

A STUDY OF THE VALIDITY OF ADULT
ATTENTION DEFICIT DISORDER
SCREENING DEVICES

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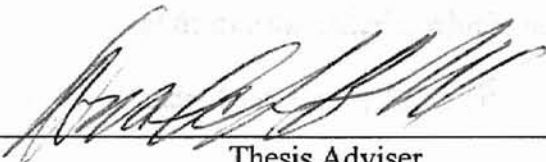
1996

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the degree of
MASTER OF SCIENCE
December, 1998


PREFACE

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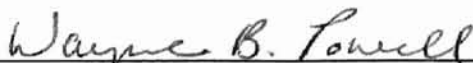
Thesis Approved:



Thesis Adviser







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PREFACE

This study was conducted to provide information on the validity of three measures of Adult Attention Deficit Disorder which have little validation currently available. The three measures include the Boatwright-Bracken Adult Attention Deficit Scale (BAADS), the Adult Attention Deficit Disorders Evaluation Scale (AADDES), and the Conner's Continuous Performance Test (CPT). An attempt was made to assess the validity of these scales based upon a set diagnostic criteria, which included a DSM-IV clinical interview, scores on the Wender Utah Rating Scale (WURS), and the Beck Depression Inventory (BDI).

I sincerely thank my thesis committee: Dr. Donald Boswell (Chair), Dr. Terry Stinnett, and Dr. Marie Miville. The continued support and guidance is greatly appreciated. I also thank Sandy Locke for the endless amount of work she put into this project. Finally, I would like to thank my parents and family for their continued support, both financial and emotional, during my educational journey.

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Chapter 1

“Attention deficit hyperactivity disorder (ADHD), a neurobiologically based disorder, is characterized by a symptomatic triad of inattention, impulsivity, and hyperactivity” (Jackson & Farrugia, 1997, p. 312). Until recently, most professionals viewed ADHD solely as a childhood disturbance with symptoms including attention difficulties, motor abnormalities (including hyperactivity and impaired coordination), impulsivity, disorganization, and altered response to social reinforcement. However, “it is estimated that between 30% and 50% of children diagnosed with attention deficit hyperactivity disorder will continue to exhibit symptomatology that is disruptive throughout their adult lives.” (Jackson et al., 1997, p. 312).

It can no longer be ignored that a significant number of our population may be affected by adult ADHD. ADHD “is now being diagnosed in a record number of adults. Several recent studies estimate that 6 million to 9.5 million American adults have the disorder, making it as common as severe clinical depression or drug abuse.” (Morrow, 1997, p. A.1). It is suggested that somewhere between 2% and 25% of the general population suffer from adult ADHD (Biederman, Faraone, Spencer, Wilens, Norman, Lapey, Mick, Lehman, & Doyle, 1993; Boatwright, Bracken, Young, Morgan, & Relyea, 1995; Sneed, 1995). These percentages alone are enough to warrant deeper investigation into the signs, symptoms, diagnosis, and treatment of adult ADHD.

ADHD in children has generated much research (Biederman, Faraone, Mick, Spencer, Wilnes, Kiely, Guite, Ablon, Reed, & Warburton, 1995). In contrast, studies of adults with ADHD are rare. The idea that ADHD continues to manifest itself throughout adulthood is a relatively new concept with minimal research to back it up (Biederman et

al., 1995). "After spotting it in generations of children, psychiatrists have only recently accepted that the disorder carries over into adulthood." (Morrow, 1997 p. 2). There may be at least 36 possible directions for research and treatment for adults with ADD, including finding an agreed-upon set of diagnostic criteria, looking at different medications which might alleviate ADD, and longitudinal research tracking ADD through childhood and into adulthood (Jaffe, 1995).

Finding an appropriate way to diagnose ADHD in adults has been problematic thus far (Jackson et al., 1997; Kane, Mikalac, Benjamin, & Barkley, 1990). The criteria set forth by American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, 4th edition, (DSM-IV), requires a childhood history of ADHD symptoms in order to make a diagnosis (American Psychiatric Association, 1994). However, most adults that are being evaluated for ADHD were not psychiatrically evaluated as children (Ward, Wender, & Reimherr, 1993). A problem with the diagnosis in adults is the retrospective diagnosis of childhood ADHD. Secondly, some of the clinical features of ADHD in adults mimic those of other disorders (American Journal of Psychiatry -Author, 1994). In order to make an accurate diagnosis, one must first be able to rule out any other disorders which may be accounting for the symptoms. To accurately diagnose adult ADHD, an agreed-upon set of rigorous criteria is needed (Jaffe, 1995).

Statement of the Problem

Attention Deficit Disorder has caused many children and adults significant impairment in a variety of ways. ADD is a syndrome which is usually characterized by serious and persistent difficulties resulting in: a) distractibility (poor attention span) b) impulsivity or weak impulse control c) hyperactivity in some cases (American

Psychological Association, 1994). The exact specifications of the disorder vary depending on which expert is describing them. Three distinct but compatible sets of symptoms for adult ADHD are offered by Weiss and Hechtman (1993), Wender (1987), and Bellak (1987), and a summary of those are given by Locke (1998):

A personality perspective of adult ADHD is given by Weiss and Hechtman (1993). Included in their characterization is attention deficits; difficulty in organizing work and completing tasks; a tendency to make sudden decisions without thinking of the consequences; and restlessness that may feel like “being driven.” The symptoms may manifest themselves in any of the following behaviors: lack of social integration/interpersonal problems, restlessness, impulsiveness, dependent characteristics, obsessive-compulsive tendencies, depression, low self esteem, lower education, poor concentration, explosiveness, sexual problems, and more attempts at suicide.

A contrasting approach is given by Bellak (1987), whose perspective seems to generate from a psychoeducational or neurological perspective. Bellak conceptualized adult ADHD in four categories: (1) perceptual-motor difficulties that may manifest in hypermotility, temper tantrums, high anxiety, and agitated depression; (2) reading and language difficulties with the attending lack of organizational skills; (3) neurologic soft signs that may show up as perceptual integration problems; and (4) attendant emotional problems of low self esteem, agitated depression, high anxiety, and problems in social/peer relations.

Finally, a widely used set of criteria for diagnosing adult ADHD was developed by Wender (1987). Wender’s criteria includes a required history of childhood disorder; persistent motor activity; and attention deficits. Furthermore, two of the following are

required: affective lability; inability to complete tasks; hot temper; impulsivity; stress intolerance. Other associated features may include marital instability and less success in academic and vocational areas than expected on the basis of intelligence and education.

