADD, 77% meet the

criteria for at least one comorbid psychiatric disorder (Brown, 2000). It is estimated that learning disabilities, depending on the definition used, can be found in 10-90% of those individuals diagnosed with ADD (Resnick, 2000).

The third diagnostic problem is the overlap of symptoms of mood, psychosis, and borderline personality disorders. The *DSM* system is not designed to rule out other symptoms and disorders and can lead to confounded diagnoses (Attention Deficit, 1994). The conditions that have similar symptoms include anxiety disorder, bipolar disorder, caffeinism, conduct disorder, depression, impulse control disorder, chronic fatigue, fetal alcohol syndrome, hyperthyroidism, hypothyroidism, lead poisoning, learning disabilities, obsessive compulsive disorder, oppositional disorder, pathological gambling, personality disorders, pheochromocytoma, post traumatic stress disorder, seizure disorder, situational adjustment disorders, substance abuse, and Tourette's syndrome (Hallowell & Rately, 1994).

To further complicate the diagnosis of ADD, some researchers believe there are sub types of ADD that are not acknowledged by the *DSM* process. They feel that, by focusing on only the core symptoms, an overall understanding of this complex syndrome is often missed. Hallowell and Rately (1994) describe 13 sub-types, as seen in adults, based on their clinical experience. These sub types include ADD without hyperactivity, ADD with anxiety, ADD with depression, ADD with other learning disorders, ADD with agitation or mania, ADD with substance abuse, ADD in the creative person, ADD with high risk behavior or "high-stim" ADD, ADD with dissociative states, ADD with borderline personality features, ADD with conduct disorder or oppositional disorder or

antisocial personality features, ADD with obsessive-compulsive disorder, and Pseudo-ADD.

Another example of sub-types is the categories developed by Amen (2001) through brain images and fieldwork. His six types give insight into the subtle complexities of ADD in order to provide effective treatment to those who may otherwise have been ignored. Type 1, or Classic ADD, includes symptoms of being inattentive, distractible, disorganized, hyperactive, restless, or impulsive. Type 2, or Inattentive ADD, includes symptoms of being inattentive, sluggish, slow moving, or having low motivation. Type 3, or Overfocused ADD, includes symptoms of trouble shifting attention, getting stuck in loops of negative thoughts, worrying excessively, or being obsessive, inflexible, oppositional, or argumentative. Type 4, or Temporal Lobe ADD, includes symptoms of having dark thoughts or mood instability and being severely impulsive or inattentive. Type 5, or Limbic ADD, includes symptoms of being inattentive and having chronic low-grade depression, negative feelings, low energy, or feelings of hopelessness and worthlessness. Type 6, or Ring of Fire ADD, includes symptoms of being inattentive, distractible, angry, irritable, overly sensitive to the environment, hypervocal, or oppositional or having cycles of moodiness.

Hartmann (1995), in discussing the non-clinical symptoms of a 'brain disease', described them as the Hunter/Farmer model. In this model, the hunters carry the core components of ADD, which include distractibility, impulsivity, risk-taking, and restlessness. Farmers do not carry these core components. To the primitive hunter, these were advantages. Distractibility was useful in scanning and looking for food. Impulsivity provided the hunter with the advantage to make quick decisions or the willingness to

explore new areas. Risk-taking and restlessness were advantages in allowing the hunter to go out into the wild and unknown and risk danger in search of food for survival. For the farmers, however, these core components were liabilities. In contrast, a farmer could not be distracted and wander off every time he saw something new or unusual, especially when the soil was ready for planting or the crops were ready for harvesting. Impulsivity was a liability to the farmer who had to wait until his crops grew and were ready for harvest. Risk-taking and restlessness were liabilities for the farmer who must decide between planting the same crop as the previous year (which grew so well) and planting a crop that he had no experience in growing. Whether the Hunter/Farmer model is or is not viewed as a good scientific explanation is not vital. What is vital is that ADD is reframed so as to understand the complexities of ADD symptoms in order to provide improved techniques for working with individuals that have problems that are attributed to these symptoms. It is important to understand that a specific behavior or symptom in one environment may be seen as advantageous and the same behavior or symptom seen as a liability in another environment. It is equally important to be aware that individuals can learn to modify their behavior to adapt to that particular environment. Then, when ADD is viewed either through clinical symptoms or behavioral terms, this awareness creates a wide variety of techniques that can be utilized to minimize the problems ADD symptoms cause in school, at work, at home, or in relationships.

In addition to these three difficulties in diagnosing Adult ADD, there is the additional problem in the often-misleading definition of 'diagnosis' itself. There are two approaches in diagnosing that can be misleading. The first is categorical. This approach in diagnosing is based on certain specific symptoms. These symptoms have varied in

requirement to meet diagnostic criteria from 8 of 16 in *DSM-III*, to 8 of 14 in *DSM-III-R*, to (currently) 12 of 18 in *DSM-IV-TR*. If the number of symptoms meet the minimum required, then the patient can be diagnosed with the disorder. If the patient is one symptom short, then a diagnosis cannot be made for the disorder. The second approach for diagnosing is dimensional. This is based on the use of questionnaires and rating scales given to the patient, family members, and/or teachers. A predetermined cutoff score is used to diagnose those with or without the disorder, depending on if their scores fall above or below this value. These symptoms are based on the patient's self report and the observations of the evaluator, and they are not based on biochemical, anatomical or tissue pathology as are other diseases or disorders. There are no etiological diagnoses for mental health disorders and especially not for Adult ADD. Therefore, the symptoms and interpretations are often left open to discussion due to the sensitivity and specificity in diagnostic techniques and the inability to validate against an independent criterion as in other medical areas. This ambiguity creates great difficulty for accurately diagnosing the disorder (Wender, 1995). It is especially important to be aware and have a knowledge of the long term effects of AD/HD since the disorder may represent the number one reason for referral to outpatient treatment centers (Sagvolden & Archer, 1989).

The following sections discuss these problems and concerns through a review of studies and their implications that address the credibility of Adult ADD characteristics and diagnosis and the relationship of Adult ADD to social issues.

#### AGE CRITERIA

It is essential to remember that the diagnosis of Adult ADD is based on information and symptoms of the individual at or near the age of seven in two or more



settings such as school, home, and work. Therefore, if a diagnosis is to be made or research is to be conducted on an adult, the childhood clinical history is mandatory. For the purpose of conducting research for Adult ADD there are two broad types of studies, prospective and retrospective, which depend on when the symptoms were diagnosed, according to Klein and Mannuzza (Sagvolden & Archer, 1989). A study can be called prospective if the diagnosis of AD/HD is made in childhood. It is retrospective if the individual is diagnosed after the fact or during adulthood. There are two types of retrospective studies. One type examines old charts of children that were seen in psychiatric or guidance clinics and diagnosed retrospectively. Another type of retrospective, or 'follow-back' study, first identifies a deviant population, such as substance abusers or psychiatric outpatients, and then diagnoses an individual with childhood AD/HD symptoms with the information provided by the patient (Weiss & Hechtman, 1993). Some researchers refer to this second type as a 'cross-sectional' study. The 'follow-back' study designation is then used for those studies where the individuals are retrospectively diagnosed and then examined for their current psychiatric status. Though the terms may be used inconsistently, it is the intent of the researchers to demonstrate that 30-60% of childhood AD/HD symptoms may persist into adulthood, affecting 2-6% of the entire adult population (Wender, 1995).

Though there have been numerous studies of AD/HD children, there have been only two prospective studies that followed AD/HD children into adulthood. In 1962 Weiss and Hechtman (1993) and their colleagues studied 104 children, ages 6 to 12 years old, who had been taking part in a series of drug tests. These children were suffering from pervasive restlessness and poor concentration at home and at school. Though none were

diagnosed with the *DSM-III*, retrospectively, they all had ADD(H), with the majority also having conduct problems. At the ten-year follow-up, 76 individuals from this group were interviewed. The mean age of this group was 19 years old. They were matched with and compared to 45 volunteer subjects. When the group with hyperactive characteristics was compared to the control group, the group with hyperactive characteristics was seen to have more impulsive personality traits, accidents, and geographic moves. The group with hyperactive characteristics also achieved a significantly lower level of education and left school earlier due to low marks and expulsion. The group with hyperactive characteristics rated themselves lower on a personality inventory designed to measure self-esteem and social integration and also as more pathological on the brief psychiatric rating scale. The researchers felt the mean age of 19 years old was too young for either the hyperactive or control groups to reach the maximum age for the psychiatric disorders to develop; therefore, a 15-year follow-up interview was completed on 61 of the original children with hyperactive characteristics and 41 of the 10-year control group. The results illustrated that, of the group with hyperactive characteristics, 66% versus 7% of the control group continued to have at least one disabling symptom of the hyperactive child syndrome using the *DSM-III-R*. There was no evidence that hyperactivity in childhood predisposes one to psychosis in adulthood, with only two in the hyperactive group and one in the control group being diagnosed with schizophrenia. Twenty-two individuals in the group with hyperactive characteristics versus two in the control group were diagnosed with more than one mental health disorder, antisocial personality disorder being the most common. There also was no evidence of children with hyperactive characteristics abusing alcohol more than the control group. They concluded from these studies that hyperactive characteristics

syndrome is a pervasive condition in childhood, affecting behavior, social functioning, learning, and self-esteem. Though half seem to outgrow the characteristics, the other half continue to have disabling characteristics, which predisposes them to various types of maladjustment in adulthood.

The second study, which was conducted by Mannuzza, Klien, Bessler, Malloy, and LaPadula (1998), began in 1970 and ended in 1975 and consisted of 103 Caucasian boys between the ages of 6 and 12 years old. Teachers had referred the boys to a no-cost research psychiatric clinic for treatment for behavioral problems. The boys all had been diagnosed using the *DSM-II*; at the time, the disorder was called hyperkinetic reaction of childhood, but it is currently referred to as hyperactivity. During their late adolescent follow-up interview, which was conducted between 1979-1982, information was obtained on 98% of the original cohort. This group had a mean age of 18 years old. They were compared to a control group of 100 Caucasian males who were matched by age and social status and had been referred to a medical clinic. Attention deficit disorder symptoms were found in 40% of the original cohort but only 3% in of the control group. In addition, 27% of the cohort verses 8% of the control group showed antisocial personality disorder, while 16% of the cohort verses 3% of the control group was identified with drug abuse symptoms. These same cohort members (88%) were again interviewed during an adult follow-up. The group had a mean age of 25 years old. Clinical impairing ADD symptoms were identified in 11% of the original cohort verses 1% of the same control group. Antisocial personality disorder symptoms were also identified in 18% of the cohort verses 2% of the control group, with 16% vs. 4% being identified with substance abuse disorders. A second cohort of 104 Caucasian boys, whose 16<sup>th</sup> birthday would be in the

1984-1987 time frame, were identified with the same characteristics as the original cohort and were also matched with a control group. At their late adolescent follow-up interview, information was obtained from 90% of the childhood cohort. This group had a mean age of 18 years old. Of this cohort, 43% versus 4% of the control group were identified with ongoing ADD. In this study, 32% of the original cohort versus 8% of the control group were diagnosed with antisocial personality disorder, with 10% of the original cohort versus 1% of the control group identified with drug abuse disorders. Using the *DSM-III-R* for their adult follow-up interview, 85 (82%) of the original cohort and 73 (94%) of the control group members were interviewed. These cohorts had a mean age of 24 years old. Of the original cohort, 4% versus 0% of the control group were identified with ADHD, while 12% versus 3% were diagnosed for antisocial personality disorder, and 19% versus 10% were diagnosed with substance abuse disorders.

Concerns about the designs of these studies have arisen. First, the subjects were chosen before the *DSM-III* was developed, so an accurate and consistent diagnosis is questionable (Wender, 1995; Morgan, Hynd, Riccio, & Hall, 1996). Another concern was that, in the Mannuzza and Klein studies, subjects had been referred to the clinic for behavioral problems. These subjects might now be diagnosed with primary or comorbid oppositional defiant disorders, conduct disorders, or learning disabilities. Not identifying an additional diagnosis at the initial interview but identifying one on a subsequent interview or any change in the criteria to be met for AD/HD might have an impact on diagnosing continuing AD/HD symptoms. In addition, due to the fact that the diagnosis is based on a minimum number of symptoms, it is undetermined how many symptoms were used to diagnose the subjects at the initial interview. It is also uncertain if individuals

diagnosed with AD/HD would have met the same criteria with the *DSM-III-R* used at the follow-up interviews or even the current *DSM-IV-TR*. If subjects had been identified with eight symptoms using the *DSM-III-R* and, five years later, only identified with seven, that would mean they were no longer diagnostically hyperactive and would not be diagnosed with the AD/HD disorder, yet the symptoms may still remain. In both studies, girls were not significantly represented, with the Mannuzza and Klein study using 100% boys and the Weiss and Hechtman study using 90% boys (Wender, 1995).

In a prospective follow-up of the second study (Mannuzza et al., 1998), Mannuzza, Klein, Bessler, Malloy, and Hynes found that the 73 adults from the control group had completed two more years of schooling, compared to the 85 adults from the ADHD group. Of the ADHD group, 25% did not graduate from high school, compared to 1% of the control group, with only 15% of the group with ADHD characteristics completing college, compared to over 50% of the control group. In addition, of the group with ADHD characteristics, only 3% were enrolled in or had completed a graduate program, compared to 16% of the control group. The study demonstrates that childhood ADHD could have a continuing effect on adolescents and adults, possibly predisposing them to academic difficulties.

A retrospective study by Biederman, Faraone, Knee, and Munir (1990) addressed family patterns of ADD, as well as substantiated ADD, as an adult disorder. At the time of the study, the diagnosis of Adult ADD remained controversial. Using standardized interview techniques and blind assessment, 24 relatives that had not been referred for psychiatric problems of children that had been referred and diagnosed with AD/HD were compared to 51 relatives of children that had not been referred and were not diagnosed

with AD/HD symptoms. Of the relatives of children that had AD/HD symptoms, 71% had symptoms that would have met the ADD criteria in clinically referred children, and 6% of the relatives of non-referred non AD/HD children also met the same criteria.

Mannuzza, Klein, Klein, Bessler, and ShROUT (2002) studied the issue of retrospective diagnoses of childhood ADHD that are required for the *DSM-IV* to diagnose current ADHD. In a prospective 16-year follow up of 207 boys diagnosed with ADHD, 176 of the subjects, with a mean age of 25 years, were compared to a group of 168 subjects that were not diagnosed with ADHD. Clinicians who did not know the subjects' current or past diagnoses were asked to interview the subjects and diagnose them retrospectively for ADHD. Of the 176 adults previously diagnosed with ADHD, 78% were accurately retrospectively diagnosed, and of the 168 adults without ADHD, 11% were inaccurately retrospectively diagnosed with ADHD. This study demonstrates the importance of not only relying on historical information to make reliable diagnoses but also using current symptoms to diagnose ADHD.

In a study that addressed the choice of seven years as the age-of-onset criteria for ADHD, Applegate et al. (1997) examined 380 ADHD individuals who were between the ages of 4 and 17 years and compared them for onset of impairment symptoms. Of those individuals meeting criteria for the predominantly hyperactive-impulsive subtype, nearly all met the age-of-onset criteria of seven years, but for those meeting the criteria for the predominately inattentive subtype or ADD, 43% did not meet the age-of-onset criteria. This does not support the validity of the age-of-onset criteria for the *DSM-IV* but does support the validity of differences between the subtypes of ADHD. Barkley and Biederman (1997) support the conclusions of Applegate et al. (1997). The requirement of

the age-of-onset criteria limits the accurate diagnosing of adults with current ADD impairments that cannot recall or provide documentation of symptoms to fulfill the age-of-onset criteria.

To validate the adult diagnosis of ADD, Biederman, Faraone, Spencer, et al. (1993) wanted to make sure that the syndrome in adults was the same syndrome that was being observed in children, using the same characteristics in the *DSM-III-R*. A group of 84 adults that had been referred for treatment of AD/HD symptoms were diagnosed with childhood onset of AD/HD. They were then compared to 140 children already diagnosed with AD/HD, to a group of 43 of these children's non-referred adult relatives with AD/HD, and to 248 non-AD/HD adult relatives of non-AD/HD children. After utilizing a standardized assessment battery, the researchers found the referred and non-referred adults with AD/HD were similar to one another but were more impaired than the adults without AD/HD symptoms. The two adult AD/HD groups did not differ significantly in rates of other psychiatric disorders, but when compared to the non-AD/HD adult group, they had higher rates of antisocial personality disorders, conduct disorders, oppositional defiant disorders, substance abuses, anxiety disorders, enuresis, stuttering, and speech and language disorders. Also, the AD/HD adult groups, as compared to the non-AD/HD adult group, had experienced higher rates of repeated grades, tutoring, special education classes, and reading disabilities. The consistency of psychopathology, cognition, and functioning of the AD/HD adults compared to the AD/HD children supported the validity of the diagnosis of AD/HD disorder for adults.

Though there has been continuing research in AD/HD, there remains disagreement among researchers and clinicians as to whether any symptoms of childhood AD/HD

continue into adulthood. Various behavior rating scales have been used to assess childhood AD/HD, but since the study of adults with continuing childhood AD/HD symptoms is a relatively new area, there remains a need to explore neuropsychological and personality factors in Adult ADD. Doeney, Stelson, Pomerleau, and Giordani (1997) used established tests with age corrected norms to compare a battery of psychological and neuropsychological tests given to an adult ADHD population at the University of Michigan's Behavioral Medicine Program outpatient clinic. The subjects were patients who were either self-referred or referred by therapists, doctors, or teachers. They completed checklists to determine *DSM-III-R* adult and childhood ADHD symptoms. A worksheet was also given to their parents in order to assess family background, the subjects' childhood medical, academic, and behavioral history, and the onset of their symptoms or problems. Of the 78 patients selected, 78% were male and were all Caucasian. The mean age was 33.24 years old and the mean education level was 13.97, with the mean estimated IQ being 109. The subjects were given the Test of Variables of Attention (TOVA), the Attention Capacity Test (ACT), the California Verbal Learning Test (CVLT), the Finger Tapping Speed Test, the Short Category Test, the Stroop Color and Word Test, the Shipley Institute of Living Scale, the MMPI-2, the Beck Depression Inventory, and the Tridimensional Personality Questionnaire. The results of the tests showed there was a high degree of comorbidity between adult ADHD and other psychiatric disorders, with 47% of the subjects being diagnosed with an axis I disorder of anxiety or depression. The subjects were then compared to normative data from the catchments area, with 37% diagnosed with a depressive disorder (mean 6.1 to 9.5%), 33.3% with histories of alcohol abuse/dependence (mean 11.5 to 15.7%), 20.5% with histories of drug



abuse/dependence (mean 5.5 to 5.8%), and 12.8 with antisocial personality disorder (mean 2.1 to 3.3%). The ACT and the CVLT scores indicate difficulties with processing auditory material, and the TOVA scores reflected problems sustaining attention over relatively long training sessions. Taken together these tests showed that deficits may reflect problems in certain academic tests such as learning course material through listening to long lectures and sustaining attention in order to take notes. This study substantiates the theory that not only do childhood ADHD symptoms continue into adulthood but co-occurring disorders and disabilities complicated identification and treatment of Adult ADHD.

An additional problem of identifying and meeting the criteria of Adult ADD with the child and adolescent criteria provided in the *DSM-IV-TR* is that, although follow-up studies have shown childhood ADHD symptoms persist into adulthood, the number and strength of the symptoms is not defined and often inconsistent. To examine the different patterns of remission of childhood symptoms into adulthood, Biederman, Mick, and Faraone (2000) compared 140 ADHD and 120 non-ADHD Caucasian boys at five different points from onset through a four year follow-up assessment. The 14 *DSM-III-R* ADHD symptoms were grouped into three categories: inattentive, which had six symptoms; hyperactive, which had four symptoms; and impulsive, which had four symptoms. Three different definitions of remission were used and measured: syndromatic, as failing to meet the full diagnostic criteria with seven or less symptoms; symptomatic, as having fewer than required for a sub-threshold diagnosis with four or fewer symptoms; and functional, as having four or less symptoms and no impairment. The study showed that at 18-20 years of age there was a significant remission of syndromatic symptoms, with a moderate remission of symptomatic symptoms and only minimal remission of functional

symptoms. It also showed that the greatest remission of ADHD symptoms were for hyperactivity and impulsivity, with inattention symptoms remaining for the majority of the ADHD subjects.

Hill and Schoener (1996) analyzed data from prior research to determine whether the diagnosis of ADHD was retained from childhood into adulthood and at what ages did the symptoms diminish. Having reviewed numerous studies with different research designs and methodology, they found that at approximately every five years in age of children starting at the age of nine years, the rate of ADHD in a given age group declines by 50%. They determined that children at age nine years were the baseline for the inception of ADHD symptoms; therefore, this age group equaled 100% for ADHD symptoms. Stating that the given prevalence of ADHD in childhood was 4%, then by the age of 20, the rate would be 0.8% declining to 0.05% by the age of 40. At the time of this research, there was limited information concerning adult ADHD symptoms above the age of 20 and only one set of data available at 25.5 years of age. This study also does not reflect if the decline in ADHD symptoms over time is due to pathology or the individual adapting to the symptoms. The study did reflect, however, that ADHD symptoms do extend into adulthood and that the symptoms decline with time.