The three examples given illustrate difficulties of diagnosing adult ADHD. Weiss and Hetchman (1993) identify adult ADHD through personality traits. Bellak (1987) uses neurological and psychoeducational means to identify the disorder. Wender (1987) gives diagnostic criteria. None of the above methods of diagnosing adult ADHD have been shown to be significantly more accurate than the others, as all of the above behaviors and traits are characteristic of adult ADHD.

In addition to the above diagnosis criteria, the DSM-IV gives standards for diagnosing adult ADHD as well. These standards have only recently been included in the American Psychological Association's manual. The first official recognition of attention deficit disorder was in the Diagnostic and Statistical Manual of Mental Disorders, third edition (DSM-III), (1980). The definition included symptoms both with and without hyperactivity. Under the criteria, children ages 7 and up could be diagnosed with ADD if they demonstrated impairments in organizing work, listening, finishing tasks, sustaining attention, or avoiding distractions. The hyperactivity component was not required, although it was acknowledged in some children.

The DSM-III-R (1987) renamed the disorder Attention Deficit Hyperactivity Disorder (ADHD), due to a lack of evidence that ADD occurred without hyperactivity. The manual included a list of 14 symptoms. One could be diagnosed with ADHD if he/she had any 8 of the 14 traits.

Finally, in 1994, the DSM-IV was published, including diagnostic criteria for both

ADD with and without hyperactivity. The terms for the categories are Attention-Deficit/Hyperactivity Disorder, Predominantly Inattentive Type; Attention-Deficit/Hyperactivity Disorder, Combined Type; and ADHD, Predominantly Hyperactive-Impulsive Type (added for cases in which hyperactive-impulsive symptoms occur without significant inattention symptoms).

The criteria for inattention as defined by the DSM-IV (1994) are as follows:

1. *Inattention*: six (or more) of the following symptoms of inattention have persisted for at least six months to a degree that is maladaptive and inconsistent with developmental level:

- (a) often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities
- (b) often has difficulty sustaining attention in tasks or play activities
- (c) often does not seem to listen when spoken to directly
- (d) often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)
- (e) often has difficulty organizing tasks and activities
- (f) often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)
- (g) often loses things necessary for tasks or activities, e.g., toys, school assignments, pencils, books, or tools
- (h) is often easily distracted by extraneous stimuli
- (i) is often forgetful in daily activities

(American Psychiatric Association, 1994, p. 83-84).

The criteria for hyperactivity-impulsivity as defined by the DSM-IV (1994) are as follows:

2. *Hyperactivity-Impulsivity*: six or more of the following symptoms of hyperactivity-impulsivity have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

Hyperactivity

- (a) often fidgets with hands or feet or squirms in seat
- (b) often leaves seat in classroom or in other situations in which remaining seated is expected
- (c) often runs about or climbs excessively in situations where it is inappropriate
- (d) often has difficulty playing or engaging in leisure activities quietly
- (e) is often “on the go” or often acts as if “driven by a motor”
- (f) often talks excessively

Impulsivity

- (g) often blurts out answers before questions have been completed
- (h) often has difficulty awaiting turn
- (i) often interrupts or intrudes on others

(American Psychiatric Association, 1994, p. 84).

The current DSM-IV criteria can be applied to children, adolescents, and adults. However, adults must experience these specified symptoms for at least 6 months to a degree that is maladaptive and inconsistent with their developmental level. There must also be evidence of some hyperactive-impulsive or inattentive symptoms that were

significant enough to cause impairment before age seven. Adults with ADHD must have impairment in two or more settings (school, work, or home), and there must be clear evidence of clinically significant impairment in social, academic, and occupational functioning. Finally, the symptoms must not occur exclusively during the course of a psychotic disorder or be accounted for by another mental disorder (Jackson et al., 1997; American Psychiatric Association, 1994).

Judging by this specific set of criteria, it seems that making an ADD diagnosis would not be complicated. However, “assessing impairment is complicated by the fact that some ADD symptoms vary considerably depending on task and context.” (Brown, 1995, p. 98). In addition, there are often several other possible diagnosis which could account for the subject’s ADHD symptoms. “In several studies, (ADHD) appeared to occur frequently with other diagnoses (comorbidity), and some of its clinical features mimic those of other disorders.” (American Journal of Psychiatry, Editorial, 1994, p. 634).

The obvious problem is the lack of a widely accepted and highly reliable means of assessing for adult ADHD. “At present, there is not single instrument or procedure that can adequately diagnose adult ADD. Unlike a twisted ankle, which can usually be definitively diagnosed by X ray as either broken or not broken, presently ADD can be diagnosed only be convergence of several different measures that allow an experienced clinician to determine how well the individual’s symptoms fit the profile of ADD, relative to other possible diagnosis.” (Nadeau, 1995, p. 102). To approach the assessment of ADD just by looking at a list of characteristics would be “to grossly misunderstand the complexity and deep interrelatedness of symptoms. Instead, each symptom on the list

must never be considered alone, but in the context of how it interacts with all other symptoms. Such an analysis should result in a geometric progression ending in a unique configuration for each individual.” (Locke, 1998). In other words, part of the reason the diagnosis of ADD is so difficult rests in the fact that, while one individual may be experiencing one or even some of the symptoms of ADD, they cannot be diagnosed ADD based on a checklist of criteria. Rather, the clinician has to look for the deeper interrelationship between the individual’s symptoms, environment, and history to name a few.

Purpose of the Study

The purpose of this study is to examine the relationship between some self report measures of ADHD and a continuous performance test by comparing them to a set of ADHD diagnostic criterion that have significant validation. The validity of the Boatwright-Bracken Adult Attention Deficit Scale(BAADS), the Adult Attention Deficit Disorders Evaluation Scale(AADDES), and the Conner’s Continuous Performance Test (CPT) will be examined. To that end, an attempt will be made to assess the validity of these scales based upon a DSM-IV clinical interview, the score on the Wender Utah Rating Scale (WURS), and the Beck Depression Inventory (BDI).

Research Questions

1. Is there a relationship between total scores on the AADDES and the diagnosis of adult ADHD based on the research criterion?
2. Is there a relationship between total scores on the CPT and the diagnosis of adult ADHD based on the research criterion?

3. Is there a relationship between the CPT diagnosis and the diagnosis of adult ADHD based on the research criterion?
4. Is there a relationship between total scores on the BAADS and the diagnosis of adult ADHD based on the research criterion?

Definition of Terms

Attention Deficit/Hyperactivity Disorder (ADHD): This disorder is symbolized ADHD. For the purposes of this paper, when ADHD represents the *adult* component/version of the childhood disorder, ADHD will be preceded by the word “adult”. In the DSM-IV (1994), there is no separate category or definition that distinguishes the adult disorder from the childhood disorder.

Assumptions

- Attention Deficit Disorder is a unique disorder characterized by definable traits and behaviors.
- The Wender, Beck, and DSM-IV structured interview used together are accurate diagnostic tools for Adult ADHD.
- The respondents will answer all questions as honestly as possible.

Chapter 2

It is likely that ADHD is one of the most misunderstood constructs in the field of education. Over the past decade, the definition of ADHD has consistently changed, leaving educators, parents, and teachers baffled as to what specifically constitutes an ADHD diagnosis (Wender, 1994). Given that the symptoms of ADHD are now shown to manifest themselves in all ages of the population, it is becoming more and more important to find an appropriate means of diagnosing and treating ADHD.

It has only been within the past decade that ADHD had been thought to persist beyond childhood into adulthood. Prior to this time, ADHD was believed to be a psychiatric syndrome of childhood that is outgrown with age (Wender, 1995).

While the recognition of adult ADHD is expanding rapidly, our knowledge base about diagnosis and treatment of adult ADHD struggles to keep pace. Biederman et al. (1993) state that "...because conceptual and methodological issues cloud its diagnosis, adult attention deficit hyperactivity disorder is not recognized in the official nomenclature and is infrequently a topic of investigation (p. 1793). Biederman et al. (1993) go on to call adult ADHD a diagnostic orphan and explain, "Clinicians who treat children do not usually follow up patients into adulthood, and adult attention deficit disorder is not often considered in adult psychiatric setting" (p. 1797). Part of the problem could be due to the history of Adult ADHD.

History of ADHD

For many years, ADHD was considered a childhood diagnosis that was outgrown in adulthood. (Barkley, Fischer, Edelbrock, & Smallish, 1990; Biederman & Faraone, 1996; Jackson et al., 1997; Wender, 1987). The 1960's and 1970's marked the first

attempts to chart the course of Attention Deficit Hyperactivity Disorder in children. The late 1970's and early 1980's marked the first studies which showed that ADHD symptoms continued into adolescence and adulthood (Biederman et al., 1996; Wender, 1987).

The adult version of ADHD was formally recognized in 1980 with its inclusion in the Diagnostic and Statistical Manual of Mental Disorders, third edition, (DSM-III), (1980). The official designation for the adult form of ADHD in this version was Attention Deficit Disorder, Residual Type (ADD, RT). The manual describes ADD, RT as the childhood version of ADHD that has evolved into adulthood minus the hyperactivity, but with the other major symptoms still present, such as concentration problems, impulsivity, attentional deficits, and impulsivity (Wender, 1995). In effect, the "signs of hyperactivity are no longer present, but other signs of the illness have persisted into the present without periods of remission, as evidenced by signs of attentional deficits and impulsivity, which result in some impairment in social and occupational functioning" (American Psychological Association, 1980, p. 45). Jaffe (1995) reports that this definition never caught on. But what did catch on "were the hyperactivity-dependent Utah Criteria devised by Dr. Wender and his colleagues." (Jaffe, 1995, p. 8). These criteria were stricter than those of the DSM-III, and specifically excluded a number of its criteria.

By the mid-1980s, many of the first longitudinal studies of ADHD children appeared in print. "All showed that ADD extended beyond childhood in at least a minority of cases" (Jaffe, 1995, p. 8). Between 30% and 80% of those children

diagnosed with ADHD would continue to have either the full syndrome or a variety of residual symptoms as adults (Boatwright et al., 1995; Wender, 1987).

The next edition of the DSM was published in 1987, the DSM-III-R. This edition converted ADD, RT into ADHD, RS (Attention-deficit hyperactivity disorder, residual state). Many saw this as a lost opportunity to publicize ADD (Jaffe, 1995). Other events occurred at this same time that began to heighten public awareness of ADHD. Between 1987 and 1995, research and interest in adult ADHD increased with a clinic for ADD adults opening in 1989, the publication of an extensive set of guidelines for assessing and treating ADHD adults, support groups for clients and families forming, newsletters, and an amazing increase in media coverage (Jaffe, 1995).

With the publication of the DSM-IV 1994, many had high expectations of the criteria for diagnosing adults with ADHD (Jaffe, 1995; Wender, 1987). “Hopes were high for the 1994 edition of the DSM (DSM-IV) to provide a category for adult ADD which lived up to the results of current research and the demands of both public and professional interest” (Kane et al., 1990, p. 617). Boatwright et al. (1995) said that “the description and criteria for ADHD in the recently published DSM-IV recognize even more clearly the continuation of the full or partial complement of symptoms into adulthood” (p. 107). Many shared Boatwright’s enthusiasm for the new criteria, but some did not. Jaffe (1995) doubted that the new criteria would promote the acceptance of adult ADHD. Jaffe disagreed with placement of adult ADHD in the section of the DSM-IV titled “Disorders Usually First Diagnosed in Infancy, Childhood, or Adolescence”. This placement was similar to that of ADHD in earlier versions of the DSM. Jaffe suggested that placing adult ADHD in the childhood section led to its neglect by adult psychiatry.

There is still not a separate category for adults. Adult ADHD is only mentioned in the childhood disorders section. Kane et al. (1990) and Jaffe (1995) both suggest that a placement of the adult ADHD diagnostic criteria in one of the adult sections of the DSM could make it a more recognized disorder.

Although there are mixed feelings on the current diagnostic criteria of adult ADHD, it appears that the DSM-IV, like its predecessors, falls short of meeting the diagnostic needs of both the professional community and their clients (Jaffe, 1995). These feelings suggest that further work needs to be done to make the criteria for adult ADHD more accessible in the DSM-IV and more easily distinguishable from the childhood disorder.

Incidence of ADHD

There have been no epidemiological studies to indicate how prevalent or disabling ADHD is in the adult population or whether its prevalence varies as a function of different risk factors. Weiss has come close to this type of study, tracking former child patients to a mean age of 25. Although a diagnostic status of the patients was not given, about one-third of the adult patients were described as having severe amounts of hyperactivity, inattention, or impulsivity. Mannuzza, Klein, Bessler, Malloy, and LaPadula (1993) followed up with patients at the mean age of 25. All patients had been diagnosed as ADHD as children. At age 25, 8% met the full criteria for Adult ADHD.