Though there has been an abundance of ADHD research involving children and adolescents, there has been very limited research involving adults and even less focusing on the cognitive functioning of adults with ADD. Walker, Shores, Trollor, Lee, and Sachdev (2000) found that with the limited research of adult ADD there were numerous inconsistencies that included incomplete diagnosing criteria and co-occurring psychiatric disorders that may account for the failure of existing research to establish ADHD as a

neurocognitive disorder. Their study was designed to demonstrate that adults with ADD, as compared to healthy adults, would show impairments of their executive functioning including response inhibition, interference control, response speed, variability, working memory, verbal fluency, speed of processing information, and arithmetical skills. They used 30 individuals in each of three groups: ADD, psychiatric, and healthy. The group with ADD had no co-occurring disorders. The psychiatric group included 15 individuals with mood disorders, 10 with anxiety disorders, and 5 with mixed mood and anxiety disorders. They were given the National Adult Reading Test, the Conners Continuous Performance Test, the Wechsler Adult Intelligence Scale, and the Digit Symbol Stroop Test. The results showed that the ADD group demonstrated attention dysfunction and slowed information processing greater than either the healthy group or the psychiatric group. They concluded that inattention was a key symptom in adult ADD, while response disinhibition was the more prominent feature in children with ADD. This finding may reflect the influence of maturation process with children displaying impulsivity, while adults are able to inhibit their behavior in structured settings. These findings suggest that inattention and slowed information processing (Walker, Shores, Trollor, Lee, & Sachdev, 2000) may be the primary neurological impairments in adults with ADD.

In a study to determine if adults with ADD had deficits in their executive control, Murphy (2002) compared 18 adults with ADD to a control group of 18 subjects using two tests of executive control and two control tests. The first executive control test was the Tower of Hanoi, which is a test of problem solving ability. The second executive control test was the Trail Making Test (A), which is a test of speed of visual search. The two control tests that were not a measure of executive control, the Trail Making Test (B) and

the Benton Facial Recognition Test, were used to determine if the deficits were generalized or confined to the executive control domain. The scores showed that adult ADD subjects did have cognitive deficits as compared to the non-ADD adult subjects due to poorer results on both of the executive control tasks as well as on one of the control tasks. On the Tower of Hanoi Test the group with ADD solved the puzzle fewer times, was less efficient in solving the problem, and took a greater number of moves to solve the puzzle. The group with ADD also took longer to complete the Trail Making Test (B), as well as the Trail Making Test (A), which indicates a possible problem in the ability to focus. There was no difference between the groups for the Benton Facial Recognition Test. These test results suggest that adults with ADD carry these same problems into their everyday life, which causes an inability to complete tasks and to complete them efficiently.

#### COMORBID DISORDERS AND OVERLAPPING SYMPTOMS

One of the unique properties of ADD is that the disorder often co-occurs with other disorders, and the overlapping symptoms may confuse or complicate the diagnosis and possibly the treatment. The medical terminology for co-occurring is comorbid. These comorbid disorders are found in individuals with ADD at a greater rate than occurs in the general population (Brown, 2000). The comorbid disorders often do not interact with each other and need to be treated as separate and individually unique disorders. A problem in the diagnosing of the disorders has to do with whether a specific symptom relates to the ADD disorder or it is a symptom of a comorbid disorder. For example, if an individual experiences poor sleep, is this a symptom of ADD, depression, or mania? It is also possible that the individual may have two of the disorders, and the symptom occurs in both the disorders (Pliska, Carlson, & Swanson, 1999). The correct diagnosis of a

disorder and any comorbid disorder has a tremendous impact on the appropriate and successful treatment of each disorder. An additional possibility and concern is that subgroups of individuals with ADD and specific comorbid disorders may respond differently to treatment.

Biederman, Newcorn, and Sprich (1991) reviewed available literature on the extent and the importance of ADHD and comorbid disorders. The search reviewed the information gathered on hyperactivity, hyperkinesis, attention deficit disorder and attention deficit hyperactivity disorder as referenced with antisocial disorder, conduct disorder, depression, depressive disorder, bipolar disorder, anxiety disorder, mood disorder, learning disabilities, substance abuse, mental retardation, and Tourette's syndrome. The review found that ADHD with conduct, mood, and anxiety disorders, as well as learning disabilities, occur in childhood, adolescence, and adulthood more often than randomly. The reported range for ADD and comorbidity is 30-50% for conduct/oppositional disorders, 15-75% for mood disorders, approximately 25% for anxiety disorder, and 10-92% for learning disabilities. The review also found that ADHD combined with a comorbid disorder presents greater or different risk factors impacting clinical and pharmacological treatment.

These issues were explored in a study by Jensen, Shervette, Xenakis, and Richters (1993). Forty-seven children diagnosed with ADHD were compared to another group of 47 children, matched by age, sex, and social economic status, from a community that had received no mental health diagnoses. A third group of 47 children from a child psychiatry clinic who had mental health diagnoses but were without ADHD was used as an additional comparison group. These groups were used to examine the validity of the ADHD

diagnosis utilizing the Child Depression Inventory, the Revised Children's Manifest Anxiety Scale, the child Behavior Checklist, the Hopkins Symptom Checklist, the Life Events Record, and the *DSM-III*. The results showed that children with ADHD and children from the psychiatric clinic reported more symptoms of depression and anxiety than those children in the community. The children with ADHD symptoms also reported more externalizing symptoms, as compared to the children from the clinic. Those children with ADHD and a comorbid disorder of anxiety or depression had greater levels of life stresses and parental symptoms than those children only diagnosed with ADHD. This study demonstrates that there may be different subtypes of ADHD, possibly caused by different events and stresses, which could result in a need for different treatment methods for each subtype, each with different outcomes or results.

In a study to identify genetic factors on the transmittal of ADHD characteristics, Biederman et al. (1992) found that family-genetic influences continued to create a statistically and clinically higher risk for ADHD when environmental influences were factored out. In a study of 140 individuals with ADHD, 120 control subjects, and 822 first-degree relative of the subjects, 16% of the relatives of subjects with ADHD were found to have enough symptoms to be identified with ADHD, as compared to 3% of the relatives of the non-ADHD subjects. The relatives with ADHD characteristics also were found to have higher comorbidity of major depression, conduct disorder, drug dependence, and anxiety disorders. The study demonstrates the external validity of ADHD through the identification of ADHD in relatives of individuals diagnosed with ADHD, yet without using any family-genetic criteria. The family-genetic influence studied by Faraone et al. (1999) suggests a relationship between ADHD and specific DNA markers. A study

by Burt, Krueger, McGue, and Iacono (2001) found that, though genetic factors did contribute in the covariation among ADHD, oppositional defiant disorder, and conduct disorder, a single shared environmental factor was the most significant factor and accounted for the most covariation among the disorders.

To address the skepticism of the adult diagnosis of ADHD, Milberger, Biederman, Faraone, Murphy, and Tsuang (1995) designed a study to investigate three hypotheses. The first hypothesis was that the individual with ADHD plus a comorbid diagnosis has only the comorbid disorder, but because of overlapping symptoms, is misdiagnosed as having only ADHD. The second hypothesis was that the individual with ADHD plus a comorbid disorder has only ADHD, but because of overlapping symptoms is misdiagnosed with the comorbid disorder. The third hypothesis was that the individual with ADHD plus a comorbid diagnosis has both ADHD and a comorbid disorder. The extent of overlapping symptoms was assessed in three different groups: referred children and adolescents, non-referred parents, and referred adults with ADHD. Two methods were used to assess the overlapping symptoms. One method subtracted the overlapping symptom from both disorders. In the second method, after the symptom was subtracted, the remaining set of symptoms had to be as large as the proportion of the original set of symptoms. The results found that, of the 46 adults referred with ADHD and major depression using the subtraction method, 72% maintained the diagnosis of ADHD and 93% maintained the diagnosis of major depression. The same group, using the proportion method, 83% maintained the diagnosis of ADHD and 98% maintained the comorbid diagnosis. Of the 14 referred adults with ADHD and bipolar disorder, using the subtraction method, 79% maintained the diagnosis of ADHD and 64% maintained the diagnosis of bipolar disorder.

In the same group, using the proportional method, 86% maintained the diagnosis of ADHD and 93% maintained the comorbid diagnosis. Of the 59 referred adults with ADHD and generalized anxiety disorder, using the subtraction method, 75% maintained the diagnosis of ADHD and 76% maintained the diagnosis of generalized anxiety disorder. In the same group, using the proportional method, 90% maintained the diagnosis of ADHD and 90% maintained the comorbid diagnosis. The results of this study demonstrate and support the hypothesis that an individual with both an ADHD and comorbid diagnosis has both ADHD and a comorbid disorder. The majority of adults with an ADHD diagnosis cannot contribute the disorder to overlapping symptoms of another disorder, and adults with a comorbid diagnosis cannot contribute the disorder to overlapping ADHD symptoms.

Studies with adults involving ADHD are not limited to mood, conduct, and developmental comorbid disorders. The importance of identifying the different subgroups of individuals with ADHD and another condition is critical for matching the specialized treatment for the individual in a specific subgroup. Schubiner et al. (1995) found that psychopharmacological medications for substance abuses may reduce barriers to treatment for those adults with both ADHD and substance abuse conditions. Biederman, Wilens, et al. (1995) found that ADHD was a significant risk factor for substance abuse disorders in adults. Wilens, Biederman, Mick, Faraone, and Spencer (1997) found a close association of psychoactive substance abuse disorders and comorbid ADHD symptoms in adults. Schubiner et al. (2000) found that over 25% of adults, upon entering a substance abuse treatment facility, were diagnosed with ADHD. Milberger, Biederman, Faraone, Chen, and Jones (1996) found a significant positive relationship of ADHD in children and smoking



by mothers during pregnancy. Carlton et al. (1987) found a significant relationship in adults between ADD and pathological gambling. Kafka and Prentky (1998) found a significant relationship in adults between ADHD and aggressive forms of sexual impulsivity. These studies reflect the importance of targeting young adults with ADHD for specialized treatment programs due to the unique characteristics of the comorbid disorders, which include learning disabilities that may impact the student's academic success.

## ADD AND LEARNING DISABILITIES

In conjunction with the close association of ADD and school behavior, depending on the definition used, between 10 to 80% of those with ADHD have a co-occurring learning disability. ADD is not a specific learning disability but is just one kind of a learning disorder similar to dyslexia, developmental language disorders, autism spectrum disorder, and acquired memory disorder. Learning disabilities are a subset of a learning disorder and impair a specific ability (Hallowell & Ratey, 1994). In the Regulations Governing Special Education Programs for Children with Disabilities, ADD is defined as "other health impairment", which means having limited strength, vitality, or alertness that adversely affects a child's educational performance (effective March 27, 2002). Learning disabilities (LD) often cause problems in a student's reading, writing, speech, and mathematic understanding (Salus & Bello, 2000). Academic problems may be associated with difficulties in learning processes, which include visual perception; auditory perception; spatial perception; motor skills; and memory, sequencing, and organization. This difficulty may result in lower academic achievement for students with ADHD, reflecting grade retention and school suspensions. Over 30% of those students diagnosed

with ADHD drop out of high school, compared to 10% of a control group of a normal student population, and only 5%, compared to 41% of a control group completed a college degree program (Barkley, 1990). ADD is not an excuse for an individual's failings but, rather, an explanation that can lead to steps to overcoming these obstacles, which in the past have caused feelings of hopelessness and failures in school academics.

Studies have shown (Gittleman, Mannuzza, Shenker, & Bonagura, 1985; Rapport, Scanlan, & Denney, 1999; Weiss & Hechtman, 1993) that children and adolescents with ADHD have problems with poor grades and school failure. There has been limited information and research, especially with adults (Ingersoll & Goldstein, 1993; Rashid, Morris, & Morris, 2001; Wren, 2000), to discover if the academic problems are due directly to ADHD or if there is a separate issue of a co-occurring LD. Faraone, Biederman, Monuteaux, Doyle, and Seidman (2001) compared 140 boys diagnosed with ADHD to a control group of 120 boys with no diagnosis of ADHD at one-year and four-year intervals. Cognitive functioning and LD were assessed using the Wechsler Intelligence Scale for Children-Revised (WISC-R), the Wide Range Achievement Test-Revised (WRAT-R), and the Gilmore Oral Reading Test. To measure social functioning, the Global Assessment of Functioning Scale and the Social Adjustment Inventory for Children and Adolescents were used. School dysfunction was assessed through repeated grades, placement in special classes, and need for tutoring. Of the ADHD group, 40 individuals were identified with a LD (ADHD+LD) and 100 were identified with no LD (ADHD-LD). The comparisons showed that, at baseline, both ADHD groups had more impaired scores on the WISC-R and the WRAT-R than the control group, though the ADHD-LD group's performance on the reading test was not significantly different than

that of the control group. At the four-year follow-up, both ADHD groups remained more impaired than the control group on all the cognitive and achievement measures, while the ADHD-LD group continued to show no difference on the reading test, compared to the control group. At baseline and at the one-year follow-up, both ADHD groups had higher rates of remedial tutoring and placement in special classes than the control group, while at the four-year follow-up, the ADHD+LD group had the highest rate of impairment. The ADHD+LD group had a higher rate of repeated grades at baseline and at the one-year follow-up, as compared to the ADHD-LD and control groups, while there was no difference between the latter groups. These results demonstrate that, although individuals with ADHD symptoms are at risk for academic difficulties, those individuals with ADHD and a co-occurring LD show an even greater risk for academic failure. This study also shows that ADHD symptoms alone do not explain academic difficulties, but they cannot be ruled out as a contributing factor.

A study by Marshall, Hynd, Handwerk, and Hall (1997) found that a group of 24 students diagnosed with ADHD when compared against a group of 20 students diagnosed with ADD, scored significantly higher on a math achievement test than the ADD group. The student's age ranged from 6 years to 12 years and 10 months. The ADD group differed from the ADHD group in that the ADD group had more than twice as many diagnosed with a learning disorder than the ADHD group. The study suggests ADD affects math performance in some manner. The study also suggests ADD is a more attention, cognitive, and anxiety disorder; in contrast, ADHD is a more attention, behavior, and impulsive disorder. In addition, it suggests that students with ADD should be screened and evaluated for LD.

In a study to assess the relationship between ADD, ADHD, and a comorbid reading disability, Willcutt and Pennington (2000) evaluated 494 twins with a reading disability and 373 twins without a reading disability. The subject's age ranged from 8 years to 18 years. The two groups were assessed to determine if the subjects met the criteria for ADD with inattentive symptoms or ADHD with hyperactive-impulsive symptoms. The results of the analysis found both boys and girls with the reading disability were significantly more likely to meet the criteria for ADD than the group without a reading disability, but only the boys with a reading disability had a greater rate of ADHD symptoms. These findings may also demonstrate the reason more boys than girls are referred for clinical evaluation, due to the more disruptive behaviors exhibited by boys with hyperactive-impulsive symptoms, than the girls, who mainly exhibited inattentive symptoms.

Mayes, Calhoun, and Crowell (2000) explored the idea that a LD is found more often in individuals with ADHD than the normal population yet is a separate condition from ADHD. The Wechsler Intelligence Scale for Children-III (WISC-III), the Wechsler Individual Achievement Test (WAIT), and the Gordon Diagnostic System were used to identify 119 children and adolescents with and without ADHD, and with and without a LD. The subjects were placed into one of four groups: ADHD and LD, ADHD without LD, LD without ADHD, and no ADHD and no LD. The study showed the subjects without LD but with ADHD had more learning problems than the subjects with no LD and no ADHD and the subjects with LD and ADHD had greater learning problems than the subjects with LD and no ADHD. The study also showed the subjects without ADHD but with LD had more problems with attention than those without LD and those subjects with

ADHD and with LD had more problems with attention than those without LD. This demonstrates that children and adolescents with ADHD and a learning disability have problems with both attention and academic achievement but differ in degree, indicating that as attention problems increase so do the academic difficulties.

Recent studies (Barkley, 2000) suggest there is a strong hereditary predisposition to ADHD and LD, with three to five times as many children with ADHD as children without ADHD having an LD. The studies also show that, though there is a strong co-occurrence of ADHD and LD, the genes are not one and the same (Faraone et al., 1993; Willcutt et al., 2001). An explanation for this tendency is that adults with ADHD tend to have children with a partner that has an LD (Barkley, 2000; Biederman, Faraone, Keenan, Knee, & Tsuang, 1990; Biederman et al., 1995), which is known as nonrandom mating. This theory is based on the concept that when individuals choose mates, education is a characteristic of the mating selection process. If individuals with ADHD or LD are in the same social circles due to their education level, this increases the probability of choosing each other as mates, thereby increasing the probability that their children will carry both ADHD and LD genes. This was not found in a study by Doyle, Faraone, DuPre, and Biederman (2001), who suggest that there is no evidence of nonrandom mating between spouses with ADHD and LD.

An additional problem is that, often, LDs are not identified until college (Dunn, 1995), when abstract reasoning and a greater degree of written work is required by college studies. When an LD is combined with Adult ADD, underachievement becomes progressively worse for these students (Denckla, 2000), as the requirements for independent, integrated, and long-term assignments increase during school. If a student

has high intellectual ability, mild to moderate ADHD symptoms, and has had strong parental supervision, the individual may not have demonstrated any educational problems in middle or high school. Only when academic problems increase to a crisis in college, which is especially true for females (Robin, 1998), are behavioral problems recognized in the individual. Unfortunately, they are often referred to counseling for the student's depression and academic difficulties and not evaluated for adult ADD, due to not having a prior diagnosis of ADHD.

### ETHNICITY AND GENDER ISSUES

ADHD has been a diagnosed mental health disorder for a number of decades, but the focus of the research has mainly involved Caucasian subjects. In one of the few studies involving ethnicity and ADHD characteristics, Ramirez and Shapiro's (1998) findings were that there were no differences between Hispanic and non-Hispanic white children, as rated by non-Hispanic white teachers, though girls were rated lower on inattention, hyperactivity, and conduct problems. In a review of thousands of articles on ADHD, covering the 30 years between 1965 and 1995, Samuel, et al. (1997) found only 16 articles on African-American children ADHD characteristics and no studies involving adult African-American ADHD. Of the 16 child studies, six involved an educational perspective utilizing teachers as the evaluators. The studies evaluated the prevalence of ADHD in educational settings, the majority of the studies finding that the assessors identified African-American students with more ADHD characteristics than any other minority. Six other studies involved the treatment of African-American ADHD characteristics, finding that psychostimulant medication was an effective treatment. The last four studies involved the evaluation of assessment instruments for identifying African-American children ADHD

characteristics, finding no consistent results, due to the use of non-traditional assessment instruments. The lack of documentation of research of ethnicity and its impact on ADHD characteristics suggests an area of need for research that may benefit the identification and treatment of ethnic groups and their possible unique ADHD characteristics. In one of the first studies to utilize ethnically sensitive methods in the evaluation of African-American ADHD characteristics, Samuel, et al. (1998) found that African-American children ADHD characteristics are similar but not identical to Caucasian children ADHD characteristics. One result of this lack of research on ethnicity and ADHD (Barkley, 1998) is that the disorder is often viewed as only affecting middle class Caucasians. The consequence of this attitude (Kendal & Hatten, 2002) is that, when learning or behavioral difficulties occur in Caucasian children, the individual is viewed as having a medical issue, while the African-American child's behavior is viewed as a result of poor parenting, lower IQ, use of substance abuse, violence, or poverty issues. Caucasian parents are able to justify their child's poor academic performance on organic causes (Reid, Maag, & Vasa, 1993) and are therefore not responsible for their child's failures, as well as disassociate themselves from the negative environmental factors associated with poor or minority students. This attitude carries to the parents of minority students. Bussing, Schoenberg, and Perwien (1998) found that fewer African-American parents have heard of ADHD or are told of ADHD than Caucasian parents, while Bussing, Schoenberg, Rogers, Zima, and Angus (1998) found that more Caucasian parents refer to ADHD in medical terms and expect a course of treatment that includes school interventions that address academic and social issues than do African American parents. The attitude is reinforced by primary care physicians (PCP), who are less likely to detect and refer mental health services for girls and minorities

(Bussing, Zima, & Belin, 1998) with ADHD characteristics. There are also differences between minorities and Caucasian children when referred for special education services for placement in either LD or emotional disturbance (ED) programs. Bussing, Zima, Belin, and Forness (1998) found that, even though there are no differences in symptomatology or comorbidity between children with ADHD characteristics in LD as compared to ED programs, those receiving ED services are more likely to be a minority, living with a single parent, and in a lower socioeconomic status group than children receiving LD services. ED programs are seen as more appropriate for emotional and behavioral problems than LD programs, which are seen as appropriate for ADHD characteristics and academic difficulties. Bussing, Zima, Perwien, Belin, and Widawski (1998) found that 44% of the special education students in their study could have been diagnosed with ADHD, and of those that were diagnosed, only half were receiving treatment. The results suggest that minorities, students with an LD, and students with lower socio-economic-status (SES) doubles the odds that a student with ADHD characteristics receives treatment. The study also shows that girls are three to five times at greater risk than their male peers for unmet service needs. The ambiguous definitions (Coutinho & Oswald, 1998) utilized to identify children for either LD or ED programs allow ethnicity and socioeconomic status to influence the decision. This increases the likelihood that a minority student's disability will be misidentified, which denies an appropriate education, due to the more restrictive and behavior-focused ED program and not the LD program that has the academic track.