Like its predecessors, the DSM-IV fails to include information about the incidence of adult ADHD. The incidence has been computed in two different ways in the literature (Jaffe, 1995; Wender, 1995). One method of computation is taking the percentage of adult ADHD based on what percentage of childhood ADHD persists into

adulthood. The other is computing the percentage of adult ADHD in the general population.

“Incidence of childhood ADHD in the general population is reported to be between 2% AND 10%, however, clinical experience supports a much higher incidence, closer to 20%. Depending on the study, research indicates between 10%-80% of those children become adult ADD, producing an adult incidence between 2% and 16% in the general population.” (Locke, 1998, p. 22). But, as Biederman et al. (1993) report, adult results do not appear stable enough to be very helpful. Despite the actual incidence level, “as the children diagnosed with ADHD in the 1970s and 1980s enter adulthood, the phenomenon of ADHD in adults is expected to become a major clinical and public health concern, because an increasingly large population of clients will seek services for assessment, differential diagnosis, and management of their condition (Boatwright et al., 1995, p. 107).

The questions has been asked as to whether or not the incidence of ADHD is increasing. Wender states that “there are no data that support this proposition, but it is possible. Analogously, examination of the incidence and prevalence of the mood disorders suggests that not only are these conditions common, but their incidence may be increasing”(p. 46).

Assessment and Diagnosis of Adult ADHD

There tend to be three major assessment and diagnostic problems associated with adult ADHD. First, the diagnosis requires a history of ADHD in childhood. Secondly, several studies show that adult ADHD tends to occur frequently with other diagnoses (comorbidity) (Lavenstein, 1995; Ratey, Hallowell, and Miller, 1995). Finally, some of

adult ADHD's clinical features mimic those of other disorders (American Journal of Psychiatry Editorial, 1994).

A history of ADHD in childhood is easy to require in the criteria for adult ADHD, yet hard to elicit an accurate history when working with an adult client. Several factors may affect the recollection of childhood symptoms, including inaccurate recollection of distant events, mood shifts, and behaviors that have been well established. Individuals may forget hyperactivity, and others may exaggerate activity or inattention problems in childhood. This may be done to justify obtaining a specific treatment. Wender, Reimherr, and Wood (1981) found poor agreement between patients' and their parents' recollections of ADHD symptoms during childhood.

The idea of comorbidity between ADHD and other disorders exists. Particularly, there is overlap between ADHD and mood and borderline disorders. Although some ADHD criteria have tried to minimize this problem by using rule-outs that must be done prior to diagnosis, these rules are not part of the DSM system, vary considerably, and are not widely known.

Comorbidity with ADHD can be a problem from childhood to adulthood. One disorder which is specifically linked to childhood ADHD is anxiety disorders. "The overlap of anxiety disorders with ADHD has been found to be 25% to 40% in clinic referred children" (Barkley, 1996, p. 89). However, as the child grows older, the anxiety disorder is typically reduced and is generally almost nonexistent by adolescence.

Other disorders which are linked to childhood ADHD are also linked to adult ADHD. Many children with ADHD also have a specific learning disability. "Between 19% and 26% of children with ADHD are likely to have at least one type of learning

disability.” (Barkley, 1996). This is if the criteria is defined as significant delays in reading, arithmetic, or spelling relative to intelligence at or below the 7th percentile. If the criterion for a learning disability is simply two grades below grade level, than as many as 80% of ADHD children may have learning disorders (Barkley, 1996).

ADHD in itself is not a learning disability, but because it can interfere with concentration and attention, ADHD can make it extremely difficulty for a child to do well in school. Specifically, ADHD tends to affect a child’s performance in mastering language, reading, and math (Vail, 1987).

The learning disabled ADHD child may grow up to be an adults poor educational and occupational attainment. This is often linked to the learning disabilities that affected the individual during childhood. Even those who were not diagnosed with ADHD as children can typically look back on their childhood and recall symptoms of learning disabilities which affected them academically (Vail, 1987).

Even more seriously, ADHD in children tends to have a strong association with antisocial disorders (Barkley, 1996). Nearly half of all children with ADHD (mostly boys) tend to have oppositional defiant disorder (Greenberg, Horn, & Wade, 1991).

Adult ADHD patients are also thought to suffer from antisocial personality disorder, and much of the time this has developed in childhood. “Perhaps 15% to 25% of clinic referred children with ADHD will later qualify for a diagnosis of antisocial personality disorder in adulthood” (Barkley, 1996, p. 89).

“Comorbidity presents a problem for diagnosis in a clinical setting because it is often difficult to decide which of co-occurring conditions is the most important cause of

social or functional impairment and which is the most relevant focus for treatment.”

(American Journal of Psychiatry Editorial, 1994, p. 635).

Diagnosis of ADHD in adults is often missed by clinicians (Wender, 1995). One of the reasons why is that most clinicians who are treating adults obtain a cross-sectional history of the adult as opposed to a developmental history. The DSM reinforces this type of information gathering, focusing on current functioning. Clinicians are taught to ask about childhood, but the emphasis has long been on putative psychodynamics and not on the patient’s behavioral style (Wender, 1995).

Another issue the clinician faces when diagnosing ADHD in adults is determining which behaviors and symptoms are above and beyond that of the “norm”. Because most ADHD symptoms are experienced at some time by virtually everyone, the evaluating clinician has the task of assessing whether the individual is impaired by these symptoms substantially more than most persons of the same age or developmental level. (Brown, 1995). Brown (1995) states that “at present, there is no single instrument or procedure that can adequately diagnose ADHD. Presently, ADHD can be diagnosed only by convergence of several different measures that allow an experienced clinician to determine how well the individual’s symptoms fit the profile of ADHD, relative to other possible diagnoses.” (p. 102).

There are many professional opinions on the “best” means of assessing adult ADHD. Some believe that the most sensitive and useful instrument for assessment is a well-conducted clinical interview (Brown, 1995). According to Brown, the clinical interview establishes a context in which to understand the patient’s complaints. After this broad assessment of ADHD symptoms, the clinician can then go on to ask specific

questions, narrowing down each individual symptoms ascertaining the degree to which each specific symptom has been present and impairing in the individual's life.

Others believe that questionnaires asking the individual to assess their behavior are effective (Boatwright et al., 1995; Jackson et al., 1997; Wender, et al. 1987). Wender states that "the ADHD patient often cannot describe his behavior, for he has lived with it his entire life." (p. 140). When asked directly, as in a clinical interview, the individual may not be able to recall or describe the symptoms as necessary to make a diagnosis. Questionnaires give the individual the opportunity to read about a certain characteristic and assess whether or not that characteristic applies to them, rather than having to recall symptoms.

Still others have placed faith in continuous performance tests that assess the presence of ADHD symptoms by tracking the attention of the individual over a period of time (Baker, Taylor, & Leyva, 1995; Lassiter, D'Amato, Raggio, Whitten, & Bardos, 1994). These tools administer repetitive tasks and measure responses over a period of time. Continuous performance tasks generally ask participants to respond to only a specific combination of symbols in a stream of irrelevant symbols. They generally require participants to sustain attention and control behavior over a period of time (Biggs, 1995). Some educators and researchers feel that continuous performance tests are the best means of assessing adult ADHD because they measure the individual's attention without simply asking the individual to report on his or her own behavior, or respond to a questionnaire about his or her behavior (Brown, 1995; Lassiter et al., 1994).

Each of the above methods of testing represent a different approach to the assessment of adult ADHD. Because few empirically based guidelines for diagnosing

adult ADHD have been developed (Kane et al., 1990), many professionals have employed a relatively broad criteria in making the diagnosis. Brown (1995) states that “ultimately diagnosis of ADHD...involves integration and weighing of data from a variety of sources. An evaluating clinician needs to assess findings from clinical interviews including the individual’s presenting complaints, health history, school history, work hisotyr, social functioning, family history, psychiatric symptoms, and so forth, in the context of developmental history and overall levels of function.” (p. 105). The problem with this type of assessment is the length of time for the clinician to do this thorough of an assessment, and the cost of such an assessment to the individual.

Many researchers agree that what is needed is an agreed upon set of criteria for assessing adult ADHD (Jackson et al.,1997; Jaffe, 1995; Wender et al., 1987). In addition to this need set of agreed upon criteria, there is a need for an agreed upon diagnostic tool for assessing adult ADHD.

Chapter 3

Participants

There were a total of 26 participants in the study with 10 males and 16 females in the group. The majority of the participants were Caucasian (22), with 3 declaring Native American Status and 1 classifying themselves as Other. Participants ranged in age from 19 to 55 years, with a mean age of 36, a median age of 34.5, and a standard deviation of 9.27. All of the participants completed high school, with 20 of them currently being enrolled in college and 4 having completed a college degree.

Procedure

Participants for the study were recruited from fliers posted both on and off campus. Recruitment fliers were distributed to local counseling centers and testing centers. Fliers were also posted in many campus buildings, in local grocery stores, convenience stores, and shopping areas. The fliers announced a research project designed to study Adult Attention Deficit Disorder, offered free psychological screenings designed to assess the disorder, and then listed the name and phone number of the examiner so that the participant could call and schedule an appointment.

Two appointments were made with the participant - one appointment for the first half of the testing and the other for the second half of the testing. Participants received no monetary incentive for participating in the study. Participants were advised when they called and when data was collected that they were free to withdraw from the study at any time without repercussions.

During the participant's first session of testing, he/she was presented an

informed consent form, and was advised that he/she could elect not to participate in the study at any time. The subject also completed a demographic data form.

Participants received half of the battery of tests on each visit. One battery of tests consisted of the DSM-IV clinical interview, the BDI, the CPT, and the WURS. The other battery consisted of the AADDES, the BAADS, and the Rorschach Inkblot Test. Data from the Rorschach were not analyzed for this study. The experimenters counter balanced the administration of the halves. In addition to alternating the battery of tests, the order in which each test was given within the battery was randomly assigned.

The participants were assessed as ADHD adults if they met the criteria from the DSM-IV in the form of a structured interview, the Wender-Utah Rating Scale, and the Beck Depression Scale. Those participants who met the DSM-IV criteria and who score 36 or better on the WURS (46 or better if the BDI scores fall in the clinically significant range) were classified as adult ADHD.

Assessments were continued until there were 20 participants that had been diagnosed with ADHD and 6 participants that had not met the criteria for ADHD. In order to control for examiner bias, none of the diagnostic instruments were seen or scored by the examiner until the entire battery of tests was complete.

The assessments were done at two different times, and the two examiners were blind to each other's results. The examiners were counseling psychology doctoral students and counseling masters students. After each participant completed both sets of tests, results of the diagnostic battery were computed and the participant was sent his/her results. The Institutional Review Board approved this study before data collection began.

Instruments

The assessment of adult ADHD was made using the criteria from the DSM-IV in a semi-structured interview, the Wender-Utah Rating Scale (WURS), and the Beck Depression Inventory (BDI). The BDI was used to adjust cutoff scores for the WURS as suggested by Wender. In addition, the Boatwright-Bracken Adult Attention Deficit Scale (BAADS), the Adult Attention Deficit Disorder Evaluation Scale (AADDES), and the Conner's Continuous Performance Test (CPT) were administered.

Wender Utah Rating Scale

One of the most widely used and accepted criteria for establishing a retrospective diagnosis of ADHD was developed by Wender, Reimherr, and Ward (1985), titled *The Wender Utah Rating Scale* (WURS). Wender and his colleagues recognized the need for an instrument to effectively diagnose adult ADHD characteristics, and therefore the WURS was created for adult patients to use to describe their own childhood behavior.

“The conceptual model adopted by Wender is that adult ADHD is a continuation of a disorder that has its origins in childhood. A history of inattention and hyperactivity in childhood are thus logically necessary features. These features are part of Wender's criteria for ADHD in adults.” (American Journal of Psychiatry, Author, p. 634, 1994).

The WURS gives the subjects the opportunity to describe their behavior as children by asking a series of 25 questions. The questions were drawn from a 61 item pool of experimental questions (Ward et al., 1993). The subjects are instructed to rate the items that describe childhood behavior as not at all or very slightly (score=0), mildly (score=1), moderately (score=2), quite a bit (score=3), or very much (score=4) (Ward et al., 1993).

The WURS is simply scored by tallying the columns of 1's, 2's, 3's, and 4's at the bottom of the page, and added across for a grand total. The range of possible scores is between 0 and 100. A score of 36 is typically sufficient to receive the diagnosis of adult ADHD. However, Wender et al. (1985) have shown significant evidence to suggest that those clients who are clinically depressed may exhibit symptoms of adult ADHD. For this reason, a score of 46 or better is required to diagnose adult ADHD if the participant has been diagnosed as clinically depressed.