Another trend that impacts minorities, especially African-American students, due to inappropriate identification, placement, and services, (Oswald, Coutinho, Best, & Singh, 1999) is that, compared to non-African-American students African-American



students are more likely to be identified as either mildly mentally retarded (MMR) or emotionally disturbed (ED). The study also suggests that, as the poverty level increases, the African-American students are more likely to be identified as MMR than ED. The greatest trend was in the wealthiest communities. The African-American students were disproportionately represented as being identified as either MMR or ED and placed in overly restrictive settings, putting the African-American student at a higher risk for educational failure. The African-American student is two to four times more likely to be identified as MMR and one and a half times more likely to be identified as ED than the non-African-American student.

ADHD research (Kendall & Hatten, 1998) is ignoring minorities, resulting in the lapse of health services for this population, with 47% of African-American children with ADHD characteristics, as compared to 70% of Caucasian children with ADHD characteristics, receiving treatment. One reason for this discrepancy in treatment for ADHD between minorities and Caucasians is that large numbers (Spencer & Oatts, 1999) of African-American males are diagnosed with Conduct Disorder, while Caucasian males are diagnosed with ADHD. The consequence of the different diagnoses is that those individuals diagnosed with Conduct Disorder are placed in alternative educational settings or detention, while those individuals diagnosed with ADHD receive medical and academic services. The necessity of accurately diagnosing ADHD in adolescents and providing appropriate medical and academic services is significant. It is estimated that 70% of juvenile offenders and 40% (Kendall & Hatten, 2002) of adult prisoners have significant ADHD characteristics, with 23% to 45% of adolescents identified with ADHD characteristics having juvenile convictions.

A study by Hudziak (2000) suggests that, although African-American girls with ADHD characteristics are equally at risk as their non-African-American peers with ADHD characteristics who have families with a high prevalence of ADHD, the African-American girls with ADHD characteristics are at a greater risk for lower rate of treatment. In a study by Seidman, et al. (1997), findings suggest that girls with ADHD characteristics, in comparison to a control group matched for age, parental socioeconomic status, and school grade, have significant differences. The girls with ADHD characteristics reflect lower IQ scores (106 versus 112) and are more likely to have a learning disability (21% versus 3%). The girls with ADHD characteristics are also more likely to have comorbid disorders of depression or conduct or multiple anxiety disorders (54% versus 3%) and to have a family history of ADHD (61% versus 14%). Kato, Nichols, Kerivan, and Huffman (2001) suggest from the results of their study that there are differences between younger and older girls with ADHD characteristics. Older girls with ADHD characteristics were more likely than their younger peers to have a comorbid diagnosis of depression and be validated by teachers who recognized the internalizing characteristics. The same older girls also had higher verbal IQ scores, which is inconsistent with prior studies that found lower verbal IQ scores in girls with ADHD characteristics (Seidman, et al., 1997). A possible explanation (Kato, Nichols, Kerivan, & Huffman, 2001) is that the older girls with a higher IQ are able in earlier academic situations to compensate for the ADHD characteristics that are creating academic difficulties. As these students become older and academic studies become harder, their higher IQ does not compensate for these additional difficulties, creating internalization of these characteristics and causing depression. Only after the internalization characteristics become serious enough for parents and teachers to

recognize are the older girls with ADHD characteristics referred to a clinical setting for diagnosis and treatment. In relationship to Conduct Disorder, a Disney, Elkins, McGue, and Iacono (1999) study suggests that, though conduct disorder increases the risk of substance abuse, there is no significant gender difference in the effect of ADHD characteristics and conduct disorder on substance abuse. Other studies involving gender and ADHD characteristics focused on the impact of the family and the transmission of ADHD. Biederman, Faraone, and Monuteaux's (2002) findings suggest that adversity in a child's environment, which includes lower social status, maternal psychopathology, and family conflict, creates a greater vulnerability for boys than girls to ADHD. Faraone, et al. (2000) findings suggest that the relatives of girls with ADHD have a higher prevalence of ADHD characteristics than the families of their peers who do not have ADHD. This prevalence of ADHD characteristics in families of girls with ADHD was similar to the prevalence in families of boys with ADHD. Doyle, Faraone, DuPre, and Biederman's (2001) findings suggest that girls whose families have higher incidents of ADHD characteristics and LD are at greater risk for ADHD and LD than their peers whose families do not have ADHD characteristics. A study by Biederman, et al. (2003) to determine if stimulant medication for the treatment of ADHD in girls has an effect on their puberty development and growth found no effect on their development and growth. To gain information on whether self-report characteristics vary across gender and country, DuPaul, et al. (2001) did an evaluation of college students in New Zealand, Italy, and the United States. The evaluation was not diagnostic, since the study was of self-reported characteristics. The study found that 2.9% of the men from the U.S., 7.4% of the men from Italy, and 8.1% of the men from New Zealand reported significant characteristics.

The results for the women were that 3.9% from the U.S., 1.7% from New Zealand, and none from Italy reported significant ADHD characteristics.

Another importance of correctly diagnosing and administering the appropriate mental health and special education service is that only 15.6% of those with a disability, which includes LDs (Johnson, Stodden, Emanuel, Luecking, & Mack, 2002), and less than a high school diploma are employed. Of those individuals with a disability and a high school diploma, 30.2% are employed. Of those individuals with a disability and at least some postsecondary education, 45.1% are employed, and of those with a disability who completed a four-year college, 50.3% are employed. Of those students who have an LD, 17% to 42% (Scanlon & Mellard, 2002) are found to drop out of high school, against a national dropout average of 12%. Those students with an LD who do drop out are typically minority males from urban low-income homes. In a longitudinal study in trends of postsecondary school enrollment of out-of-school youth with disabilities, which include those students with an LD, Blackorby and Wagner (1996) found that youths with disabilities are less likely to attempt postsecondary education. Of those students who do not drop out of high school, 54% (National Center for Education Statistics, 1999) enroll in a four-year college versus 41% of those with disabilities. Of the undergraduates entering college, approximately 6% report having a disability, and of those, 29% report having an LD. Those with LDs are more likely to be male (50% versus 44%) and white, non-Hispanic (81% versus 71%) with 8% Hispanic, 7% African-American, 2% Asian, and 2% being Native American.

Two of the main supports for the continuing access to college for those with an LD are Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities

purposes, as well as the college's positive attitude toward psychological services, is essential.

#### ADULT ADD AND COLLEGE STUDENTS

In a 1995 published article, Faigel addresses his concerns that ADD was reported to be the second most common disability affecting college students yet remained highly misunderstood and frequently underdiagnosed. Only LD are more common among adults, with more than 30% of students with ADD having co-occurring LD. Students with ADD characteristics were seen as underachievers, often drifting off in the middle of class, and often missing lesson material. Teachers saw these same students as daydreamers, disorganized, and never finishing what they started. Often the students either were often messier than other students or lived by their lists and were so compulsively neat that roommates were uncomfortable and had difficulty living with them. Although the difficulties of impulsivity, concentration, and distractibility created problems in the classroom, they also created problems for the student in everyday life including jobs, careers, interpersonal relationships, behavior, and conduct. Even though they had a history of doing poorly academically, when college students with adult ADD were diagnosed early and given appropriate therapy, they performed as well as their peers. It remains a concern for colleges that students with ADD symptoms can be found at any college student health or counseling service yet continues to be under diagnosed and misidentified.

This same concern was addressed by Heiligenstein and Keeling (1995) at the University of Wisconsin-Madison in a study that reviewed the charts of 42 college students who had been diagnosed with ADHD in 1993. All diagnoses were made by the treating psychiatrist using the *DSM-IV* criteria and the Brown Attention Activation

Act of 1990. These laws require that institutions of higher education not discriminate against those with disabilities. Subpart E of Section 504 pertains to postsecondary education, stating that institutions must provide academic adjustments that do not compromise the essential requirements of a course or program (Scott & Gregg, 2000). ADD meets the definition of an LD when it substantially limits a major life activity, which includes educational progress. College students who provide documentation of the disability and are qualified for the program are entitled by law to appropriate academic adjustments, services, and support (Latham, 1995). Though these laws do not specifically state the design and implementation of adjustments and accommodations, the inclusion of programs to support those students with mental health issues and LDs that may impact a student's academic achievement is essential to colleges' services. In a 1995 article, Richard states that she feels that educators and counselors providing disability services must be able to explain and justify their recommendations. These educators and counselors also need to continue the development of empirical information and evidence in order to provide the best services for their students and clients. Not only is there a need to develop programs and train faculty, there is a need to maximize the utilization of these services to ensure that African-Americans and other minorities are provided the same opportunities for support and treatment. A concern is that African-American college students do not utilize college mental health services to the same extent as non-African-American students. Delphin and Rollock's (1995) findings from their study suggest that students' ethnic identity does not directly impact their use of services but rather their own attitude toward and awareness of available services. To promote the maximum use of appropriate mental health services by African-American students, information on types, locations, and

purposes, as well as the college's positive attitude toward psychological services, is essential.

#### ADULT ADD AND COLLEGE STUDENTS

In a 1995 published article, Faigel addresses his concerns that ADD was reported to be the second most common disability affecting college students yet remained highly misunderstood and frequently underdiagnosed. Only LD are more common among adults, with more than 30% of students with ADD having co-occurring LD. Students with ADD characteristics were seen as underachievers, often drifting off in the middle of class, and often missing lesson material. Teachers saw these same students as daydreamers, disorganized, and never finishing what they started. Often the students either were often messier than other students or lived by their lists and were so compulsively neat that roommates were uncomfortable and had difficulty living with them. Although the difficulties of impulsivity, concentration, and distractibility created problems in the classroom, they also created problems for the student in everyday life including jobs, careers, interpersonal relationships, behavior, and conduct. Even though they had a history of doing poorly academically, when college students with adult ADD were diagnosed early and given appropriate therapy, they performed as well as their peers. It remains a concern for colleges that students with ADD symptoms can be found at any college student health or counseling service yet continues to be under diagnosed and misidentified.

This same concern was addressed by Heiligenstein and Keeling (1995) at the University of Wisconsin-Madison in a study that reviewed the charts of 42 college students who had been diagnosed with ADHD in 1993. All diagnoses were made by the treating psychiatrist using the *DSM-IV* criteria and the Brown Attention Activation

Disorder Scale, a self-report instrument developed to assess adolescents and adults for an expanded construct of ADHD. Records were reviewed for: presenting problems, as defined by the student's chief complaint; recent associated problems, such as legal problems and comorbid disorders; previous evaluations, such as school and psychological assessments; and associated problems in childhood, such as descriptive concerns corroborated by parents or school records. The students included 29 men and 13 women, ranging from 18-46 years old with the group having a mean age of 27 years old. The presenting problems were ADHD symptoms (55%), mood symptoms (21%), nonspecific learning disability (10%), and academic underachievement (14%). Associated problems were depressive disorders (26%), anxiety disorders (5%), drug and alcohol abuse or dependency (26%), legal problems (12%), learning disabilities (2%), and eating disorders (2%). Some students had multiple responses, with 45% having no comorbidity responses. Thirty three percent of this group had previous evaluations for academic or behavioral problems as children, and 36% had evaluations for psychological problems for non-ADHD symptoms. Associated problems included 64% with a childhood history of educational underachievement, 7% with LD, and 14% with behavioral problems. This study shows the problems and history of previously undiagnosed ADHD in undergraduate and graduate students. The number of previous evaluations for these students is an indication of how difficult it is to differentiate between ADHD symptoms and other psychiatric problems. The number of years their ADHD symptoms went undiagnosed also reflects the ability of many students to compensate for and mask their ADHD symptoms. Therefore, college mental health providers and student counseling and mental health centers need to be aware of unrecognized ADHD symptoms in students that may present themselves for other co-



occurring problems. Young adults with ADHD face increased risk of lower academic achievement but, as this study reflects, still are able to function at a high academic level. These students were able to compensate partially for their deficits and had performed adequately at lower levels of school. This study was not, however, intended to measure the frequency of ADHD symptoms as a cause of poor academic performance or its prevalence among college students. Additional research is needed to address those concerns.

Heiligenstein, Conyers, Berns, and Smith (1998) took the issue a step further when they assessed 448 students at the University of Wisconsin-Madison for ADHD symptoms using a *DSM-IV*-based self-report version of the ADHD rating scale. Each of the nine symptoms for the inattentive criteria and the nine symptoms for the hyperactive-impulsive criteria was reworded to be more appropriate for adults since the *DSM-IV* criteria are based on childhood. Each response was expanded to 'rarely or never', 'sometimes', or 'often or very often', but only the often or very often was scored as presence of a symptom. After compiling the scores, 4% of the students tested met the cutoff of a minimum of six symptoms out of nine using the *DSM-IV* criteria for ADHD. No differences were found with respect to gender, ethnicity, education level, or inattention symptoms, but the hyperactive-impulsive symptom was negatively related to age. An evaluation of the responses and scores for statistical significance findings suggested that the *DSM-IV* cutoff scores were set too high for college students and that a cutoff score of four on the two symptoms lists, would be sufficient to identify a college student as distinct from his or her peers. Using the cutoff score of four symptoms, rather than the current *DSM-IV* cutoff score of six symptoms, the prevalence of students with ADHD symptoms

increased to 11% of the students tested. Because checklists cannot reflect the exact symptom content, severity, or impact implied in the *DSM-IV* unless specifically asked by a clinician, the rigid criteria threshold set fourth in the *DSM-IV* is too high when applied to college students. As a consequence of the *DSM-IV* criteria for ADHD being based on childhood symptoms, clinicians evaluating college students with ADHD need to expand their assessment tools to include additional rating scales, psychometric testing, and extensive background information from school and family members in order to achieve an accurate diagnosis.

While there has been research on differences between college students with ADHD and those without the disorder, there is another group that needs to be considered: those with self-reported-only (SRO) ADHD. These students report both childhood and current symptoms but have not been clinically diagnosed. A study by Richards, Rosen, and Ramirez (1999) assessed, selected, and placed 193 students into one of three different groups: the Confirmed ADHD group ( $n = 29$ ), the Non-ADHD group ( $n = 146$ ) and the SRO group ( $n = 18$ ). The Semi-structured Interview for ADHD Adults, the ADHD Behavioral Checklist for Adults, the ADHD Behavioral Checklist for Adults (Retrospective), the Wender Utah Rating Scale, the Symptom Checklist-90-R and the Conduct Disorder scale were given to each student. Each group was then compared in several sub-scales: somatization, obsessive-compulsiveness, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. There were significant differences between the Confirmed ADHD group and the Non-ADHD group in all categories, while there were no differences between the Confirmed ADHD group and the SRO group except for the paranoid ideation sub-scale. Using these tests,

the results show similarity in reported symptoms between Confirmed students with ADHD and SRO students with ADHD. This study also found that the students reported the necessary criteria for an ADHD diagnosis, but their parents did not agree with the student's recall of childhood symptoms. This conflicts with Wender (1995), who found parents' recall of the patient's childhood behavior as more valid. This study reflects the need for awareness in order to correctly diagnose college students with Adult ADD so as to assist them in their academic environment.

Another study at the University of Wisconsin-Madison by Heiligenstein, Guenther, Levy, Savino, and Fulwiler (1999) intended to investigate and examine the psychological and academic impairments to college students not previously diagnosed with ADHD. The charts of 508 students that were voluntarily presented at Counseling and Consultation Services for an initial assessment during the 1997, Fall semester were retrospectively reviewed. Excluding those students who had an active comorbidity, 54 students were identified with either a documented diagnosis of ADHD or a request for career counseling. Those students (26) that were identified with ADHD also had a Brown Adult ADHD Rating Scale score greater than 50, a report of childhood symptoms of ADHD, and a Test of Variables (TOVA) consistent with ADHD. The control group consisted of 28 students who had come to the center with career concerns and requesting the Strong Career Interest Inventory. Information was collected on their grade point average, number of enrolled credits, and academic probation status. All the students were also given the Inventory of Common Problems (ICP), which is a self-report measure of depression, anxiety, academics, interpersonal relationships, physical health, substance abuse, and lethality (tendency toward suicide or homicide). The results showed no statistically

significant differences between groups in age, gender, ethnicity, or level of education. The group with ADHD had a significantly lower mean grade point average and was more likely to be on academic probation. There were no differences in enrolled credits. The ADHD group also reported significantly more academic problems than the control group but reflected no differences in depression, anxiety, interpersonal relationships, physical health, substance abuse, or lethality. The differences in grade point average and academic probation suggest that college students diagnosed with ADHD are true cases, with a specific pattern of impairment, and not solely influenced by comorbid disorders or disabilities. Knowing and understanding the symptom of academic impairment in ADHD is especially important, as discovered in this study, since most of these students did not have apparent childhood academic problems. These results suggest that academic problems and identification of ADHD symptoms may be related to external influences, such as difficulty in a particular school, loss of family structure in support of academic success, or loss of individualized educational services.

The correlation between current quality of life, family of origin relationship dynamics, and ADHD symptoms in college students was explored by Grenwald-Mayes (2002) to determine if a strong family relationship had a greater positive impact on students with ADHD than students without ADHD. A group of 37 college students previously diagnosed with ADHD, which consisted of 18 male and 19 female students, with a mean age of 24 years, and a group of 59 college students never diagnosed with ADHD, which consisted of 22 male and 37 female students, with a mean age of 28, were compared. A self-report background information form was used to collect demographic information, along with the Quality of Life Questionnaire, the Family Environment Scale,

and the Family Adaptability and Cohesion Evaluation Scale. The results showed that the college students with ADHD reported a lower quality of life, as compared to the students without ADHD. The results also showed that the parents of students with ADHD had higher education and employment levels, as compared to the parents of students without ADHD. The students with ADHD were more likely to have family members with ADHD, as compared to the family members without ADHD. The students with ADHD reported more problems with alcohol, drugs, and arrests and experienced a higher level of LD (32.4% verses 3.4%) than the students without ADHD. The findings also found that the college students with ADHD showed a stronger relationship between family of origin dynamics and quality of life, as compared to the college students without ADHD. The results suggest that the higher levels of education and employment in the parents of college students with ADHD might have provided the students with additional support that allowed them to pursue the same college education and academic success as the students without ADHD. The results suggest that the strong family relationships in the ADHD group also provided additional support and helped to minimize the effects of frustration due to the difficult academic and environmental factors the students with ADHD experienced while in college.

This previous study is particularly significant for students with ADD since it demonstrates the continuing need for a supportive family during the student's difficult college years. For college students who do not have a supportive family on which to rely, ADHD symptoms have additional significance. In a study by Biederman, et al. (1995), a group of 140 children with ADHD were compared to 120 children that were non-ADHD for family environment adversity factors. The children were Caucasian and between the

ages of six and 17 years. The results showed there was a strong relationship between adversity in the family environment and ADHD due to chronic conflict, decreased family cohesion, and exposure to parental psychopathology factors. These factors occurred more often in ADHD families than in non-ADHD families.

## COLLEGE RETENTION

As the cost of a college education continues to increase and the number of high school graduates decreases, colleges and universities are increasingly focusing on ways to retain students. Hundreds of studies (Johnson, 1997) have been conducted in an attempt to identify causes for the attrition and failure to complete a college degree. Tinto (1993) found that approximately 25% of first year freshmen drop out of college and nearly 75% of those who leave do so during or immediately after the first semester. The purpose of Johnson's study (1997) was to identify factors differentiating those students who stayed in a commuter college and those students who dropped out of commuter college. One hundred seventy one first time, full-time freshmen were identified and given a survey to complete, then data on these students was provided through the university's Integrated Information System. The gathered information included how satisfied they were with their social and academic experience; their perceptions concerning the quality of the faculty, courses, and facilities; their opportunity for interaction with faculty and other classmates; and the general comfort level within the college community. The data included demographic information, dates of graduation, or when they dropped out, number of courses enrolled each semester, GPA, and if the student had completed any developmental courses at the school. The students were followed for a six-year period. Four variables had the greatest significance: GPA, student beliefs, academic climate, and gender. Compared

to the students who dropped out, the students who graduated had a higher GPA. The retained students agreed more often with the statements concerning student beliefs and academic climate, including: "I got to know the faculty", "It was easy to get answers to questions I had about things related to my education at this institution", "This institution has a well-educated faculty", and "I had the opportunity to interact with faculty". These responses suggest those students who get the help they may need are more likely to be retained in school. These responses to student beliefs and academic climate are supported by Tinto (1982), who states that the more time faculty can give to their students, the greater the likelihood the students will complete their degree. As for gender (Johnson, 1997), a greater percent of female students than male students dropped out of college, which also agrees with Tinto (1975) and Pascarella (1984), who felt that student beliefs and academic climate were the greatest cause of the attrition rate for women.

Ting and Robinson (1998) attempted to identify cognitive and psychosocial factors that attributed to college retention for freshmen, who have the greatest drop-out rate in four-year colleges (Tinto, 1975, 1982, 1993). In their study, they evaluated the academic performance of 2,600 Caucasian and African-American freshman students, measuring four cognitive and 38 psychosocial and demographic factors, using a Non-Cognitive Questionnaire and the First Year Student Survey. The intent of the study was to determine the effectiveness of cognitive and psychosocial factors in predicting first-year freshman students' GPA and retention. Though high school GPA was the most common factor in each group for retention and freshman GPA, there were different significant factors, depending on ethnicity and gender. For Caucasian males, the significant factors were high school GPA, SAT-total, course load, father's education level, positive self-concept, level

of personal development, musical ability, age, and long-term goals. For African-American males, the significant factors were SAT-math, intent for highest education level, and number of dependants in parents' family. For Caucasian females, the significant factors were high school GPA, SAT-total, science skills, long-term goals, positive self-concept, course load, housing types, father's education level, and importance of personal development. For African-American females the significant factors were high school GPA and father's education level. These results demonstrate the importance of different factors significantly influencing a particular group, therefore requiring several models for predicting academic success and retention, depending on the ethnicity and gender of the student.

The importance of psychosocial factors impacting on predicted academic performance and retention is supported by an earlier study by Ting (1997). The group that was studied consisted of 124 Caucasian freshmen that were admitted to the university on probation. The incoming freshmen had an ACT scores of less than 20 and were in the lower 40% of their respective high school classe. They were required to achieve at least a 2.0 GPA during their freshman year. The results of the study showed that the significant psychosocial factors for predicting GPA were successful leadership experiences, preference for long-range goals, acquired knowledge in a field, and a strong support person. The significant psychosocial factor for predicting freshman retention was demonstrated community service. When the findings of this study are compared to the later study of Ting and Robinson (1998), they reflect that not only is a student's ethnicity a significant predictor of academic performance and retention but also the circumstances of how a student is admitted need to be considered.



Feenstra, Banyard, Rines, and Hopkins (2001) investigated additional psychosocial factors. Their study was to determine: whether family environment or family structure is more predictive of adjustment to college, whether lower conflict within the family and more positive family coping skills are related to positive adaptation in college, whether more active individual coping skills are related to positive adaptation in college, and whether family conflict and coping skills are associated to adaptation to college through individual coping. To gather the desired information, surveys were given to freshman students during the Fall semester. The surveys included the Family Environment Scale-Conflict sub-scale, the Family Crisis Orientation Personal Scale, the Holahan and Moor's Coping Scale, and the Student Adaptation to College Questionnaire. The information analyzed from the data collected showed that characteristics from both the family and the student's coping were important to college adjustment. The data showed that family environment, more so than family structure, is related to adaptation in college. Family coping and the individual's coping are related to successful adaptation in college, particularly the student's coping skill developed within the family dynamic. The data shows that a student's coping skills, help in adapting in college, but family conflict continues as an influence on college adjustment. This study suggests students who enter college from families that have fewer resources and coping strategies are at a greater risk of unsuccessfully adjusting to college, and college counseling centers are an important link in identifying students' healthy coping skills. Another way to view the psychosocial factors of incoming freshmen is to characterize the transition to college and the loss of family and friends as a form of grief. Paul and Brier (2001) studied the effect of 'friendsickness' on pre-college predictors with college adjustment. They found over half of the incoming

freshmen studied had experienced moderate to high friendsickness. The data suggests that the freshmen preoccupied with concerns about the loss of pre-college friendships showed poorer adjustment to college. The distress associated with the transition to college life could be reduced through the development and presentation of grief coping skills to incoming freshmen, assisting in the retention of freshman students.

Due to the decrease of traditionally academically prepared freshman, social pressures, and the attempt to be more accessible to diverse groups, colleges and universities, for the last several years, have been admitting students who are not academically ready (Ting, 1997) or who may also lack self-regulatory skills for college life. In a 1995 study, Thombs wanted to measure five problem behaviors in first semester college freshmen and their impact on the student's adjustment to college life and academic achievement. The five problem behaviors measured were study habits, time management skills, relations with faculty, control of alcohol use, and self-defeating behaviors in general. The concept behind problem behavior theory is that variables represent either instigations or controls that generate proneness or probability of a problem behavior and that multiple problem behaviors tend to cluster in the same individuals. After completing four questionnaires and testing instruments that assessed common student problems, the 576 freshman students were divided into two groups, those who scored three or more of the five problem behaviors and those who scored two or less. These groups were then divided into two additional groups, those who earned a 2.0 GPA or higher in their first semester and those students who earned less than a 2.0 GPA and were placed on academic probation. The results of the study showed that the problem behavior group consisted of 28% of the entire study group and was overrepresented by special admission students. The

problem behavior group also had lower levels of goal-directedness and self-esteem. The probation group had more study habit problems, career plan uncertainty, and time management problems than the non-probation group. This study shows that conventional college programs focusing on one or two issues may be too narrow in focus.

Freshman orientation programs and seminars are often used to help freshman students transition from high school to college. They are developed to provide assistance and information on support services available through the school, as well as procedures for registration and class scheduling (Knab, Cashman, & Sullivan, 2000).

Fidler and Hunter (1989) state there is ample evidence that freshman seminars are associated with improved freshman retention. At the University of South Carolina where retention research was conducted continuously for 14 years beginning in 1972, studies showed that, in each of those years the freshmen who had taken the freshman seminar course returned for their sophomore year at a higher rate than those freshmen who had not taken the course. Findings demonstrate two important issues for a successful freshman seminar. The first is that the relationship between student and professor is extremely important to the student's satisfaction with the school. The second critical factor in college retention is the importance of integrating freshmen into the campus social system. Though freshman seminars have been around since 1911 (Gordon, 1989) and have been modified over the years, the basic purpose of attempting to help students create a positive attitude toward higher education in general and toward that specific college remains the same. Howard and Jones (1997) designed a study to gather information on the effectiveness of the freshman seminar in different areas, in order to find out the extent to which the seminar increased the perception of being prepared for college, assisted in developing a

college major, enhanced the overall level of confidence as a student and enhanced knowledge about available college resources, and if it enhanced the perceived level of study skill competence. Five classes, consisting of 118 students taking the freshman seminar course, were divided into three groups based on high school GPA. The low group consisted of students who had a 3.0 GPA, the medium group had a GPA of between 3.0 and 3.49, and the high group had a 3.5 GPA and above. Though it was expected that the freshman seminar would benefit the group with the lowest GPA the most, since they might be the least prepared for college, there was no statistical significance among the three groups. The results reflected the seminar was effective in enhancing the student's perception and attitude toward their college experiences. The only area that did not show improvement in any of the three groups was in the student's development of a college major.

Coleman and Freedman (1996) wanted to examine the results of a one credit course offered to students who were already on academic probation, which focused on goal setting, interpersonal problem solving, and social competence. The course was a ten-session program, consisting of group discussion structured in three phases. The first phase addressed helping students identify and clarify the reasons they were in college and what short and long term goals they intended to achieve. The second phase addressed helping the student to develop specific plans and steps to achieve the stated goals. The third phase addressed helping the student develop skills in assertiveness, seeking help, and positive peer relationships. When compared to students who were also on academic probation but had not taken the seminar, the seminar students showed higher rates of removal from academic probation, higher GPA, and a higher ratio of academic credits completed. The

study demonstrates that seminars and programs developed and designed for academically at risk students can be effective in reducing college attrition rates.

Freshman orientation seminars (Astin, 1975) serve two useful functions that reduce attrition rates. Freshman students can be provided with information to familiarize them with the new environment and to allow them to make informed decisions that would better enable them to complete college. The seminar also provides the school the opportunity to conduct research and identify the at risk students for possible counseling and advisement in order to decrease the projected dropout proneness for the student.

### COUNSELING ISSUES

At risk students need an environment that is geared towards early detection and therapeutic counseling, which includes comprehensive mental health services (Lore, 1997). Otherwise the students may withdraw from school and lose the opportunity for educational advancement. To better identify the counseling needs of students, Hepper, Kivlighan, Good, Roehlke, Hills, and Ashby (1994) used a computerized intake interview to assess clients presenting problems at a university counseling center. The Computerized Assessment System for Psychotherapy and Research (CASPER) used 98 questions taken from 25 different intake instruments to assess the presence and severity of 62 complaints in 13 problem categories. Using CASPER, 611 students were assessed and fell into one of nine different clusters: severe and high generalized distress; moderate and low interpersonal concerns; moderate physical, mood, and interpersonal concerns; severe and moderate somatic concerns; moderate chemical concerns; and situational adjustment. Though this type of an assessment tool is systematic, thorough, and easy to administer, a disadvantage is that the student is already aware a problem exists and he or she cannot

manage it alone. What is very important yet often missed (Bishop, Bauer, & Becker, 1998) is, while assessing those that use counseling and mental health services produces valuable information, assessing non-client students is as valuable, due to the fact that students are not often aware of their own needs. Failure to utilize the opportunity for early detection may not only impact student retention but may also deny the opportunity to develop educational and counseling solutions that could have addressed students' emotional and mental problems (Lore, 1997).

In an effort to identify those students that may be more susceptible to college stress, in order to allocate limited counseling resources, Mathis and Lecci (1999) studied the 'hardiness' of college students. Hardiness is defined as the control an individual has over the consequences of life, the commitment an individual has to adding meaning to life, and the level of challenge presented to an individual as exciting and stimulating experiences arise. The study served to examine if hardy students experienced the fewest difficulties in academic, social, emotional, and attachment adjustment. Sixty-three freshman students who were enrolled in an introductory psychology class were given The Personal View Survey (PVS), which assesses hardiness; the Student Adaptation to College Questionnaire (SACQ), which assesses academic, social, emotional, and attachment adjustment; and the Positive Affect/Negative Affect Scale (PANAS) that measures the extent of experienced affective states. For the nine weeks, the students completed self-report summary forms that assessed their stress, physical health, and mental health. At the end of the semester, these scores were compared to the students' GPA and the total number of official health center visits. The results of the study demonstrated a strong correlation between the PVS and SACQ, indicating that as

hardiness increases, better adjustment in all areas also increases. The results showed those students with greater hardiness had with more mental health care visits, while those students with poorer college adjustment also had more mental health care visits. This possibly indicates that hardy students viewed the health care visit as a positive event in being able to control stress, while the students who had poorer adjustment to college viewed a visit as a negative event and a consequence of stress. The findings of this study indicate hardiness is an effective predictor of college adjustment and that, by using screening tools, at risk students could be identified early and could be provided additional assistance, resulting in improved retention rates.

By assessing the self-reported effects of counseling interventions on personal problems of college students, Turner and Berry (2000) wanted to measure the long-term impact of those counseling services on student retention. A total of 2,365 students who had utilized counseling from the college counseling center over a six year period from 1991 to 1996, with a mean total of 473 students per year, were compared to the total student population for that given year, having a mean of 13,405 students over the same six years. The students were assessed using the Initial Contact Form and the Client Satisfaction Survey. On the Initial Contact Form, the students were asked if they were considering dropping out of school, considering dropping classes, or if the problem was affecting their grades. The Client Satisfaction Form assessed counseling outcomes by asking questions that included evaluating the impact of counseling on the student's academic performance and the student's continued enrollment. The results showed that an average of 70% of the college counseling clients reported the personal problems were impacting their academic performance, while 60.7% of the clients indicated that

counseling was helpful in improving their academic performance. Over the six years, the counseled students had an average retention rate of 70.9%, compared to the general student population of 58.6%. There was no significant difference in the two groups for graduation rates. There was also no significant difference in the retention rate of freshmen and that of the general student body. Though it may initially seem that counseling did not have a positive impact on freshmen, considering that studies have shown freshmen have a significantly greater dropout rate than other students (Tinto, 1975, 1982, 1993), having the same rate as other students is actually a significant improvement in retention. This study demonstrates the importance and value of professional counseling services as part of a school's overall retention program.

In another study to determine if obtaining counseling for personal or psychological issues or concerns increased retention, the amount of counseling a student received was investigated to determine a possible influence on student retention by Wilson, Mason, and Ewing (1997). The records of 520 students who had requested counseling for personal concerns but not for academic problems, were reviewed. The student records were placed into one of four groups: those students who had requested services but never received them, students who had received 1-7 counseling sessions, students who had received 8-12 counseling sessions, and students who had received 13 or more counseling sessions. Those students who did not receive any counseling had the lowest retention rate of 65%, compared to the other three groups that had 79% or greater. The review also showed that after the first six counseling sessions, retention rates did not significantly improve. This study again demonstrates the importance of counseling on retention rates for college students.



## SUMMARY

Studies have shown, that even though the *DSM-IV-TR* classifies AD/HD as a childhood disorder, many of its symptoms continue and affect the individual in adulthood; thus, the designation Adult ADD. A unique characteristic of Adult ADD is that, very often, the symptoms of a co-occurring mental health disorder overlap with Adult ADD symptoms, making diagnosing of either disorder difficult. What makes Adult ADD a special concern for the academic field is that studies have shown learning disabilities also co-occur frequently with Adult ADD, creating greater academic difficulties than either Adult ADD or LD alone. Though there have been few studies that have focused on gender or ethnicity, both females and minorities tend to have received less clinical treatment for AD/HD characteristics than their male and Caucasian cohorts, thereby creating the possibility of untreated populations of individuals struggling with Adult ADD.

Heiligenstein et al. (1999) stress the importance of assessing college students that who have academic problems for ADHD. Often student counseling centers and clinicians may not recognize ADHD symptoms, due to a student having no other problems and the misconception that the well-known impairments from ADHD would have made it unlikely for the student to have been admitted to college. Common problems (Bramer, 1996) may not have warranted an evaluation earlier because they had not caused a behavioral problem in school. These symptoms include: distractibility, forgetfulness, boredom, disorganization, procrastination, restlessness, test anxiety, low self-esteem, substance abuse, relationship problems, depression, mood swings, chronic tardiness, poor attendance, and academic underachievement. The ability to identify academically impaired or at risk students with ADHD who otherwise appear well-adapted may facilitate the

development of specialized identification and treatment programs. This may allow college administrators to target their limited campus resources toward those students who are not only academically but also clinically at risk and have the greatest need for services.

## CHAPTER III

### METHOD

#### PURPOSE

The purpose of this study is to investigate the relationship between college students' score on the Old Dominion University Freshman Survey and Brown's measure of Adult Attention Deficit Disorder. This investigation will examine whether student's GPA and the Brown's measure account for variance over and above the predictive measure of the Old Dominion University Freshman Survey. This investigation also will explore whether or not there is an overrepresentation of minorities whose Brown's ADD scores are 55 and above.

Hypothesis 1: There is a relationship between college students' score on Brown's ADD Scales measuring Adult Attention Deficit Disorder and the students' probation score on the Old Dominion University Freshman Survey.

Null Hypothesis: There is no relationship between college students' score on Brown's ADD Scales measuring Adult Attention Deficit Disorder and the students' probation score on the Old Dominion University Freshman Survey.

Hypothesis 2: There will be a relationship between college students' score on the Brown's ADD Scales measuring Adult Attention Deficit Disorder and the college students' GPA.

Null Hypothesis: There will not be a relationship between college students' score on the Brown's ADD Scales measuring Adult Attention Deficit Disorder and the college students' GPA.

Hypothesis 3: While the college students' probation score on the Old Dominion University Freshman Survey is controlled, the college students' score on the Brown's ADD Scales will account for a statistically significant amount of variance in college students' GPA.

Null Hypothesis: While the college students' probation scores on the Old Dominion University Freshman Survey is controlled, the college students' score on the Brown's ADD Scales will not account for a statistically significant amount of variance in college students' GPA.

Hypothesis 4: There will be an overrepresentation of minority college students as compared to European-American college students who score higher on the Brown's ADD Scales measuring Adult Attention Deficit Disorder.

Null Hypothesis: There will not be an overrepresentation of minority college students, as compared to European-American college students, who score higher on the Brown's ADD Scales measuring Adult Attention Deficit Disorder.

## OVERVIEW

The probation score from the Freshman Survey currently is used as an indicator that a college freshman may be at risk for ending his or her first year in academic difficulty. The score from the Brown ADD Scale is used as an indicator of probability of ADD as the number and frequency of the symptoms increase, as reported by the individual. If there is a high correlation between ADD symptoms and the probation score or ADD symptoms and GPA, this could indicate the need for additional counseling accommodation.

## INSTRUMENTS

The Brown Attention Deficit Scales for Adults is designed to identify attention problems (Brown, 1996) rather than hyperactivity, which is the usual problem in children and adolescents with ADHD. The Brown Adult Scales has five sub-scales. The first sub-scale is Activating and Organizing to Work, which focuses on symptoms that include procrastination, difficulty in getting started, difficulty in setting priorities, and problems with completing responsibilities. The second sub-scale is Sustaining Attention and Concentration, which focuses on problems related to daydreaming, distraction, and listening. The third sub-scale is Sustaining Energy and Effort, which focuses on sleeping during the day, inability to finish tasks, and sluggishness in processing information. The fourth sub-scale is Managing Affective Inferences, which focuses on depressed moods, sensitivity, and irritability. The fifth sub-scale is Working Memory and Accessing Recall, which focuses on difficulties in memorizing information and misplacing items. These scales are sensitive to a wide range of cognitive difficulties that are not included in the *DSM-IV* diagnostic criteria and, therefore, have greater sensitivity to the adult population (Triolo, 1999).

The 40 questions used in the Brown Attention Deficit Scales (Brown, 1996) to identify symptoms of the disorder include all the nine inattentive symptoms listed in the *DSM-IV*, though slightly reworded, as well as other symptoms that are associated with ADD, though not included in the *DSM-IV*. The adult version of the test was developed in two phases. A clinical sample of 142 adults previously diagnosed with ADD and a non-clinical sample of 143 adults without ADD was administered the Brown Adult ADD Scales. The clinical sample average score was 77.9, as compared to the non-clinical

sample average score of 30.9. The clinical sample average score was 47 points higher than the non-clinical sample. For the first sub-scale, the clinical sample's average score was 18.6 verses 7.7 for the non-clinical sample. For the second sub-scale, the clinical sample's average score was 19.8 verses 7.5 for the non-clinical sample. For the third sub-scale, the clinical sample's average score was 16.3 verses 5.8 for the non-clinical sample. For the fourth sub-scale, the clinical sample's average score was 12.3 verses 5.4 for the non-clinical sample. For the fifth sub-scale, the clinical sample's average score was 10.9 verses 4.6 for the non-clinical sample. The demographics reported for the clinical sample, as compared to the non-clinical sample include males 44.1 verse 61.3%, females 55.9 verses 38.7%, African-American 15.4 verse 12.7%, Hispanic 11.9 verses 9.8%, and Caucasian 72.4 verse 77.5%. The ethnic percentages of the total U.S. population for the 1990 U.S. Census were African-American 11.4%, Hispanic 8.6%, and Caucasian 76.2%. For internal consistency, the 40 items on the Brown Attention Deficit Scale have an overall Cronbach Coefficient Alphas of .96. For concurrent validity the 40 items cover a broad range of cognitive functions that cannot be directly measured by a single instrument. But the construct can be assessed with a battery of tests that include the WISC-R/WISC-III and the WAIS-R. These subtests measure aspects of attention, short term memory, concentration, and processing speed. The use of the battery of tests is supported by a study by Biederman, Faraone, Spencer, et al. (1993) that reports adults with ADD tend to be impaired on these subtests. These subtests support the construct validity of the Brown Scale that individuals who self-report clinical levels of ADD symptoms on the Brown Ready Scale (Brown, 1996) also have significant cognitive impairments on these subtests, which can then be used to support the diagnosis of Adult ADD. For reliability, the Test-

Retest method was utilized with two weeks between the tests, resulting in a correlation of .87, which is satisfactory for a testing instrument. For discriminant validity, the test was given to individuals that had been diagnosed with ADD through clinical interviews and to those who did not meet the criteria of ADD. Using a cutoff score of 50, the Brown ADD Scales showed a false negative of 4%, with 6% for false positives. Used alone for screening, the Brown ADD Scales can identify a significant majority of those individuals that meet the *DSM-IV* criteria of ADD with inattentive symptoms but not those with hyperactive-impulsive symptoms or those with little evidence of cognitive impairment.

In contrast, the Old Dominion University 2001 Freshman Survey, developed by Calliotte and Pickering, is designed to measure a number of non-cognitive variables that are related to academic performance at the end of the first year. In 1987, it was found that almost 25% of incoming freshman at ODU had less than a 2.0 GPA at the end of the first semester (Pickering & Calliotte, 1996). A student at ODU with a GPA of less than 2.0 is considered to have academic difficulty and subsequently placed on academic probation. Pickering and Calliotte (2002) felt that the traditional cognitive predictors of high school GPA and SAT scores did not accurately predict academic difficulty in first semester freshmen. Therefore, they developed a survey based on non-cognitive predictors. The survey consists of 146 questions in eight categories: reasons for attending college, reasons for choosing this college, experiences during the senior year of high school, self ratings of abilities and traits, attitudes about being a college student, goal setting capabilities, predictions about the future at college, and predictions about involvement during college. Using 55 of the questions, a probation score is developed and utilized to identify students who are at risk for academic difficulty.