“The WURS attempts to establish that the client continued to experience (a) persistent motor activity (restlessness, inability to relax, nervousness, inability to persist in sedentary activities, continually active, and dysphoria when inactive) and (b) attention deficits (inability to keep the mind on conversation, distractibility, inability to concentrate on reading materials, difficulty focusing on the job, and frequent forgetfulness) into adulthood.” (Jackson et al., 1997 p. 312). In addition, Wender requires two of the following: affective lability; inability to complete tasks; hot temper; impulsivity; stress intolerance.

Reliability/validity data for the WURS is as follows:

“Split-half reliability correlations comparing odd/even item groups in the normal subjects indicated satisfactory internal reliability; the Spearman-Brown corrected correlation was $r=.90$ ($p<0.0001$, $N=100$).” (Ward, et al., 1993, p. 886). Validity was measured by calculating Pearson correlation coefficients between WURS scores and the Parent Rating Scale scores in subjects with ADHD and normal subjects. The correlations showed moderate validity: “for the normal subjects, $r=0.49$ ($p<0.0005$, $df=98$), and for the adults with ADHD, $r=0.41$ ($p<0.0005$, $df=65$).” (Ward, et al., 1993, p. 887).

Even though the WURS has been widely used and has a significant place in the literature, (Brown, 1995; Jackson et al., 1997; Nadeau, 1995; Rossini & O'Conner, 1995), it still remains controversial. "One fundamental problem with (the WURS) is the stipulation that the diagnosis of ADD in adulthood requires evidence of hyperactivity, both retrospectively in childhood and currently in adulthood (Brown, 1995. p. 100).

Another concern is that the symptoms used in the WURS to diagnose adult ADD could possibly be accounted for by other disorders (Biggs, 1995). Although the WURS is potentially the most widely used self-report for diagnosing adult ADD, these concerns raise questions as to whether or not it should be used *alone* as a diagnostic tool.

Finally, "Wender found poor agreement between patients' and their parents' recollection of ADHD symptoms during childhood and noted that parental recall was a better predictor of treatment response than patient recall, suggesting that parent information provides a more valid measure of childhood disorder (American Journal of Psychiatry, Author, 1994, p. 634).

Beck Depression Inventory

The Beck Depression Inventory (BDI) was administered to assess for depression since the WURS scores are impacted by depression. The BDI is a widely used measure of depression (Sundberg, 1992). It was developed in 1961 by Aaron Beck and associates at the University of Pennsylvania School of Medicine. It has been revised in 1971 and 1993.

The BDI has 21 items with four answer choices per item. The statements are answered 0 to 3 on a scale of severity of the statement. Subjects were instructed to answer the statements based on how they have been feeling in the last 2 weeks. Subjects

were also instructed to pick more than one answer if they applied. The highest answer for that question was used for computing the total score. The total score is computed by adding the individual scores together. A score of 0-9 is minimal depression; 10-16 is mild depression; 17-29 is moderate depression, and 30-63 is severe depression (Beck & Steer, 1993).

The BDI manual reports high correlations between the BDI and clinical rating of depression in psychiatric samples (.72) and normal samples (.60). Correlations between the BDI and the MMPI-D and Hamilton Depression Scale are moderate to high. Results of validity and reliability studies show strong support for the BDI in assessing depression (Beck et al., 1993).

Boatwright-Bracken Adult Attention Deficit Scale

The Boatwright-Bracken Adult Attention Deficit Scale (BAADS) “was designed to incorporate empirically documented manifestations of ADHD in adults derived from the scientific literature. The scale is self-administered and provides (a) a means of documenting the childhood history required for an adult ADHD diagnosis and (b) an assessment of current ADHD symptoms” (Boatwright et al., 1995, p. 111).

The BAADS has two sections. The first section contains 54 questions and assesses the patient’s memory of child-related ADHD symptoms, called the Childhood Memories Scale (CMS). The second section contains 53 questions and assesses current conditions related to adult ADHD, called the Current Adult Symptoms Scale (CASS). These two parts work together to form a single instrument to assess both the childhood memories of ADHD symptoms and the current adult symptoms that are necessary to diagnose ADHD (Boatwright, et al., 1995).

These questions are divided into three subscales: Inattention, Impulsivity, and Hyperactivity (the Clinical subscales). “Across these three Clinical subscales, ADHD context-related problems in the domains of Personal Life, School/Occupations, and Social Life (the Environmental subscales) were sampled. In addition, items embedded within the Clinical and Environmental subscales were designed to assess both internal experience, such as feelings and attitudes, as well as external dimensions indicative of the expression of ADHD in the respondent’s behaviors in day-to-day life. (Boatwright, et al., 1995, p. 114).

After conducting preliminary reliability and validity tests, Boatwright et al. concluded the following:

The BAADS was shown to have strong internal consistency in two independent samples, as well as high test-retest stability at all scoring levels. Strong construct stability (validity) as assessed by the CMS and CASS across administrations was also demonstrated. At the Total Scale levels the BAADS had sufficient reliability ($r > .90$) to be employed for placement purposes, as well as diagnostic and research purposes.

Content validity of the BAADS was ensured by sampling literature-supported ADHD diagnostic criteria and by having a team of expert psychologists independently review and rate each scale item by DSM-III-R criteria for age relevance and diagnostic utility across the Clinical, Environmental, and Locus domains. Thus, the BAADS content has been demonstrated to be developmentally appropriate at both the child and adult level in terms of clinical symptomatology of ADHD as well as the internal and external

experiences of ADHD in an individual's personal, school/occupational, and social life (p. 122).

Although the preliminary reliability/validity tests show promise for the BAADS, there is not yet enough research conducted on the test to justify using the BAADS alone as a diagnostic tool for adult ADHD.

Adult Attention Deficit Disorders Evaluation Scale

The Adult Attention Deficit Disorders Evaluation Scale (AADDES) was designed to provide a measure of hyperactivity-impulsivity and inattention in adults. The AADDES was developed to comply with the DSM-IV criteria that ADHD "must be present in at least two settings". The scale is divided into three sub-sections: self report, work and home. Therefore, the scale uses three raters. The individual completes the "self report". The "home" and "work" subsections were designed to identify settings in which ADHD might be affecting the individual, and were designed to be answered by employers, supervisors, co-workers (for the "work" subsection), and the spouse or other relatives (for the "home" subsection) (McCarney & Anderson, 1996).