The initial research (Pickering, Calliotte, & McAuliffe, 1992) completed a factor analysis of a 120-item survey. Sixteen non-cognitive factors were identified as major areas of potential problems that could lead to academic difficulties and lack of retention, as expressed by students' attitudes, opinions, self-ratings, and their own predictions on the survey. In addition, the non-cognitive variables indicated whether the students had well-defined career plans, if they planned to obtain a degree, if they considered the university to be a major focus of their lives, and if they planned to work 11 or more hours per week during their first year. The probation score was developed by reviewing the percentage of freshmen in academic difficulty for each response on the 120-item survey. The questions were evaluated using cross-tabulations of each item on the Freshman Survey, in their relationship to increased academic difficulty. Responses to the questions are counted as "wrong" answers and are totaled up as the probation score. An item was included on the probation score if it met one of two criteria. Either 30% of the students who were on academic probation chose that response (there were 22% of the freshman class on academic probation) or there was a significant difference ( $p < .05$ ) between the percentage in academic difficulty ( $GPA < 2.00$ ) and to the percentage not in academic difficulty ( $GPA > 2.00$ ) who chose that response. Forty-five items were initially identified to be included in the probation score. The results showed that the higher the probation score the higher the likelihood the student would experience academic difficulty after the freshman year. Those students who received a score of 0-5 were less likely to be in academic difficulty, those with scores of 6-8 had an average chance of academic difficulty, while those with scores of 9 and above had an increased chance of experiencing academic difficulty. Pickering and Calliotte (2003b) found that students with a probation score of 12 or higher had a greater



than 50% chance of academic difficulty at the end of the first semester. The intent and use of the Freshman Survey is to improve advising and counseling practices and to provide a base for referral to the university orientation course during students' first semester.

Additional research to determine the reasons for a positive relationship between freshman orientation courses and the academic performance and retention of its participants (Boudreau & Kromrey, 1994) may further improve students' educational experience and create a greater opportunity for successful graduation.

Calliotte, Pickering, and McAuliffe (1994) identified 125 freshman students with a score one standard deviation above the freshman class using the 1990 Freshman Survey probation score. The students self-selected into one of three treatment groups or chose a non-treatment group that was used as a comparison group. In the comparison group, the students received no treatment. In the dual treatment group, students were enrolled in the orientation course, which was a one credit course taught over a 15-week format that focused on adjustment to the university, study skills, interpersonal development, and career choice. They also received counseling from their academic advisors, with content and number of sessions varying according to the need of the student. In the course only treatment group, students were only enrolled in the orientation course. In the counseling only treatment group, students received only counseling from their academic advisor. At the end of the first year of college coursework, the comparison group, which consisted of at risk students who had not received treatment, had an academic difficulty rate of 65%, as compared to the total freshman class, which had an academic difficulty rate of 27%. Those identified as being academically at risk in the three groups, having received treatment during the year, had an academic difficulty rate of 35%. Students who had received the

dual treatment had the lowest academic difficulty rate of the three treatment groups, with a rate of 29%, as compared with the course only and the counseling only groups, with rates of 40% and 39%, respectively. In addition, 84% of the students in the treatment group were retained, while only 60% of the students in the non-treated group remained in college. For those identified early as having the potential of academic difficulty in their first year of college, this suggests that the greater the involvement in treatment the lower the rate of academic difficulty.

## LIMITATIONS

The use of self-reports is limited in its ability to identify accurately the presence and severity of a symptom, due to an individual's own bias (Brown, 2000). The individual may consider the behavior as normal and be unable to recognize or acknowledge a problem. The individual may also exaggerate the symptom when the behavior deviates from the individual's perception of what is considered optimal. For these reasons, tests alone are not used to diagnose disorders. However, a test can provide valuable information as to whether a symptom is present and the degree of impairment caused by the symptom affecting an individual. A second limitation is the construct and validity of the test because ADHD has gone through numerous changes in conceptualization and definition. Depending on the edition of the *DSM* that was utilized to define ADHD characteristics at the time of a particular research study, subjects could vary in ADHD characteristics from study to study, making assumptions and generalizations towards other groups difficult. The definition of ADD for this research study utilizes the shift in focus from ADHD and hyperactivity to ADD and attention-deficit. This change in conceptualization is reflected in the subsequent revisions of the *DSM*. To address this

change in conceptualization and definition, testing instruments utilizing adult scales have been developed for the assessment of ADHD symptoms. The Brown Attention Deficit Disorder Scales-Adults specifically is designed for individuals 18 years and older. The Brown Scales are different from other instruments used for assessing ADHD in that it focuses on a wider range of inattention symptoms that are not included in the *DSM-IV-TR* list of criteria symptoms.

According to Brown, the designer of the testing instrument, there has been little research into its reliability or accuracy in identifying ADD symptoms and its value in assessing ADD other than that reported in the initial development (personal communication, January 2, 2004). The Brown Adolescent and Adult ADD Scales focuses on the inattentive symptoms rather than the hyperactive and impulsive ADHD symptoms that other tests address. It is important for clinicians to know if the Brown ADD Scales accurately measures what it states that it measures. Rucklidge and Tannock (2002) evaluated the Brown ADD Scales for Adolescents for: its discriminant validity of adolescents identified with ADHD Predominantly Inattentive Type, to normal controls, and to adolescents with a reading disability; its criterion validity by comparing it to the Conner's Rating Scales and the Ontario Child Health Study Scales; and its discriminant capabilities, as compared to the Conner's Rating Scales and the Ontario Child Health Study Scales. The Brown ADD Scales for Adolescents is similar to the adult version, but several of its questions are reworded to be more applicable to adolescents, and it is normed at a higher level than the adult scale. A sample size of 98 adolescents were identified and placed in one of four groups: 41 control subjects, 12 subjects identified with a reading disability, 29 subjects diagnosed with ADHD Predominantly Inattentive Type,

and 16 subjects diagnosed with ADHD Predominantly Inattentive Type and a reading disability. The results of the study showed that when using a cutoff score of 55 on the Brown ADD Scales, which is the cut off score on the adult version, 77.6% of the subjects were identified correctly as either ADD or non ADD. Only one false positive was identified above the cut off score, but 46.7% of the subjects whose scores were below the cutoff score were identified as false negatives. This indicates that if an individual receives a score above the cutoff score, the probability is high that the individual has ADD, but if the individual receives a score below the cutoff score, ADD cannot necessarily be ruled out. This indicates poor sensitivity but good specificity. The study showed that the Brown ADD Scales had good construct validity, in that the subjects that were identified with only a reading disability did not score above the cut off score, possibly demonstrating that the Brown ADD Scales does not incorrectly identify an attention problem as a reading problem. The study also showed that the Brown ADD Scales had better discriminatory features than the self-report scales of the Conner's Rating Scales and the Ontario Child Health Study Scales.

A review of the Brown ADD Scales in *The Fourteenth Mental Measurement Yearbook* (2001) states that the discriminant validity and the internal consistency reliability for the total score were good. However, for the sub-scales, reliability and construct validity were weak. Another concern with the Scales was that the normative population sample was not a representative sample of adults. An additional concern was that there has been only limited research in establishing the Brown ADD model. In spite of these concerns, the Brown ADD Scales remains useful as a screening tool for ADD.

## SAMPLE POPULATION

Freshman and sophomore students who have previously taken the Freshman Survey will be given the Brown ADD Scales-Adult, Ready Score Answer Document to complete. Volunteers will be taken from classes that include, but are not limited to, university orientation, career planning, and introduction to psychology. The goal is to have 150 freshman and 150 sophomore students complete the Ready Score Answer Document. An analysis of the population data between 1999-2002 of entering freshman students at ODU includes 55% female, 59% Caucasian, and 27% African-American (Pickering & Calliotte, 2003a).

The goal of this correlation study is to compare students' probation score with their score from the Brown ADD Scales-Adult, Ready Score Answer Document. These paired scores then will be correlated, and the resulting correlation coefficient (Ary, Jacobs, & Razavieh, 1996) will indicate the relationship between the two variables.

## RESEARCH: DISCUSSION AND PURPOSE

The purpose of correlational research is to study the relationships between variables or to use these relationships to make predictions. Correlational studies (Gay & Airasian, 2000) may be designed to determine relationships between variables or to test hypotheses of expected relationships. This involves collecting data to determine to what degree a relationship exists between two or more variables. The degree of a relationship between these variables is measured by a correlational coefficient. If a relationship does exist between these variables, it means that scores within a certain range on one variable are associated within certain scores of another variable. Correlation coefficients in educational and psychological measures consider between 1.00-.86 as very high, .85-.70

as high, .69-.50 as moderate, .49-.20 as low, and .19-.00 as negligible (Ary, Jacobs, & Razavieh, 1996).

## PROCEDURE

The administration of the Brown ADD Scales for Adults will be coordinated with each class instructor by the examiner. The examiner will obtain permission to administer the scales and promise to minimize disruption to the teaching environment. The examiner will present the scales in written format and will be present to answer questions and collect the completed answer sheets. If the examiner is not able to be present for the administering of the scales, the examiner will train appropriate monitors to ensure standardization of the presentation. Upon completion of the Ready Score Answer Document, the answer scores will be added by the examiner to obtain the Total Score. Each student's Consent and Release of Information Form then will be given to the Institutional Research & Assessment office at Old Dominion University to provide research and documentation of the individuals' Freshman Survey and academic scores, as well as current enrollment status.

## CHAPTER IV

### FINDINGS

#### REVEIW OF DATA COLLECTION METHODOLOGY

The Brown ADD Scales Survey using the Brown ADD Scales Ready Score Answer Document was administered at Old Dominion University (ODU) during the end of the Spring 2004 semester, through Summer 2004 semester, into the beginning of the Fall 2004 semester. The ODU Course Catalog was used to identify freshman and sophomore level classes. Instructors were then contacted through email for the possibility of conducting the survey. Several instructors and a department chose not to allow the survey to be presented during their classes. Class availability and permission was coordinated with the individual instructors. Some instructors chose to allow the survey to be presented at the beginning of the class, while others chose to allow the survey to be presented at the end of class.

Twenty minutes was allotted for the researcher to present and for the students to complete the survey. The researcher read from a script to ensure uniformity in presenting the information, which included the purpose and intent of the research, and the importance of reading, understanding, and signing the Informed Consent Document. In addition, students were encouraged to contact the Student Counseling Center if they became concerned that their feelings or behaviors seemed to fit questions on the survey and that they were also having significant academic or personal problems. Only freshman and sophomore students were asked to participate and complete the survey. The opportunity to win one of two \$50 ODU Bookstore gift certificates was available for those students that volunteered to complete the survey. The survey was administered during a variety of

classes that included: Oceanography, Algebra, History, Statistics, English, Computer Science, Political Science, University Orientation, and Career Planning courses. The researcher presented and collected the surveys and provided clarification as questions arose. Permission was granted through the Informed Consent Document in order to submit the participating students' identification number to the Institutional Research & Assessment Office to obtain the students' Old Dominion University Freshman Survey Probation Score, as well as to the Information Technology for Student Services Office to obtain the students' Fall 2004 Cumulative GPA.

## RESPONDENTS

The respondents only included volunteer freshman and sophomore students; a number of students chose not to participate in the survey. A total of 268 students volunteered to take the survey. Three of the surveys did not have all the required information completed and, therefore, were considered unusable and not included in the analysis. Of the 265 ADD Survey scores, 199 Freshman Survey Probation Scores and 215 Cumulative Fall 2004 GPA were obtained. A total of 170 respondents had both the Freshman Survey Probation Score and a Cumulative Fall 2004 GPA, along with the ADD Survey Score (Table 1).



Table 1  
Overview of Data

Descriptive Statistics	N	Minimum	Maximum	Mean	SD
ADD Scale Total Score	265	2	111	41.97	22.023
ADD Sub-scale Activation	265	1	25	10.58	5.317
ADD Sub-scale Attention	265	0	26	12.22	6.131
ADD Sub-scale Effort	265	0	27	7.74	5.352
ADD Sub-scale Affect	265	0	20	5.58	4.360
ADD Sub-scale Memory	265	0	18	5.92	4.318
Fall 2004 Cumulative GPA	215	.00	4.00	2.5963	.87683
Freshman Survey Probation	199	0	20	4.70	3.486
ADD/GPA/Probation					
Complete Data	170				

#### RESPONDENT DEMOGRAPHICS

The total sample consisted of 265 students. European-Americans represented 57.4%, African-Americans 26.4%, Hispanics 6.4%, Asians 4.2%, Native Americans 0.8%, and other ethnicities 4.9% (Table 2). Males represented 40.8% and females 59.2% of the total sample. The ages of the respondents ranged from 17 to 53 years old (Table 3). The preponderance of the sample, 78%, were either 18 or 19.

Table 2

## Selected Demographics-Ethnicity

Descriptive Statistics	Frequency	%
Ethnicity		
European-American	152	57.4
African-American	70	26.4
Hispanic	17	6.4
Asian	11	4.2
Native American	2	0.8
Other ethnicities	13	4.8
Total	265	100

Table 3  
Selected Demographics-Age

Descriptive Statistics	Frequency	%
<b>Age</b>		
17	15	5.7
18	144	54.3
19	65	24.5
20	21	7.9
21	7	2.6
22	3	1.1
23-53	10	3.9
Total	265	100

Freshman represented 70.2% and sophomores 29.8% of the total sample. Thirty two (12%) individuals stated they had been diagnosed with ADD, 204 (77%) stated they had not been diagnosed with ADD, and 29 (11%) stated they did not know if they had been diagnosed with ADD.

#### STATISTICAL ANALYSIS

SPSS statistical software was utilized to perform analyses of the data. For internal consistency, a Cronbach's Alpha was calculated for the Brown ADD Scales as an index of reliability. This value is often used when the measures have items that are not scored

simply as “yes” or “no” but as a range such as on a scale. The Cronbach’s Alpha was .908, as compared to .96, as reported by the Brown ADD Scales for Adults.

A correlational analysis was conducted to discover whether there was a significant relationship between two variables in Hypothesis 1 and Hypothesis 2. Correlational analysis enables the researcher to determine the direction of a relationship and the strength or magnitude between the two variables. A positive relationship (+) is where high scores on one variable are associated with high scores on the other variable or low scores on one variable are associated with low scores on the other variable. A negative relationship (-) is where high scores on one variable are associated with low scores on the other variable. The strength or magnitude of the relationship between the two variables is referred to as the ‘correlation coefficient’, which ranges from 0 to +1 and 0 to -1 and is a ratio between the variance shared by the two variables. The correlation coefficient used in this research is Pearson’s  $r$ . The correlational analysis also produces an associated probability level ( $p$ ) that indicates the likelihood that the correlation coefficient is caused by sampling error. A general guideline or rule of thumb is that the probability level needs to be  $p < 0.05$  to be statistically significant. When  $p > 0.05$ , it does not mean the data is non-significant or of no interest but that the effect of sampling error needs to be considered in the statistical evaluation of the data. The probability level must be used as one piece of information that needs to be taken into account when interpreting the data (Dancey & Reidy, 1999).

A partial correlation was used for Hypothesis 3 to find to what degree two variables were related in the sample when the common variance of another variable is removed or partialled out. The purpose in partialling out the effects of a control variable or holding the effects of the variable constant is to determine the relationship between the

remaining variables. A partial correlation is used to understand why two variables are related or the possibility of a confounding variable (Kachigan, 1982).

A statistical frequency was used for Hypothesis 4 to analyze data to determine the number of European-American students as compared to minority students, who scored over 55 on the Brown ADD Scales. The purpose was to evaluate if minorities were overrepresented in the ADD population.

A Pearson correlation coefficient was developed to indicate the relationship between variables. For behavioral sciences, a correlation coefficient of .1 is interpreted as small, .3 is interpreted as medium, and .5 and above is interpreted as a high relationship. The square of the correlation is the proportion of the variance that is accounted for in the relationship. For example, if  $r = .3$ , then .09 or 9% of the variance is accounted for in the relationship (Green, Salkind, & Akey, 1997).

#### ADD SCALES AND PROBATION SCORE

Hypothesis 1: *There is a relationship between college students' score on Brown's ADD Scales measuring Adult Attention Deficit Disorder and the students' probation score on the Old Dominion University Freshman Survey.*

Null Hypothesis 1: *There is no relationship between college students' score on the Brown ADD Scales measuring Adult Attention Deficit Disorder and the students' probation score on the Old Dominion University Freshman Survey.*

A correlational analysis was performed to determine the relationship between the students' score from the Brown ADD Scales and the students' Probation Score from the Old Dominion Freshman Survey. A correlation of  $r = .278$  was found and significant at the 0.01 level ( $p = .000$ ). The mean, standard deviation, and number are shown in Table 4.

Table 4

## ADD and Probation Scores Statistics

Descriptive Statistics	Mean	S D	N
ADD Scale Total Score	41.97	22.023	265
Probation Score	4.70	3.486	199

The correlation between the ADD score and the Probation Score was  $r = .278$ . This correlation was statistically significant ( $p = .000$ ), showing a low relationship; therefore, the null hypothesis can be rejected.

## ADD SCALES AND GPA

Hypothesis 2: *There will be a relationship between college students' score on the Brown's ADD Scales measuring Adult Attention Deficit Disorder and the college students' GPA.*

Null Hypothesis 2: *There will not be a relationship between college students' score on the Brown's ADD Scales measuring Adult Attention Deficit Disorder and the college students' GPA.*

A correlational analysis was performed to determine the relationship between the students' Brown ADD Scales score and the students' Cumulative Fall GPA. A correlation of  $r = -.137$  was found and significant at the .05 level ( $p = .046$ ). The mean, standard deviation, and number are shown in Table 5.

Table 5

## ADD and GPA Scores Statistics

Descriptive Statistics	Mean	SD	N
ADD Scales Total Score	41.97	22.023	265
Fall 2004 Cumulative GPA	2.5963	.87683	215

The correlation between the ADD score and the GPA was  $r = -.137$ . This correlation was statistically significant ( $p = .046$ ) showing a low relationship; therefore the null hypothesis can be rejected.

## CONTROLLING FOR PROBATION SCORE

Hypothesis 3: *While the students' probation score on the ODU Freshman Survey is controlled, the college students' score on the Brown's ADD Scales will account for a statistically significant amount of variance in college students' GPA.*

Null Hypothesis 3: *While the students' probation score on the Old Dominion University Freshman Survey is controlled, the college students' scores on the Brown's ADD Scales will not account for a statistically significant amount of variance in college students' GPA.*

A correlation analysis was performed to determine the relationship between the Fall 2004 Cumulative GPA and the Freshman Survey Probation Score; the Fall 2004 Cumulative GPA and the ADD Scales Total Score; and the Freshman Survey Probation

Score and the ADD Scales Score, utilizing the subjects that had complete data for all three criteria. The mean, standard deviation, and number are shown in Table 6.

Table 6  
GPA, Probation, and ADD Scales Score Statistics

Descriptive Statistics	Mean	SD	N
Cummulative GPA	2.5318	.92813	170
Probation	4.88	3.57	170
ADD Scales	42.13	21.921	170

A correlation was found (Table 7) between the Fall 2004 Cummulative GPA and the Freshman Survey Probation Score of  $r = .012$  ( $p = .437$ ), the Fall 2004 Cummulative GPA and the ADD Scales Total Score of  $r = -.098$  ( $p = .102$ ), and the Freshman Survey Probation Score and the ADD Scales Total Score of  $r = .319$  ( $p = .000$ ). Though neither the correlation between the Fall 2004 Cummulative GPA and the Freshman Survey Probation Score nor that of the Fall 2004 Cummulative GPA and the ADD Scales Total Score were statistically significant at the .05 level, the ADD Scales Total Score ( $r = -.098$ ) had a stronger relationship with the Fall 2004 Cummulative GPA than the Freshman Survey Probation Score ( $r = .012$ ). The correlation between the Freshman Survey Probation Score and the ADD Scales Total Score for this population ( $N = 170$ ) showed a medium relationship ( $r = .319$ ) and was statistically significant ( $p = .000$ ) as compared to



the population with the Probation Score and Total ADD Score ( $N = 199$ ) with  $r = .278$  ( $p = .000$ ).