The AADDES is made of 58 items representing ADHD behavior. The rater answers the questions using one of the following quantifiers: 0=does not engage in the behavior; 1=one to several times per month; 2=one to several times per week; 3=one to several times per day; 4=one to several times per hour. "The sum of the subscale standard scores is used to determine a percentile score for an overall measure of Attention-Deficit/Hyperactivity Disorder." (McCarney et al., 1996). Raw scores are converted to standard scores, and then to percentile scores. "The percentile score is a global measure of behavior and provides a reference of the client or patient's behavior in

comparison to adults in a standardization sample. Percentile scores on the AADDES refer to the percentage of adults whose score occurred at or below that sum of subscale standard scores.” (McCarney et al., 1996).

The authors of the AADDES conducted preliminary reliability/validity measures, with the following results:

A Pearson Product Moment Correlation Coefficient of .77 indicates a substantial degree of test-retest reliability. Internal consistency of the instrument was used as a measure of reliability. The coefficient alpha formula was used, resulting in uniformly high values of the reliability subscales, with all alpha reliability coefficients well above the .80 minimum acceptable reliability level. The total score’s internal consistency reliability was .98 (McCarney et al., 1996).

Content validity was assessed for each item on the scale by using a panel of psychiatrists and psychologist to review the questions and provide feedback. The correlations for each of the items with the total score were all significant at the .001 level. “The Pearson Product Moment Correlation of each item with the total score on the entire scale was used to establish the discriminating power of the items. This procedure is generally used to ensure internal consistency of scales and confirm the discriminating power of each question on the scale.” (McCarney et al., 1996 p. 16).

The AADDES is a relatively new scale to assess the presence of adult ADHD. Although from the preliminary studies that the scale is an accurate assessment for adult ADHD, further investigation needs to be done before it should be used on its own as an assessment tool.

Conner's Continuous Performance Test

“The Continuous Performance Test (CPT) is a computer-administered task that is purported to measure sustained attention. The CPT was first developed to differentiate brain-damaged from normal individuals. More recently, the CPT has become a popular instrument for clinical neuropsychologists to use in assessing both children and adults thought to possess attention deficits” (Lassiter et al., 1994, p. 179).

The subject sat at a computer and was instructed to “respond only to a specific combination of symbols in a stream of irrelevant symbols” (Biggs, 1995, p. 118). In this study, alphabet letters were presented on the screen, and the subject was instructed to hit the space bar for every letter except for the letter “X”. The letters appeared on the screen at an irregular pace. The CPT requires the subject to sustain attention and control behavior over a period of time and with varying degrees of feedback (Biggs, 1995).

The CPT measures response inhibition. It also measures response patterns at various speeds of stimulus presentation, allowing a measure of visual-processing ability at various rates. The CPT provides measures of omissions, commissions, reaction times, and variability of responses during the 14 minute task (Biggs, 1995).

One criticism of the CPT is that it measures visual distractibility only. Individuals tend to vary in the degree to which they are affected by visual in comparison to auditory distraction (Taylor, 1994).

The computerized CPT is a widely used test to measure sustained attention (Lassiter, et al., 1994; Meents, 1989), however, it has only been recently introduced as a measure of adult ADHD. Little validity or reliability information is available on the use of the CPT as a diagnostic instrument for adult ADHD.

Hypothesis

The purpose of this study is to validate the Boatwright-Bracken Adult Attention Deficit Scale (BAADS), the Adult Attention Deficit Disorders Evaluation Scale (AADDES), and the Conners Continuous Performance Test (CPT) based on the DSM-IV clinical interview, the Wender-Utah Rating Scale (WURS), and the Beck Depression Inventory (BDI). The usefulness of this is to further validate effective means of assessing Adult ADHD. Validation of the CPT is of particular importance. It is one of the few means of assessing adult ADHD which does not involve self-reporting of symptoms.

The following null hypotheses correspond to the research question in Chapter One:

Ho1: There is no significant relationship between total scores on the AADDES and the research diagnosis criterion of Adult ADHD.

Ho2: There is no significant relationship between total scores on the CPT and the research diagnosis criterion of Adult ADHD.

Ho3: There is no significant relationship between the CPT diagnosis of Adult ADHD and the Adult ADHD diagnosis based upon the research diagnosis criterion.

Ho4: There is no significant relationship between total scores on the BAADS and the research diagnosis criterion of Adult ADHD.

The following alternative hypotheses correspond to the research question in Chapter one:

Ha1: There is a significant relationship between total scores on the AADDES and the research diagnosis criterion of Adult ADHD.

Ha2: There is a significant relationship between total scores on the CPT and the research diagnosis criterion of Adult ADHD.

Ha3: There is a significant relationship between the CPT diagnosis of Adult ADHD and the Adult ADHD diagnosis based upon the research diagnosis criterion.

Ha4: There is a significant relationship between total scores on the BAADS and the research diagnosis criterion of Adult ADHD.

Analysis of Data

A Pearson product-moment correlation will be used to measure the degree of correspondence between all measures of adult ADHD examined in this study. Of particular importance is the relationship between scores on the AADDES, the BAADS, and the CPT with the adult ADHD research diagnostic criterion. The Pearson is one of the most widely used measures of correlation, and can be considered the statistical tool of choice when the relationship between the variables is linear (Cohen, R.G., Montague, P., Nathanson, L.S., Swerdlik, M.E., 1988). The squared Pearson correlation will provide a percentage of the variance that is shared between the diagnostic tests and the experimental diagnostic tests.

Limitations

1. This study has a limited sample size
2. Non-random sampling was used
3. There is a lack of consensus criteria for the diagnosis of adult ADHD.
4. The study is of an underinvestigated, underdefined population and is exploratory in nature.

5. Lack of attention to comorbid disorders other than depression may confound results.

Chapter 4

In order to answer the research questions and to gain a better understanding of the results of the study, Pearson Product Moment Correlation Coefficients were computed.

Table 1 is included, giving a visual representation of the results of the study. The research questions are then answered based on the results of the correlation.

The Pearson Product Moment Correlation Coefficient was computed for all measures of Adult ADHD used in this study. The correlation matrix of the assessment devices used in this study are presented in Table 1. Included is the correlation coefficient.