Table 7  
Correlation Statistics

Source of Data	GPA	Probation	ADD
Pearson Correlation			
Cummulative GPA	1.00	.012	-.098
Probation	.012	1.00	.319
ADD Scales	-.098	.319	1.00
Significance (1-tailed)			
Cummulative GPA		.437	.102
Probation	.437		.000
ADD Scales	.102	.000	

note:  $N = 170$

A partial correlation analysis was performed to determine the relationship between the ADD scores and the GPA scores when the variance and effect of the Probation Score was removed from both variables. A partial correlation was found,  $r = -.107$ , but was not significant at the .05 level ( $p = .082$ ). To determine if the relationship was more than a chance deviation or sampling error, the Product Moment Correlation Coefficient table was utilized to determine critical values of  $r$  for selected significance levels. At the .05 one-

tailed level with  $df = 167$ , a value of .151 needed to be exceeded. The relationship between the ADD scores and the GPA scores when the Probation Scores were partialled out was not statistically significant; therefore, the null hypothesis cannot be rejected (Table 8).

Table 8

Controlled Variable: Probation Score

Partial Correlation	ADD score
Fall Cumulative GPA	
correlation	-.107
significance (1-tailed)	.082
$df$	167

#### ADD REPRESENTATION

*Hypothesis 4: There will be an overrepresentation of minority college students, as compared to European-American college students, who score greater than 55 on Brown's ADD Scales measuring Adult Attention Deficit Disorder.*

*Null Hypothesis 4: There will not be an overrepresentation of minority college students, as compared to European-American college students, who score greater than 55 on the Brown's ADD Scales measuring Adult Attention Deficit Disorder.*

A statistical frequency was performed to obtain the representation of European-Americans, as compared to minority students (African-American, Hispanic, Asian, Native American, and other ethnicities), who scored greater than 55 on the Brown ADD Scales. Sixty-seven students scored greater than 55 on the Brown ADD Scales, which was 25% of the total subjects. Of those who scored greater than 55, 44 (65.7%) were European-American and 23 (34.3%) were ethnic minority students, as compared to 152 (57.4%) European-American and 113 (42.6%) combined ethnic minority students in the total sample (Table 9). Therefore, ethnic minority students were not overrepresented in the population that scored greater than 55 on the Brown ADD Scales.

Table 9

Brown ADD Scales Scores Greater than 55

Descriptive Statistics	Frequency	%
Ethnicity		
European American	44	65.7
African-American	16	23.8
Hispanic	4	6.0
Asian	2	3.0
Native American	0	0
Other ethnicities	1	1.5
Total	23	34.3

## DISCUSSION OF THE DIFFERENT SAMPLE SIZES

Due to the different sample sizes that were developed in each of the hypotheses, the same statistical analysis was also conducted utilizing the 'Complete Data' sample size of 170 to determine if there were any differences in the populations that could affect the statistical analysis. The 'Incomplete Data' was the part of the sample size that did not have the Complete Data, which were: the ADD Scales score, the Freshman Survey Probation Score, and the Fall 2004 Cumulative GPA (Table 10). Two areas of the respondent demographics did show differences: the number of freshman and sophomores and the ages

of the subjects that had completed the ADD Scales. There were 150 freshman and 20 sophomores in the Complete Data population and 36 freshman and 59 sophomores in the Incomplete Data sample. The mean age increased from 18.23 in the Complete Data population to 20.36 in the Incomplete Data population. These differences could be explained by the loss of all freshman and sophomore students over 21 years of age in the Complete Data population due to there being non-traditional students who typically do not attend the freshman orientation program, during which the Freshman Survey is completed, or who did not have the new student identification number that was utilized to collect the data. The Complete Data sample size remained within 1 standard deviation of the mean of the original sample size populations and the Incomplete Data population; therefore, the original sample size for each population remained representative of the Complete Data population (170).

Table 10

## Descriptive Statistics

Source of Data	GPA	Probation Score	ADD
Complete Data			
Mean	2.5318	4.88	42.13
SD	.92813	3.570	21.921
N	170	170	170
Incomplete Data			
Mean	2.8398	3.62	41.67
SD	.59498	2.757	22.318
N	45	29	95
Total	215	199	265

## BROWN ADD SUB-SCALES

According to the design of the Brown Adult ADD Scales (Brown, 1996), scores greater than 55 are 'highly probable' of being consistent with an ADD diagnosis.

Individuals who score greater than 55 on the Brown ADD Scales meet the threshold for clinical ADD evaluation. In interpreting the threshold scores, it is important to remember that these scores are developed from self-reported symptoms and that nearly everyone, at one time or another, has the problems referred to on the Brown ADD Scales. Individuals with the diagnosis of ADD have greater severity and frequency of these symptoms, as well

as having their lives impaired by these symptoms. Differences in ratings for similar symptoms occur based on how people consider the seriousness of the symptom for themselves. The Brown ADD Scales are a combination of five sub-scales that can be used in evaluation to obtain additional information about clusters of symptoms for use in developing a specific treatment if ADD is diagnosed. The interpretation of these sub-scales or clusters of symptoms can be useful in identifying an individual's particular problem and any co-occurring disorders, since individuals with ADD are not equally impaired with each symptom.

Sub-scale 1: *Organizing and activating for work*. This cluster of symptoms involves the organizing and initiating of activities. These individuals procrastinate excessively and may have a high threshold for arousal or a high level of anxiety that inhibits action. Individuals who score high on this sub-scale and also sub-scale 3 may be suffering with co-occurring dysthymia. Individuals who score high on this sub-scale and also sub-scale 4 may be suffering with co-occurring anxiety or obsessive-compulsive traits.

Sub-scale 2: *Sustaining attention and concentration*. This cluster of symptoms involves problems with maintaining attention, such as when the mind drifts while an individual is listening or reading. Often these individuals appear to be daydreaming, not paying attention, or lost in their own thoughts. These individuals may have a co-occurring reading disorder.

Sub-scale 3: *Sustaining energy and effort*. This cluster of symptoms involves problems with inconsistent energy or insufficiently sustained effort. These individuals are often accused of being lazy. The symptoms in this cluster may be related to a co-occurring

major depression disorder or dysthymia and may be also associated with a written expressive language disorder.

Sub-scale 4: *Managing affective interference*. This cluster of symptoms involve problems regarding moods and aspects of social interaction. These individuals may have problems expressing anger appropriately and may have sudden outbursts. They are quick to feel annoyed, easily frustrated, and often irritable, due to being highly sensitive to criticism. Often individuals who score high on this sub-scale also score high on sub-scale 1. This cluster of symptoms is also associated with dysthymia and major depression.

Sub-scale 5: *Utilizing working memory and accessing recall*. This cluster of symptoms is related to forgetfulness. These individuals have difficulty keeping track of needed items, keeping appointments and/or and misplacing homework assignments. There may be problems in remembering visual images, such as numbers, but no problems in verbal communication. Additional evaluation for learning disorders may be needed.

#### BROWN ADD SUB-SCALE STATISTICAL ANALYSIS

SPSS statistical software was utilized to perform a correlational analysis between each sub-scale score and the Freshman Survey Probation Score, as well as the Fall 2004 Cumulative GPA, to discover if there was a significant statistical relationship. The correlation between the Activation Scale Score and the Probation Score was  $r = .239$  ( $p = .001$ ), which shows a low but statistically significant relationship. The correlation between the Activation Scale Score and GPA  $r = -.153$  ( $p = .026$ ) shows a low and statistically significant negative relationship. The correlation between the Attention Scale Score and the Probation Score was  $r = .233$  ( $p = .001$ ), which is a low but statistically significant relationship. The correlation between the Attention Scale Score and the GPA



was  $r = -.094$  ( $p = .173$ ), which is not statistically significant. The correlation between the Effort Scale Score and the Probation Score was  $r = .307$  ( $p = .000$ ), which is a low to medium relationship and statistically significant. The correlation between the Effort Scale Score and the GPA was  $r = -.146$  ( $p = .033$ ), which is a low negative relationship and statistically significant. The correlation between the Affect Scale Score and the Probation Score was  $r = .197$  ( $p = .005$ ), which is a low relationship and is statistically significant. The correlation between the Affect Scale score and the GPA was  $r = -.060$  ( $p = .385$ ), which is not statistically significant. The correlation between the Memory Scale Score and the Probation Score was  $r = .194$  ( $p = .006$ ), which is a low relationship and statistically significant. The correlation between the Memory Scale Score and the GPA was  $r = -.142$  ( $p = .039$ ), which is a low negative relationship and statistically significant. Each of the ADD sub-scales had a statistically significant relationship with the Freshman Survey Probation Score, while the Activation, Effort, and Memory sub-scales had a statistically significant negative relationship with the Fall 2004 Cumulative GPA (Table 11).

Table 11

## Sub-scale Statistics

Source of Data	Probation Score	Cumulative GPA
<b>Activation</b>		
Pearson correlation	.239	-.153
Sig.	.001	.026
<b>Attention</b>		
Pearson Correlation	.233	-.094
Sig.	.001	.173
<b>Effort</b>		
Pearson Correlation	.307	-.146
Sig.	.000	.033
<b>Affect</b>		
Pearson Correlation	.197	-.060
Sig.	.005	.385
<b>Memory</b>		
Pearson Correlation	.194	-.142
Sig.	.006	.039

## ADULT ADD CHARACTERISTICS IN THE SAMPLE POPULATION

A total of 265 Brown Adult ADD Scales Total Scores were obtained with 25% of these scores (67 students) greater than 55, which was used as the cutoff score for

significant characteristics. In this group, European-Americans accounted for 66% (44 students), as compared to 57%; African-Americans 24% (16 students), as compared to 26%; Hispanics 6% (4 students), as compared to 6%; Asians 3% (2 students), as compared to 4%; Native Americans 0% (0 students), as compared to 1%; and other ethnicities 1% (1 student), as compared to 5% in the total sample population. In the same population that had scores greater than 55, 45% (30 students), as compared to 41%, were male; and 55% (37 students), as compared to 59% were female; and 72% (48 students), as compared to 70%, were freshmen; and 28% (19 students), compared to 30% were sophomores in the total sample population.

Of those students who completed the survey (265), 12% (32 students) stated that they were previously diagnosed with ADHD/ADD. European-Americans accounted for 78% (25 students), African-American 6% (2 students), Hispanics 10% (3 students), and Asians 6% (2 students) in this population. There were 16 male and 16 female students (50/50) that reported having been previously diagnosed with ADHD/ADD. In this same group, 87% (28 students) were freshmen and 13% (4 students) were sophomores.

## SUMMARY

A correlational analysis was used to determine if there was a relationship between the Brown ADD Scales Score and the Freshman Survey Probation Score, and the Brown ADD Scales Score and the Fall 2004 Cumulative GPA. Statistically significant correlations were found in both groups of variables. When a correlational analysis was performed between the Brown ADD sub-scales scores and the Probation Score, all the sub-scales scores had a statistically significant low relationship with the Probation Score. In the correlational analysis between the Brown ADD sub-scale scores and the GPA, only three

of the five scales remained with a statistically significant low negative relationship, while the other two scales were not statistically significant. The partial correlation between the Brown ADD Scales score and the GPA, while controlling for the Probation Score, was not statistically significant. It was also found that minority students were not overrepresented in the group of students who had scored greater than 55 on the Brown ADD Scales.

## CHAPTER V

## SUMMARY, CONCLUSIONS, RECOMMENDATIONS

## SUMMARY

The intent for this research study was to determine the need for the evaluation of Adult ADD symptoms for college students who may be academically at risk. A review of 33 studies has shown that neuropsychological deficits in adults with ADD characteristics contribute to impairments in attention, behavioral inhibition, and memory (Hervey, Epstein, & Curry, 2004). Educational disability has been demonstrated throughout the school years of these individuals by their greater frequency of repeated grades, academic tutoring, and placement in special classes than those students not identified with ADD symptoms (Biederman, Faraone, Monuteaux, Bober, & Cadogen, 2004). Often these impairments are in the area of spelling and arithmetic skills (Frazier, Demaree, & Youngstrom, 2004) and verbal learning (Roth, et al., 2004). Of special concern to educators is the close association between ADD and reading and arithmetic learning disabilities (Seidman, et al., 2001). The characteristics of ADD and co-occurring disorders increase the risk of academic problems and school failure.

Skeptics maintain that Adult ADD symptoms do not adversely affect an individual's lifestyle, yet studies over the last 40 years have identified clinical characteristics of ADD. The studies have also shown that the prevalence of ADD characteristics is as high in non-American as in American individuals (Biederman & Faraone, 2004). Due to the controversies involving ADHD/ADD, potential behavioral and academic indicators of ADHD/ADD that could have been identified through early intervention services have been ignored. Instead, ADHD/ADD characteristics have had a

negative impact upon individuals' academic progress (Kendall, Hatton, Beckett, & Leo, 2003) that possibly could have been prevented. The continuing denial that ADD symptoms persist into adulthood prohibits the effective treatment of this disorder (Aviram, Rhum, & Levin, 2001). Since the last decade, Adult ADD has been acknowledged to be a valid disorder, but problems remain in solidifying a diagnostic criteria. Current diagnostic criteria is based solely upon school-aged children; clinicians, therefore, need to use their clinical judgment in applying ADD criteria to adults. As an aid in identifying ADD characteristics, rating scales assist in differentiating the severity of symptoms against the normal population (McGough & Barkley, 2004). Self-report rating scales have been developed to assist in the diagnosis and treatment of Adult ADD and are reliable in providing accurate information on current behavior and symptoms (Murphy & Schachar, 2000). The use of self-report rating scales for adults may be more reliable than for children and adolescents, due to the fact that children are referred for evaluation by their caregivers for behaviors the caregivers feel require treatment, while adults primarily seek treatment for behaviors that affect their own well-being (Weiss & Weiss, 2004). The Brown ADD Self-Report Rating Scales for Adults was developed for use in identifying the presence and severity of ADD symptoms (Montano, 2004) in high functioning adults and based on the non-hyperactive ADD characteristics of high school and college students (Murphy & Adler, 2004).

The Brown ADD Self-Report Rating Scales for Adults was used in this research study to identify the current severity of ADD characteristics and their relationship to at risk college freshman and sophomore students' academic concerns. A cut-off score of 55 was used to identify the threshold for significant characteristics. Though 4.7% is estimated

as the prevalence of ADD in the adult population (Biederman, 2004), of the 265 students surveyed, 25% attained scores greater than 55, indicating a 'high probability' of ADD. This can be expected, since an ADD diagnosis using the Brown Adult ADD Scales is not determined by ADD characteristics alone, but also requires the self-reporting of significant problems that are caused by these characteristics in two of three life areas.

Individuals may also have childhood characteristics of inattention, restlessness, mood lability, disorganization, stress sensitivity, impulsiveness, and hyperactivity; but as they mature the hyperactive characteristics decrease and the once distracting behaviors become purposeful (Montano, 2004) and productive (Adler, 2004). This does not mean that prior reading, math or attention problems have diminished but that the individual has learned over the years to compensate for them and, therefore, no longer finds them as problematic. The high percent of scores greater than 55, which are indicative of significant ADD symptoms, may indicate that the Brown ADD Scales are either overly sensitive to these characteristics or that there is a greater potential for Adult ADD characteristics in the sample of students utilized in this study. The possibility of a greater potential for Adult ADD characteristics in this sample of college students than the estimated 4.7% in the adult population is given support by the survey, in which 12% of the respondents indicated that they were previously diagnosed with ADHD/ADD.

By utilizing a normal population to screen for Adult ADD characteristics, the frequency of significant and possibly severe Adult ADD symptoms that may contribute to academic and personal problems in the ODU student population was researched. The survey found that 12% of the respondents stated that they had been previously diagnosed with ADHD/ADD, which is well above the 'accepted' range in the adolescent population.

It is also higher than the estimated percentage of individuals whose childhood characteristics continue into adulthood, and even higher still than the limited few that are able to attend college because of ADD characteristics' association with academic problems. Few studies have screened normal college populations, and none have found or suspected that students could be diagnosed with ADHD/ADD to this extent at the post-secondary education level. Through the use of the Brown Adult ADD Scales Ready Score Answer Document as a screening tool, 25% of the respondents self-reported significant Adult ADD characteristics. These scores were not used to predict estimates of ADD in the student population but were used to determine if there was a relationship between these characteristics and another screening tool, the ODU Freshman Survey Probation Score, which is used to predict which freshmen may have academic difficulty completing their first year of college and be placed on academic probation. Those freshmen that are identified as at risk for academic difficulty (less than a 2.0 GPA after the first semester of college) by the Probation Score are referred to a specialized program to assist them in completing their college education. If the Brown Adult ADD Scales Score reflects a significant relationship, then those students who are at risk may be considered for a clinical evaluation for Adult ADD and any co-occurring disability as part of their specialized program. Treatment for Adult ADD and any co-occurring disorder could improve the students' ability to address their academic problems and their chances to complete the first year of college, as well as to obtain a degree. Therefore, those students identified with a high probation score and a significant Adult ADD score could benefit from a clinical evaluation for Adult ADD and co-occurring disorders, which includes learning disabilities. Scores greater than 55 on the Brown Adult ADD Scales by themselves do not indicate an



ADD diagnosis, but the fact that this survey also shows a statistically significant relationship between ADD scores and the Freshman Survey Probation Score indicates that a clinical evaluation needs to be considered to assist in improving student retention and decreasing academic probation.

## LIMITATIONS

The Brown Adult ADD Scales Ready Score Survey is not intended to be 'the diagnostic tool' but rather one of several available tools that can be utilized to screen for, as well as treat, Adult ADD symptoms. For this research, the survey was used to document and measure the severity of self-reported Adult ADD symptoms. Though the sensitivity of the Brown Adult ADD Scales may be questioned, due to 25% of the respondents self-reporting significant symptoms, however, having 12% of the respondents also state that they were previously diagnosed with ADHD/ADD strongly suggests that the various ranges of children diagnosed with ADHD/ADD, such as 2 - 7% (Hervey, Epstein, & Curry, 2004), 3 - 5% (Frazier, Demaree, & Youngstrom, 2004), and 4 - 12% (Weiss & Weiss, 2004), which were all based on estimations over 10 years earlier, are low compared to the freshman and sophomore population. The estimates for individuals diagnosed with ADD are lower for the adult population, 4.7% (Weiss & Weiss), and even lower for those individuals that have made it to the college level, 1 - 3% (Javorsky & Gussin, 1994), due to the relationship ADD has with academic impairment. Gender issues may cause the discrepancy between the self-reported significant Adult ADD characteristics at ODU, as compared to the estimates in the adolescent, adult, and college level population. Girls are less likely than boys to exhibit conduct disorder symptoms, which are often the reason for clinical referral (Faraone, et al., 2000). This is reflected in the male to

female ADHD diagnosis ratio for adolescents of 3:1, clinically referred of 10:1, and adults of 3:2, when women take it upon themselves to self-refer (Biederman, 2004).

Two limitations in this study that have not been addressed in previous research is whether or not any benefit can be contributed to individuals with Adult ADD characteristics or if all ADD characteristics can be categorized as problem behavior. The research in this study focused on Adult ADD characteristics as problems. This single limitation has an impact on each hypothesis stated in this research, due to the design of the research that utilized a normal population to screen for ADD characteristics rather than draw from a population that already had a defined problem, such as students seeking assistance for academic or personal problems from a college counseling center. This may account for the high percentage of Adult ADD characteristics (25%) found through the Brown Adult ADD Self-report Survey. It may also account for the 'mixed' results in Hypothesis 2 and Hypothesis 3, which found only a low relationship between the Brown Adult ADD Scales Total Score and Fall 2004 GPA, even though a relationship was previously reported (Heiligenstein, Guenther, Levy, Savino, & Fulwiler, 1999), utilizing the same Brown Adult Rating Scales. Not every student that has Adult ADD characteristics obtains poor grades, but rather students who were previously diagnosed with Adult ADD have lower grade point averages and more academic problems and are more likely to be on academic probation. The research also did not take into account that not all academic problems are due to Adult ADD characteristics; poor grades can be attributed to numerous factors. An additional limitation that may also contribute to the mixed results is that prior research has suggested that Adult ADD characteristics alone may not account for all the academic problems observed in students diagnosed with Adult

ADD but rather the often co-occurring learning disabilities that place even greater risks for school failure upon the student (Seidman, Biederman, Monteaux, Doyle, & Faraone, 2001).

Sampling a normal population of students also may have contributed in Hypothesis 4 to finding not an overrepresentation of minority college students with higher Brown Adult ADD Scales scores but a lower pattern, as compared to their European-American counterparts. This may reflect the current research, which shows that minority primary and secondary students are not treated clinically for ADD symptoms at the same frequency as European-American children and adolescents and, therefore, are unable to overcome their academic difficulties and obtain a post-secondary education (Kendall & Hatton, 2002). Rather than presenting at the college level at a greater frequency of significant untreated clinical Adult ADD symptoms, as compared to the European-American student who was more likely to be treated for their clinical Adult ADD symptoms as hypothesized, the minority secondary school student was unable to or did not pursue post secondary education. Therefore, it is possible that fewer minority students with ADD characteristics attend college.

## DISCUSSION

This research has demonstrated the relationship between Adult ADD characteristics and potential academically at risk college students that have been identified through the Freshman Survey Probation Score. At a time when colleges are attempting to identify barriers that prevent students from completing a degree, it is extremely important that, now, one of these barriers has been identified, and what is even more important is that there is a solution to the problem. Adult ADD characteristics are a barrier to

completing a college degree, and prescreening and clinical intervention for Adult ADD characteristics is the solution. In 2001, ODU developed four goals in order to improve the six-year graduation rate that was unacceptably low at 33%, as compared to 42% of its peer group average. The goals were to 1) raise the admission standards, 2) recruit more academically talented first-year students, 3) increase the emphasis on academic performance in the first-year orientation programs, and 4) develop a series of interventions for at risk students (W.H. Graves, letter, August 29, 2001). The screening of Adult ADD characteristics for identified at risk students would greatly support these goals and strengthen the currently developed intervention program for academically at risk students. Current interventions for students with academic difficulties could be contra-indicated for college students with ADD, due to the unique way they may perceive and process information. Students with ADD would benefit from interventions and support systems that are different for students that do not have significant ADD characteristics. Students with ADD are at risk for co-occurring mental health disorders and learning disabilities, which are major contributors to their academic difficulties; therefore, student counseling centers need to be aware of co-occurring disorders. Students that are at risk for academic difficulties and have significant ADD characteristics need to be evaluated for learning disabilities, especially for reading and math. By being pro-active and linking these students to intervention programs and counseling services prior to serious problems occurring, the college would improve its graduation rate, as well as the academic performance of its student population. These services and interventions would also support the number one strategic goal for the Old Dominion University Strategic Plan 2005-2009, which is to increase undergraduate and graduate academic quality. The intervention program would

also support the second strategic goal, which is to create an agenda and climate that encourages research. Childhood and adolescent ADHD is probably one of the most researched disorders, while Adult ADD is only now being recognized as a valid disorder, and its impact on college students is still not understood. Utilizing the Brown Adult ADD Scales as a screening tool, the Freshmen Orientation Program provides an opportunity to establish research for the occurrence of ADD characteristics in the college student population, as well as its influence on, impact on, and relationship to academic difficulties as measured by student retention rates and GPA scores. Both of these issues are of great concern and interest to colleges. Some colleges already have developed and initiated specialized programs for students who have significant Adult ADD characteristics. Purdue University developed the Adaptive Programs, which are designed to provide students with disabilities the opportunity to pursue and obtain their intellectual goals and to provide accommodations to students diagnosed with ADHD. Landmark College is a two-year college specifically designed to work with students with ADHD to develop their academic skills, which will allow them to adjust and succeed in four-year college programs. Incorporating screening and intervention programs for students with Adult ADD characteristics into ODU's current intervention program for at risk students would allow students to achieve their full academic potential. To help meet the goals of increased academic quality and performance, encouragement for research, and strengthening of first-year orientation programs, five initiatives need to be developed. First, screening of incoming freshmen for Adult ADD characteristics, utilizing the Brown Adult ADD Scales, can be accomplished through the Freshmen Orientation Program. This would encourage research into the awareness and extent of ADHD/ADD in the college student population,

as well as the relationship between Adult ADD characteristics and academically at risk students. This research has demonstrated the relationship between Adult ADD characteristics and Freshmen Survey Probation Score, but further research needs to develop its relationship to academic achievement as measured by GPA and graduation rate. Second, students who had been screened and identified with significant Adult ADD characteristics and are on academic probation need to be referred for a clinical evaluation for Adult ADD. The relationship between Adult ADD and academic achievement as measured by GPA is still unknown and would benefit from further research. Students who have significant Adult ADD characteristics but are academically not at risk and do not have any related problems do not need a clinical evaluation. A diagnosis of ADD requires problems related to the symptoms of ADD, and characteristics alone do not qualify for an ADD diagnosis. Individuals with Adult ADD characteristics often benefit and excel, so the symptoms themselves may not be a problem for the student. Third, students diagnosed with Adult ADD should be referred for an evaluation for learning disabilities (LD). Depending on the criteria used, between 10 - 80% of individuals with ADD also have a co-occurring LD. Adult ADD and LD are two distinct conditions but often co-exist, creating confusion for a reliable diagnosis and appropriate treatment. This area would also benefit from further research involving Adult ADD and co-occurring LD. Fourth, student counseling centers need to become aware that, often, individuals are seeking assistance for problems that are not usually attributed to ADD because of the perception that ADD is of low occurrence in the student population and need to consider Adult ADD as the possible primary issue. Research has shown that problems associated with ADD are often the reason for seeking assistance at student counseling centers. For some students, Adult

ADD characteristics may not become a significant problem until they are confronted by the additional stresses of college life and are without the immediate support of their families. Individuals that are referred for Adult ADD evaluation also need to be evaluated for co-occurring mental health disorders, due to approximately 50% of individuals with Adult ADD having a co-occurring disorder, which includes LD. Fifth, students already diagnosed with Adult ADD need clinical support and college accommodations that are required by federal law. The at risk program and a student counseling center focused on Adult ADD clinical treatment can be utilized to ensure that students achieve their highest academic goals.

#### RECOMMENDATIONS

1. Recommend that the Brown Adult ADD Scales be utilized to screen students who are at risk for academic probation for significant Adult ADD characteristics. Early identification of significant Adult ADD characteristics needs to be combined with intervention strategies for academically at risk students to determine if there is improvement to students' academic performance and retention. Are there significant differences in Adult ADD characteristics between those students who remain in school and those who drop out?
2. Recommend students who are on academic probation and have significant Adult ADD characteristics be clinically evaluated for Adult ADD and co-occurring disorders that include LD. Are their co-occurring disorders more common or significant than others? What is the treatment history of those previously identified with ADHD/ADD, such as with medication or

psychotherapy? Are there Brown Adult ADD Scales associated with different co-occurring disorders?

3. Recommend students who have been identified with LD be screened for Adult ADD characteristics for possible clinical evaluation for Adult ADD. What is the co-occurring frequency of LD with Adult ADD? Are there differences between LD and LD with Adult ADD?
4. Recommend students who present themselves or are referred to the student counseling center be evaluated for possible Adult ADD symptoms impacting the reason for their visit. Resources need to be identified and developed in order to adopt a proactive approach for intervention with students whose Adult ADD symptoms negatively impact their lives. Are there Adult ADD characteristics from which students benefit in using? Are there psychotherapy and medication treatments available for those individuals diagnosed with Adult ADD or with co-occurring disorders? What are the responses to treatment as measured through GPA and retention rate?
5. Recommend further research on students on academic probation and its relationship to GPA and Adult ADD characteristics. Do students with significant Adult ADD characteristics have lower a GPA than students with fewer Adult ADD characteristics? Are there Brown Adult ADD Sub-scales that are associated with academic difficulties?
6. Recommend further research on normal populations of students to determine the complexities, distribution, and extent of Adult ADD for the purpose of providing support and counseling services. Why do minority students self-



identify fewer Adult ADD characteristics than European-American students?

Do female students with significant Adult ADD characteristics score differently on the Brown Adult ADD Sub-scales, as compared to male students with significant Adult ADD characteristics?

## CONCLUSIONS

One of the primary intentions of this research dissertation was to bring to light the true significance of ADD characteristics, specifically in the adult population. The concept for this idea was developed during clinical reviews of adolescent and adult in-patient treatments at mental health facilities. Approximately 50% of children and adolescent psychological hospitalizations involved the diagnosis of ADHD, yet not a single adult hospitalization even mentioned the condition. It was difficult to understand how ADHD symptoms simply disappeared or were no longer clinically significant after the age of 18. Curiosity and personal research led to a conclusion different from that held by numerous clinicians and mental health providers.

Adult ADD characteristics are not necessarily problem behaviors but may cause problems for the individual and need to be evaluated on an individual, case-by-case basis. The results of this research may not be adequate to redefine Adult ADD in the college population, but this research does demonstrate that Adult ADD characteristics are a significant factor in the academically at risk population and need to be part of the evaluation process for students identified as at risk for academic difficulty. Therefore, due to the fact that college students with significant Adult ADD characteristics process and respond to information differently than college students with non-significant Adult ADD

characteristics, counseling for academically at risk students needs to include specifically designed programs for students with significant Adult ADD characteristics.

## REFERENCES

- Adler, L. A. (2004). Clinical presentations of adult patients with ADHD. *Journal of Clinical Psychiatry*, 65(Suppl. 3), 8-11.
- Amen, D. G. (2001). *Healing ADD: The breakthrough program that allows you to see and heal the six types of attention deficit disorder*. New York: G. P. Putnam's Sons.
- American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3<sup>rd</sup> ed.) Washington, DC: Author.
- American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3<sup>rd</sup> ed.- revised). Washington, DC: Author.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4<sup>th</sup> ed.). Washington DC: Author.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4<sup>th</sup> ed. text revised). Washington, DC: Author.
- Applegate, B., Lahey, B. B., Hart, E. L., Biederman, J., Hynd, G. W., Barkley, R. A., et al. (1997). Validity of the age-of-onset criteria for ADHD: A report from the DSM-IV field trials. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 1211-1221.
- Ary, D., Jacobs, L.C., & Razavieh, A. (1996). *Introduction to research in education* (5<sup>th</sup> ed.). Fort Worth: Harcourt Brace College Publishers.
- Astin, A. W. (1975). *Preventing students from dropping out*. San Francisco: Jossey-Bass Publishers.
- Attention Deficit & Hyperactive Disorder. (2002). Retrieved December 1, 2002, from <http://www.purdue.edu/odos/adpro/add.htm>
- Attention Deficit Hyperactivity Disorder in Adults. (1994). *The American Journal of Psychiatry*, 151, 633-638.

- Aviram, R. B., Rhum, M., & Levin, F. R. (2001). Psychotherapy of adults with comorbid attention-deficit/hyperactivity disorder and psychoactive substance use disorder. *Journal of Psychotherapy Practice and Research*, 10, 179-186.
- Barkley, R. A. (1990). *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment*. New York: The Guilford Press.
- Barkley, R. A. (1998). *Attention deficit hyperactivity disorder: A handbook for diagnosis and treatment*. 2<sup>nd</sup> ed. New York: The Guilford Press.
- Barkley, R. A. (2000). *Taking charge of ADHD: The complete, authoritative guide for parents*. New York: The Guilford Press.
- Barkley, R. A., & Biederman, J. (1997). Toward a broader definition of the age-of-onset criterion for attention-deficit hyperactivity disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 1204-1210.
- Biederman, J. (2004). Impact of comorbidity in adults with attention-deficit/hyperactivity disorder. *Journal of Clinical Psychiatry*, 65(Suppl. 3), 3-7.
- Biederman, J., & Faraone, S. V. (2004). Attention deficit hyperactivity disorder: A worldwide concern. *Journal of Nervous and Mental Disease*, 192, 453-454.
- Biederman, J., Faraone, S. V., Keenan, K., Benjamin, J., Krifcher, B., Moore, C., et al. (1992). Further evidence for family-genetic risk factors in attention deficit hyperactivity disorder: Patterns of comorbidity in probands and relatives in psychiatrically and pediatrically referred samples. *Archives of General Psychiatry*, 49, 728-738.
- Biederman, J., Faraone, S. V., Keenan, K., Knee, D., & Tsuang, M. T. (1990). Family-genetic and psychological risk factors in DSM III attention deficit disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, 29, 526-533.

- Biederman, J., Faraone, S. V., Knee, D., & Munir, K. (1990). Retrospective assessment of DSM-III attention deficit disorder in non-referred individuals. *Journal of Clinical Psychiatry*, 51, 102-106.
- Biederman, J., Faraone, S. V., Mick, E., Spencer, T., Wilens, T., Kiely, K., et al. (1995). High risk for attention deficit hyperactivity disorder among children of parents with childhood onset of the disorder: A pilot study. *The American Journal of Psychiatry*, 152, 431-435.
- Biederman, J., Faraone, S. V., & Monuteaux, M. C. (2002). Differential effect of environmental adversity by gender: Rutter's index of adversity in a group of boys and girls with and without ADHD. *The American Journal of Psychiatry*, 159, 1556-1562.
- Biederman, J., Faraone, S. V., Monuteaux, M. C., Bober, M., & Cadogan, E. (2004). Gender effects on attention-deficit/hyperactivity disorder in adults, revisited. *Biological Psychiatry*, 55, 692-700.
- Biederman, J., Faraone, S. V., Monuteaux, M. C., Plunkett, E. A., Gifford, J., & Spencer, T. (2003). Growth deficits and attention-deficit/hyperactivity disorder revisited: Impact of gender, development, and treatment. *Pediatrics*, 111, 1010-1016.
- Biederman, J., Faraone, S. V., Spencer, T., Wilens, T., Norman, D., Lapey, K., et al. (1993). Patterns of psychiatric comorbidity, cognition, and psychosocial functioning in adults with attention deficit hyperactivity disorder. *The American Journal of Psychiatry*, 150, 1792-1798.
- Biederman, J., Mick, E., & Faraone, S. (2000). Age-dependent decline of symptoms of attention deficit disorder: Impact of remission definition and symptom type. *The American Journal of Psychiatry*, 157, 816-818.
- Biederman, J., Mick, E., Faraone, S. V., Braaten, E., Doyle, A., Spencer, T., et al. (2002). Influence of gender on attention deficit hyperactivity disorder in children referred to a psychiatric clinic. *The American Journal of Psychiatry*, 159, 36-42.

- Biederman, J., Milberger, S., Faraone, S. V., Kiely, K., Guite, J., Mick, E., et al. (1995). Impact of adversity on function and comorbidity in children with attention-deficit hyperactivity disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, 34, 1495-1503.
- Biederman, J., Newcorn, J., & Sprich, S. (1991). Comorbidity of attention deficit hyperactivity disorder with conduct, depressive, anxiety, and other disorders. *The American Journal of Psychiatry*, 148, 564-576.
- Biederman, J., Wilens, T., Mick, E., Milberger, S., Spencer, T., & Faraone, S. V. (1995). Psychoactive substance use disorders in adults with attention deficit hyperactive disorder (ADHD): Effects of ADHD and psychiatric comorbidity. *The American Journal of Psychiatry*, 152, 1652-1658.
- Bishop, J. B., Bauer, K. W., & Becker, E. T. (1998). A survey of counseling needs of male and female college students. *Journal of College Student Development*, 39, 205-210.
- Blackorby, J., & Wagner, M. (1996). Longitudinal postschool outcomes of youth with disabilities: Findings from the national longitudinal transition study. *Exceptional Children*, 62, 399-413.
- Boudreau, C. A., & Kromrey, J. D. (1994). A longitudinal study of the retention and academic performance of participants in freshman orientation course. *Journal of College Student Development*, 35, 444-449.
- Bramer, J. S. (1996). *Succeeding in college with attention deficit disorders: Issues & strategies for students, counselors, & educators*. Plantation, Florida: Specialty Press, Inc.
- Brown Attention-Deficit Disorder Scales. (2001). In B. S. Plake & J. C. Impara (Eds.), *The Fourteenth Mental Measurements Yearbook* (pp.183-190). Lincoln, NE: The University of Nebraska Press.

- Brown, T. E. (1996). *Brown attention-deficit disorder-manual*. San Antonio: The Psychological Corporation.
- Brown, T. E. (2000). *Attention-deficit disorders and comorbidities in children, adolescents, and adults*. Washington, DC: American Psychiatric Press, Inc.
- Burt, S. A., Krueger, R. F., McGue, M., & Iacono, W. G. (2001). Sources of covariation among attention-deficit/hyperactivity disorder, oppositional defiant disorder, and conduct disorder: The importance of shared environment. *Journal of Abnormal Psychology*, 110, 516-525.
- Bussing, R., Schoenberg, N. E., & Perwien, A. R. (1998). Knowledge and information about ADHD: Evidence of cultural differences among African American and white parents. *Social Science Medical*, 46, 919-928.
- Bussing, R., Schoenberg, N. E., Rogers, K. M., Zima, B. T., & Angus, S. (1998). Explanatory models of ADHD: Do they differ by ethnicity, child gender, or treatment status. *Journal of Emotional and Behavioral Disorders*, 6, 233-242.
- Bussing, R., Zima, B. T., & Belin, T. R. (1998). Differential access to care for children with ADHD in special education programs. *Psychiatric Services*, 1226-1229.
- Bussing, R., Zima, B. T., Belin, T. R., & Forness, S. R. (1998). Children who qualify for LD and SED programs: Do they differ in level of ADHD symptoms and comorbid psychiatric conditions? *Behavioral Disorders*, 23, 85-97.
- Bussing, R., Zima, B. T., Perwien, A. R., Belin, T. R., & Widawski, M. (1998). Children in special education programs: Attention deficit hyperactivity disorder, use of services, and unmet needs. *American Journal of Public Health*, 88, 880-886.
- Calliotte, J. A., Pickering, J. W., & McAuliffe, G. J. (1994). *Treating freshman identified with noncognitive predictors of academic difficulty and attrition*. Manuscript submitted for publication.

- Carlton, P. L., Manowitz, P., McBride, H., Nora, R., Swartzburg, M., & Goldstein, L. (1987). Attention deficit disorder and pathological gambling. *Journal of Clinical Psychiatry*, 48, 487-488.
- Coleman, H. L., & Freedman, A. M. (1996). Effects of a structured group intervention on the achievement of academically at-risk undergraduates. *Journal of College Student Development*, 37, 631-636.
- Conners, C.K., Erhardt, D., Epstein, J.N., Parker, J. D., Sitarenios, G., & Sparrow, E. (1999). Self-ratings of ADHD symptoms in adults I: Factor structure and normative data. *Journal of Attention Disorders*, 3, 141-151.
- Coutinho, M. J., & Oswald, D. P. (1998). Ethnicity and special education research: Identifying questions and methods. *Behavioral Disorders*, 24, 66-73.
- Delphin, M. E., & Rollock, D. (1995). University alienation and African American ethnic identity as predictors of attitudes toward, knowledge about, and likely use of psychological services. *Journal of College Student Development*, 36, 337-346.
- Denckla, M. B. (2000). Learning disabilities and attention-deficit/hyperactivity disorder in adults: Overlap with executive dysfunction. In T. E. Brown. (Eds.) *Attention deficit disorders and comorbidities in children, adolescents, and adults* (pp. 297-318). Washington DC: American Psychiatric Press, Inc.
- Disney, E. R., Elkins, I. J., McGue, M., & Iacono, W. G. (1999). Effects of ADHD, conduct disorder, and gender on substance use and abuse in adolescents. *The American Journal of Psychiatry*, 156, 1515-1521.
- Dominguez de Ramirez, R., & Shapiro, E. S. (1998). Teacher ratings of attention deficit hyperactivity disorder symptoms in Hispanic children. *Journal of Psychological and Behavioral Assessment*, 20, 275-293.
- Downey, K., Stelson, F., Pomerleau, O., & Giordani, B. (1997). Adult attention deficit hyperactivity disorder: Psychological test profiles in a clinical population. *Journal of Nervous and Mental Disease*, 185, 32-38.



- Doyle, A. E., Faraone, S. V., DuPre, E. P., & Biederman, J. (2001). Separating attention deficit hyperactivity disorder and learning disabilities in girls: A familial risk analysis. *American Journal of Psychiatry*, 158, 1666-1672.
- Dunn, C. (1995). A comparison of three groups of academically at-risk college students. *Journal of College Student Development*, 36, 270-279.
- DuPaul, G. J., Schaughency, E. A., Weyandt, L. L., Tripp, G., Kiesner, J., Ota, K., et al. (2001). Self-report of ADHD symptoms in university students: Cross-gender and cross-national prevalence. *Journal of Learning Disabilities*, 34, 370-379.
- Erhardt, D., Epstein, J. N., Conners, C. K., Parker, J. D., & Sitarenios, G. (1999). Self-ratings of ADHD symptoms in adults II: Reliability, validity, and diagnostic sensitivity. *Journal of Attention Disorders*, 3, 153-158.
- Faigel, H. (1995). Attention deficit disorder in college students: Facts, fallacies, and treatment. *Journal of American College Health*, 43, 147-155.
- Faraone, S. V., Biederman, J., Lehman, B. K., Keenan, K., Norman, D., Seidman, L., et al. (1993). Evidence for the independent familial transmission of attention deficit hyperactivity disorder and learning disabilities: Results from a family genetic study. *The American Journal of Psychiatry*, 150, 891-895.
- Faraone, S. V., Biederman, J., Mick, E., Williamson, S., Wilens, T., Spencer, T., et al. (2000). Family study of girls with attention deficit hyperactivity disorder. *The American Journal of Psychiatry*, 157, 1077-1083.
- Faraone, S., Biederman, J., Monuteaux, M., & Seidman, L. (2001). A psychometric measure of learning disability predicts educational failure four years later in boys with attention-deficit/hyperactivity disorder. *Journal of Attention Disorders*, 4, 220-230.
- Faraone, S. V., Biederman, J., Spencer, T., Wilens, T., Seidman, L. J., Mick, E., et al. (2000). Attention-deficit/hyperactivity disorder in adults: An overview. *Biological Psychiatry*, 48, 9-20.

- Faraone, S. V., Biederman, J., Weiffenbach, B., Keith, T., Chu, M. P., Weaver, A., et al. (1999). Dopamine D4 gene 7-repeat allele and attention deficit hyperactivity disorder. *The American Journal of Psychiatry*, 156, 768-770.
- Feenstra, J. S., Banyard, V. L., Rines, E. N., & Hopkins, K. R. (2001). First-year students' adaptation to college: The role of family variables and individual coping. *Journal of College Development*, 42, 106-114.
- Fidler, P. P., & Hunter, M. S. (1989). How seminars enhance student success. In Upcraft, M. L. & Gardner, J. N. (Eds.), *The freshman year experience* (pp. 216-237). San Francisco, CA: Jossey-Bass.
- Frazier, T. W., Demaree, H. A., & Youngstrom, E. A. (2004). Meta-analysis of intellectual and neuropsychological test performance in attention-deficit/hyperactivity disorder. *Neuropsychology*, 18, 543-555.
- Gaub, M., & Carlson, C. L. (1997). Gender differences in ADHD: A meta-analysis and critical review. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 1036-1045.
- Gay, L. R., & Airasian, P. (2000). *Educational research: Competencies for analysis and application* (6<sup>th</sup> ed.). Upper Saddle River, New Jersey: Merrill.
- Gittelman, R., Mannuzza, S., Shenker, R., & Bonagura, N. (1985). Hyperactive boys grown up: I. psychiatric status. *Archives of General Psychiatry*, 42, 937-947.
- Gordon, V. N. (1989). Origins and purpose of the freshman seminar. In Upcraft, M. L. & Garner, J. N. (Eds.), *The freshman year experience* (pp. 183-197). San Francisco, CA: Jossey-Bass.
- Grenwald-Mayes, G. (2002). Relationship between current quality of life and family of origin dynamics for college students with attention-deficit/hyperactivity disorder. *Journal of Attention Disorders*, 5, 211-221.

- Hallowell, E. M., & Ratey, J. J. (1994). *Driven to distraction: Recognizing and coping with attention deficit disorder from childhood through adulthood*. New York: Simon & Schuster.
- Hartmann, T. (1995). *ADD success stories: A guide to fulfillment for families with attention deficit disorder*. Grass Valley, California: Underwood Books.
- Hechtman, L., Weiss, G., Perlman, T., & Amsel, R. (1984). Hyperactives as young adults: Initial predictors of adult outcome. *Journal of the American Academy of Child Psychiatry*, 23, 250-260.
- Heiligenstein, E., Conyers, L., Berns, A., & Smith, M. (1998). Preliminary normative data on DSM-IV attention deficit hyperactive disorder in college students. *Journal of American College Health*, 46, 185-188.
- Heiligenstein, E., Guenther, G., Levy, A., Savino, F., & Fulwiler, J. (1999). Psychological and academic functioning in college students with attention deficit hyperactivity disorder. *Journal of American Health*, 47, 181-185.
- Heiligenstein, E., & Keeling, R. (1995). Presentation of unrecognized attention deficit hyperactivity disorder in college students. *Journal of American College Health*, 43, 226-228.
- Heppner, P. P., Kivlighan, D. M., Good, G. E., Roehlke, H. J., Hills, H. I., & Ashby, J. S. (1994). Presenting problems of university counseling center clients: A snapshot and multivariate classification scheme. *Journal of Counseling Psychology*, 41, 315-324.
- Hervey, A. S., Epstein, J. N., & Curry, J. F. (2004). Neuropsychology of adults with attention-deficit/hyperactivity disorder: A meta-analytic review. *Neuropsychology*, 18, 485-503.
- Hill, J. C., & Schoener, E. P. (1996). Age-dependent decline of attention deficit hyperactivity disorder. *The American Journal of Psychiatry*, 153, 1143-1146.

- Howard, H. E., & Jones, W. P. (1997). Effectiveness of a freshman seminar in an urban university: Measurement of selected indicators. *College Student Journal*, 509-515.
- Hudziak, J. J. (2000). Genetics of attention-deficit/hyperactivity disorder. In T. E. Brown. (Eds.) *Attention deficit disorders and comorbidities in children, adolescents, and adults* (pp. 57-78). Washington DC: American Psychiatric Press, Inc.
- Ingersoll, B. D., & Goldstein, S. (1993). *Attention deficit disorder and learning disabilities: Realities, myths and controversial treatments*. New York: Doubleday.
- Javorsky, J., & Gussin, B. (1994). College students with attention deficit hyperactivity disorder: An overview and description of services. *Journal of College Student Development*, 35, 170-176.
- Jensen, P. S., Shervette, R. E., Xenakis, S. N., & Richters, J. (1993). Anxiety and depressive disorders in attention deficit disorder with hyperactivity: New findings. *The American Journal of Psychiatry*, 150, 1203-1209.
- Johnson, J. L. (1997). Commuter college students: What factors determine who will persist and who will drop out? *College Student Journal*, 323-332.
- Johnson, D. R., Stodden, R. A., Emanuel, E. J., Luecking, R., & Mack, M. (2002). Current challenges facing secondary education and transition services: What research tells us. *Exceptional Children*, 68, 519-531.
- Kafka, M. P., & Prentky, R. A. (1998). Attention-deficit/hyperactivity disorder in males with paraphilias and paraphilia-related disorders: A comorbidity study. *Journal of Clinical Psychiatry*, 59, 388-396.
- Kato, P. M., Nichols, M. L., Kerivan, A. S., & Huffman, L. C. (2001). Identifying characteristics of older and younger females with attention-deficit hyperactivity disorder. *Journal of Developmental & Behavioral Pediatrics*, 22, 306-315.

- Kendall, J., & Hatton, D. (2002). Racism as a source of health disparity in families with children with attention deficit hyperactivity disorder. *Advances in Nursing Science*, 25, 22-39.
- Kendall, J., Hatton, D., Beckett, A., & Leo, M. (2003). Children's accounts of attention-deficit/hyperactivity disorder. *Advances in Nursing Science*, 26, 114-130.
- Knab, J., Cashman, J., & Sullivan, M. (2000). Choosing options for success: A student's guide to admissions, support, and counseling. In Taymans, J. M., West, L. L., & Sullivan, M. (Eds.), *Unlocking potential: College and other choices for people with LD and AD/HD* (pp. 153-197). Maryland: Woodbine House.
- Klein, R. G., & Mannuzza, S. (1989). The long term outcome of the attention deficit disorder/hyperkinetic syndrome. In T. Savolden & T. Archer (Eds.), *Attention Deficit Disorder Clinical and Basic Research* (pp 71-91). Hillsdale, NJ: Erlbaum.
- Landmark College. (2003). Retrieved January 21, 2003, from <http://www.landmarkcollege.org>
- Latham, P. H. (1995). Legal issues pertaining to the postsecondary student with ADD. *Journal on Postsecondary Education and Disability*, 11, 53-61.
- Lore, C. J. (1997). Student mental health and funding constraints: A delicate balance. *Journal of American College Health*, 46, 43-46.
- Mannuzza, S., Klein, R. G., Bessler, A., Malloy, P., & Hynes, M. E. (1997). Educational and occupational outcome of hyperactive boys grown up. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 1222-1227.
- Mannuzza, S., Klein, R. G., Bessler, A., Malloy, P., & LaPadula, M. (1998). Adult psychiatric status of hyperactive boys grown up. *The American Journal of Psychiatry*, 155, 4.
- Mannuzza, S., Klein, R. G., Klein, D. F., Bessler, A., & Shrout, P. (2002). Accuracy of adult recall of childhood attention deficit hyperactivity disorder. *The American Journal of Psychiatry*, 159, 1882-1888.

- Marshall, R. M., Hynd, G. W., Handwerk, M. J., & Hall, J. (1997). Academic underachievement in ADHD subtypes. *Journal of Learning Disabilities*, 30, 635-642.
- Mathis, M., & Lecci, L. (1999). Hardiness and college adjustment: Identifying students in need of services. *Journal of College Student Development*, 40, 305-309.
- Mayes, S., Calhoun, S., & Crowell, E. (2000). Learning disabilities and ADHD: Overlapping spectrum disorders. *Journal of Learning Disabilities*, 33, 417-424.
- McGough, J. J., & Barkley, R. A. (2004). Diagnostic controversies in adult attention deficit hyperactivity disorder. *The American Journal of Psychiatry*, 161, 1948-1956.
- Milberger, S., Biederman, J., Faraone, S. V., Chen, L., & Jones, J. (1996). Is smoking during pregnancy a risk factor for attention deficit hyperactivity disorder in children? *The American Journal of Psychiatry*, 153, 1138-1142.
- Milberger, S., Biederman, J., Faraone, S. V., Murphy, J., & Tsuang, M. T. (1995). Attention deficit hyperactivity disorder and comorbid disorders: Issues of overlapping symptoms. *The American Journal of Psychiatry*, 152, 1793-1800.
- Montano, B. (2004). Diagnosis and treatment of ADHD in adults in primary care. *Journal of Clinical Psychiatry*, 65(Suppl. 3), 18-21.
- Morgan, A. E., Hynd, G. W., Riccio, C. A., & Hall, J. (1996). Validity of DSM-IV ADHD predominantly inattentive and combined types: Relationship to previously DSM diagnoses/subtypes differences. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35, 325-333.
- Murphy, K. R., & Adler, L. A. (2004). Assessing attention-deficit/hyperactivity disorder in adults: Focus on rating scales. *Journal of Clinical Psychiatry*, 65(Suppl. 3), 12-17.
- Murphy, P. (2002). Cognitive functioning in adults with attention-deficit/hyperactivity disorder. *Journal of Attention Disorders*, 5, 203-209.

- Murphy, P., & Schachar, R. (2000). Use of self-ratings in the assessment of symptoms of attention deficit hyperactivity disorder in adults. *The American Journal of Psychiatry*, 157, 1156-1159.
- National Center for Education Statistics (1999). *Students with disabilities in postsecondary education: A profile of preparation, participation, and outcomes*. Washington, DC: U.S. Department of Education.
- Oswald, D. P., Coutinho, M. J., Best, A. M., & Singh, N. N. (1999). Ethnic representation in special education: The influence of school-related economic and demographic variables. *The Journal of Special Education*, 32, 194-206.
- Pascarella, E. T. (1984). College environmental influences on students' educational aspirations. *Journal of Higher Education*, 55, 751-771.
- Paul, E. L., & Brier, S. (2001). Friendsickness in the transition to college: Precollege predictors and college adjustment correlates. *Journal of Counseling & Development*, 79, 77-89.
- Pickering, J. W., & Calliotte, J. A. (1996). Using a survey to identify at-risk freshman. In T. W. Banta, J. P. Lund, K. E. Black, & F. W. Oblander (Eds.), *Assessment in practice: Putting principles to work on college campuses* (pp. 250-253). San Francisco, CA: Jossey-Bass Publishers.
- Pickering, W., & Calliotte, J. (2002). The Old Dominion University Freshman Survey: Identifying and intervening with, at-risk first-year students. Retrieved January 6, 2004 from <http://www.brevard.edu/fyc/ruproject/olddominionuniv/freshsurvey.htm>
- Pickering, W., & Calliotte, J. (2003). Development of the transitions to college and invitation to participate in pilot testing. Unpublished manuscript, Old Dominion University at Norfolk, VA.

- Pickering, J. W., & Calliotte, J. (2003). Using a freshman survey to identify and treat freshman at-risk for academic difficulty. Retrieved January 6, 2004 from <http://www.brevard.edu/fyc/ruproject/olddominionuniv/freshsurvey.htm>
- Pickering, J. W., Calliotte, J. A. & McAuliffe, G. J. (1992). The effect of noncognitive factors on freshman academic performance and retention. *Journal of the Freshman Year*, 4, 7-30.
- Pliska, S. R., Carlson, C. L., & Swanson, J. M. (1999). *ADHD with comorbid disorders: Clinical assessment and management*. New York: The Guilford Press.
- Quinn, P. (2001). *ADD and the college student: A guide for high school and college students with attention deficit disorder*. Washington: Magination Press.
- Rapport, M. D., Scanlan, S. W., & Denney, C. B. (1999). Attention-deficit/hyperactivity disorder and scholastic achievement: A model of dual development pathways. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 40, 1169-1183.
- Rashid, F. L., Morris, M. K., & Morris, R. (2001). Naming and verbal memory skills in adults with attention deficit hyperactivity disorder and reading disabilities. *Journal of Clinical Psychology*, 57, 829-838.
- Reid, R., Maag, J. W., & Vasa, S. F. (1994). Attention deficit hyperactivity disorder as a disability category: A critique. *Exceptional Children*, 60, 198-214.
- Resnick, R. (2000). *The Hidden Disorder: A clinicians guide to attention deficit hyperactivity disorder in adults*. Washington, DC: American Psychological Association.
- Richard, M. M. (1995). Pathways to success for the college student with ADD accommodations and preferred practices. *Journal on Postsecondary Education and Disability*, 11, 16-30.



- Richards, T., Rosen, L., & Ramirez, C. (1999). Psychological functioning differences among college students with confirmed ADHD, ADHD by self report only, and without ADHD. *Journal of College Student Development*, 40, 299-304.
- Robin, A. L. (1998). *ADHD in adolescents: Diagnosis and treatment*. New York: The Guilford Press.
- Roth, R. M., Wishart, H. A., Flashman, L. A., Riordan, H. J., Huey, L., & Saykin, A.J. (2004). Contribution of organizational strategy to verbal learning and memory in adults with attention-deficit/hyperactivity disorder. *Neuropsychology*, 18, 78-84.
- Rucklidge, J., & Tannock, R. (2002). Validity of the Brown ADD scales: An investigation in a predominantly inattentive ADHD adolescent sample with and without reading disabilities. *Journal of Attention Disorders*, 5, 155-163.
- Salus, V., & Bello, D. (2000). Learning disabilities: What are they? In Taymans, J. M., West, L. L., & Sullivan, M. (Eds.), *Unlocking potential: College and other choices for people with LD and AD/HD* (pp. 1-23). Maryland: Woodbine House.
- Samuel, V. J., Biederman, J., Faraone, S. V., George, P., Mick, E., Thornell, A., et al. (1998). Clinical characteristics of attention deficit hyperactivity disorder in African American children. *The American Journal of Psychiatry*, 155, 696-698.
- Samuel, V. J., Curtis, S., Thornell, A., George, P., Taylor, A., Ridley, D., et al. (1997). The unexplored void of ADHD and African-American research: A review of the literature. *Journal of Attention Disorders*, 1, 197-207.
- Scanlon, D., & Mellard, D. F. (2001). Academic and participation profiles of school-age dropouts with and without disabilities. *Exceptional Children*, 68, 239-258.
- Schubiner, H., Tzelepis, A., Isaacson, J. H., Warbasse, L. H., Zacharek, M., & Musical, J. (1995). The dual diagnosis of attention-deficit/hyperactivity disorder and substance abuse: Case reports and literature review. *Journal of Clinical Psychiatry*, 56, 146-150.

- Schubiner, H., Tzelepis, A., Milberger, S., Lockhart, N., Kruger, M., Kelley, B. J., et al. (2000). Prevalence of attention-deficit/hyperactivity disorder and conduct disorder among substance abusers. *Journal of Clinical Psychiatry*, 61, 244-251.
- Schwitzer, A. M., Grogan, K., Kaddoura, K., & Ochoa, L. (1993). Effects of brief mandatory counseling on help-seeking and academic success among at-risk college students. *Journal of College Student Development*, 34, 401-405.
- Scott, S. S., & Gregg, N. (2000). Meeting the evolving education needs of faculty in providing access for college students with LD. *Journal of Learning Disabilities*, 33, 158-167.
- Seidman, L. J., Biederman, J., Faraone, S. V., Weber, W., Mennin, D., & Jones, J. (1997). A pilot study of neuropsychological function in girls with ADHD. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 366-373.
- Seidman, L. L., Biederman, J., Monuteaux, M. C., Doyle, A. E. & Faraone, S. V. (2001). Learning disabilities and executive dysfunction in boys with attention-deficit/hyperactivity disorder. *Neuropsychology*, 15, 544-556.
- Shaywitz, S. E., & Shaywitz, B. A. (1989). Critical issues in attention-deficit disorder. In T. Savgolden & T. Archer (Eds.), *Attention-deficit disorder: Critical issues and basic research* (pp. 53-70). Hillsdale, NJ: Erlbaum.
- Spencer, L. E., & Oatts, T. (1999). Conduct disorder vs. attention-deficit hyperactivity disorder: Diagnostic implication for African-American adolescent males. *Education*, 119, 514-518.
- Teeter, P. (1998). *Interventions for ADHD: Treatment in developmental context*. New York: The Guilford Press.
- Thombs, D. L. (1995). Problem behavior and academic achievement among first-semester college freshmen. *Journal of College Student Development*, 36, 280-288.

- Ting, S. R. (1997). Estimating academic success in the 1<sup>st</sup> year of college for specially admitted white students: A model combining cognitive and psychosocial predictors. *Journal of College Student Development*, 38, 401-409.
- Ting, S. R., & Robinson, T. L. (1998). First-year academic success: A prediction combining cognitive and psychosocial variables for Caucasian and African American students. *Journal of College Development*, 39, 599-610.
- Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research*, 45, 89-125.
- Tinto, V. (1982). Limits of theory and practice in student attrition. *Journal of Higher Education*, 53, 687-700.
- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition*. Chicago: The University of Chicago Press.
- Triolo, S. J. (1999). *Attention deficit hyperactivity disorder in adulthood: A practitioner's handbook*. Philadelphia, PA: Brunner/Mazel.
- Turner, A. L., & Berry, T., R. (2000). Counseling center contributions to student retention and graduation: A longitudinal assessment. *Journal of College Student Development*, 41, 627-636.
- Turnock, P., Rosen, L., & Kaminski, P. (1998) Differences in academic coping strategies of college students who self-report high and low symptoms of attention deficit hyperactivity disorder. *Journal of College Student Development*, 39, 484-493.
- Walker, A. J., Shores, E. A., Trollor, J. N., Lee, T., & Sachdev, P. S. (2000). Neuropsychological functioning in adults with attention deficit hyperactivity disorder. *Journal of Clinical and Experimental Neuropsychology*, 22, 115-124.
- Weiss, L. (1992). *Attention deficit disorder in adults: Practical help and understanding*. Dallas: Taylor Publishing Company.
- Weiss, G., & Hechtman, L. T. (1993). *Hyperactive children grown up: ADHD in children, adolescents, and adults*. New York: The Guilford Press.

- Weiss, G., Hechtman, L., Milroy, T., & Perlman, T. (1985). Psychiatric status of hyperactives as adults: A controlled prospective 15-year follow-up of 63 hyperactive children. *Journal of the American Academy of Child Psychiatry*, 24, 211-220.
- Weiss, M. D., & Weiss, J. R. (2004). A guide to the treatment of adults with ADHD. *Journal of Clinical Psychology*, 65(Suppl. 3), 27-37
- Wender, P. (1995). *Attention deficit hyperactivity disorder in adults*. New York: Oxford University Press.
- Weyandt, L. L., Linterman, I., & Rice, J. A. (1995). Reported prevalence of attentional difficulties in a general sample of college students. *Journal of Psychopathology and Behavioral Assessment*, 17, 293-304.
- Wilens, T. E., Biederman, J., Mick, E., Faraone, S. V., & Spencer, T. (1997). Attention deficit hyperactivity disorder (ADHD) is associated with early onset substance abuse disorders. *The Journal of Nervous and Mental Disease*, 185, 475-482.
- Willcutt, E. G., & Pennington, B. F. (2000). Comorbidity of reading disability and attention-deficit/hyperactivity disorder: Differences by gender and subtype. *Journal of Learning Disabilities*, 33, 179-191.
- Willcutt, E. G., Pennington, B. F., Boada, R., Ogline, J. S., Tunick, R. A., Chhabildas, N. A., et al. (2001). A comparison of the cognitive deficits in reading disability and attention-deficit/hyperactivity disorder. *Journal of Abnormal Psychology*, 110, 157-172.
- Wilson, S. B., Mason, T. W., & Ewing, M. J. (1997). Evaluating the impact of receiving university-based counseling services on student retention. *Journal of Counseling Psychology*, 44, 316-320.
- Wren, C. (2000). *Hanging by a twig: Understanding and counseling adults with learning disabilities and ADD*. New York: W. W. Norton & Company.

## VITA

Douglas Joe Muller was born and raised in Clifton, NJ and graduated from Wheaton Central High School, Wheaton, IL in 1968. He earned a Bachelor of Science in Psychology from the University of North Dakota in 1972. During college, he was enrolled in Air Force R.O.T.C. and entered active duty upon graduation. While in the service, he obtained a Master of Arts in Correctional Counseling. He served as a B52 Radar Navigator, a Drug/Alcohol Counselor, and a Squadron Commander, and participated in Operations Desert Shield/Desert Storm as a Combat Support Commander. After retiring as a Major in 1993, he earned a Master of Social Work in 1997 and, later, became a licensed clinical social worker (LCSW), a licensed marriage family therapist (LMFT), a licensed professional counselor (LPC), and a certified substance abuse counselor (CSAC). He works as a psychotherapist.

He currently lives in Hampton, VA with his high school sweet heart and wife of 32 years, Jo. He has three children, Stacy, Robert, and Holly.