Table 1
Correlation Matrix of Assessment Devices

| | AADDES | BAADS | BDI | CPT | CPT Diagnosis | DSM Interview | WURS |
|------------------|----------|----------|--------|----------|------------------|------------------|----------|
| AADDES | 1.00 | -.5237** | -.2184 | .0698 | .1699 | -.4162** | -.4683** |
| BAADS | -.5237** | 1.00 | .1326 | .0201 | -.0505 | .5973*** | .5239 |
| BDI | -.2184 | .1326 | 1.00 | -.2094 | -.2510 | .2206 | .2285 |
| CPT | .0698 | .0201 | -.2094 | 1.00 | .8756*** | .3319* | .2126 |
| CPT Diagnosis | .1699 | -.0505 | -.2510 | .8756*** | 1.00 | .2594 | .0581 |
| DSM Interview | -.4162** | .5973*** | .2206 | .3319* | .2594 | 1.00 | .6362 |
| WURS | -.4683 | .5239 | .2885 | .1126 | .0581 | .6362 | 1.00 |

* p < .05

** p < .01

*** p < .001

Research Question 1

Research question 1 asked the following: What is the relationship between total scores on the AADDES and the diagnosis of adult ADHD based on the research criterion? In order to answer research question 1, the following null hypothesis was

tested: There is no significant relationship between total scores on the AADDES and the research diagnosis criterion of Adult ADHD.

Results show that there is a significant relationship between the AADDES and the research diagnosis criterion of Adult ADHD ($r = -.43, p < .01$). The null hypothesis is rejected in favor of the alternative hypothesis, which states the following: There is a significant relationship between total scores on the AADDES and the research diagnosis criterion of Adult ADHD. The data suggests that 17% of the variance of the research diagnosis criterion is accounted for by the AADDES.

Research Question 2

Research question 2 asked the following: What is the relationship between total scores on the CPT and the diagnosis of adult ADHD based on the research criterion? In order to answer research question 2, the following null hypothesis was tested: There is no significant relationship between total scores on the CPT and the research diagnosis criterion of Adult ADHD.

Results show that there is no significant relationship between the CPT and the research diagnosis criterion of Adult ADHD. In this case, the researcher fails to reject the null hypothesis.

Research Question 3

Research question 3 asked the following: What is the relationship between the CPT diagnosis and the diagnosis of adult ADHD based on the research criterion? In order to answer research question 3, the following null hypothesis was tested: There is no significant relationship between the CPT diagnosis of Adult ADHD and the research diagnosis criterion of Adult ADHD.

Results show that there is no significant relationship between the CPT diagnosis

CPT AADDES CPT ADHDCRITERION

and the research diagnosis criterion of Adult ADHD. In this case, the researcher fails to reject the null hypothesis.

Research Question 4

Research question 4 asked the following: What is the relationship between total scores on the BAADS and the diagnosis of adult ADHD based on the research criterion? In order to answer research question 4, the following null hypothesis was tested: There is no significant relationship between total scores on the BAADS and the research diagnosis criterion of Adult ADHD.

Results show that there is a significant relationship between the total scores on the BAADS and the research diagnosis criterion of Adult ADHD ($r = .71, p < .001$). The null hypothesis is rejected in favor of the alternative hypothesis, which states the following: There is a significant relationship between total scores on the BAADS and the research diagnosis criterion of Adult ADHD. This data suggests that 49% of the variance of the BAADS is accounted for by the research diagnostic criterion.

Chapter 5

Summary of Findings

Results of this study showed a significant relationship between the research diagnostic criteria for adult ADHD and the AADDES, as well as a significant relationship between the diagnostic criteria and the BAADS. No significant relationship was found between the research diagnostic criteria and the total scores on the CPT, or between the research diagnostic criteria and the CPT diagnosis.

Conclusions

The research instrument with the strongest relationship with the diagnostic criteria used to determine adult ADHD was the BAADS ($r=.71, p<.001$).

The AADDES correlated negatively with the research criterion for Adult ADHD ($r = -.43, p<.01$). This negative correlation probably resulted from the means of scoring the instruments. For all of the instruments in the research criterion, a higher score indicates a greater chance of diagnosing Adult ADHD. For example, the WURS requires a *minimum* score of 36 (with no depression diagnosis in the participant) to diagnose adult ADHD. However, the AADDES operates on the opposite principal. A lower score on the AADDES indicates a greater chance of diagnosing Adult ADHD. The AADDES requires a *maximum* standard score of 10 to diagnose adult ADHD.

The scores on the CPT did not correlate significantly with the research criterion for Adult ADHD. Taking the analysis a step further, the Adult ADHD diagnosis based on the CPT also failed to significantly correlate with the research criterion for Adult ADHD.

Implications

This study further validates the use of the BAADS as a means of assessing adult

ADHD. Although the BAADS is a fairly new diagnostic instrument for Adult ADHD, both past and present validity and reliability studies suggest that it may be an acceptable means of assessing Adult ADHD (Boatwright et al, 1995). However, clinicians should be cautious in using the BAADS as a sole means of assessing adult ADHD.

In this study, the AADDES is shown to have a significant relationship with the research criterion used in this study; however, taken as a validity coefficient, this relationship is weak. Even though some support for the validity of the AADDES as a measure of ADHD was found in this study, clinicians should be cautious in its use as a sole measure of adult ADHD. In addition, it should be pointed out that only the self report portion of the AADDES was used and that combined with the other components of the AADDES (Home and Work forms), the AADDES may be a better measure of adult ADHD

One possibility for the lack of a significant relationship between the CPT and the research criterion for Adult ADHD is the difference in the types of test. All of the instruments in the research criterion were self-report instruments. One criticism of self-report instruments is that participants may be able to “fake” a diagnosis by familiarizing themselves with the symptoms of the disorder and expressing them in the self report instruments (Baker et al., 1995).

The authors of the CPT attempt to eliminate the possibility of faking the disorder by assessing for it in a different way. The CPT measures attention capacity based on visual stimuli. The CPT measures both errors of omission (failing to respond when the appropriate letter appears on the screen), and errors of commission (responding when the wrong letters appear on the screen). It is thought that errors of omission are related to cognitive ability, while errors of commission are often related to impulsivity (Lassiter et

al., 1994).

Another possibility for the lack of correlation between the CPT and the research diagnostic criteria lies in the constructs measured by the CPT. As stated previously, the use of the CPT to diagnose ADHD is a fairly new concept. Little data exists concerning the constructs measured by the CPT (Lassiter et al., 1994). Although the CPT has been shown to correlate with attention and impulsivity, it has also been shown to correlate with arithmetic portions of intelligence tests, cognitive deficits, and verbal ability (Gordon, 1990). The construct specificity of the CPT remains questionable. Conflicting results of numerous studies make it difficult to determine what the CPT measures. Therefore, the lack of a significant relationship with the diagnostic criterion could have resulted from the fact that different constructs were being measured.

Limitations of the Study

It should be noted that the sample size in this study is restricted and therefore generalizations beyond this study should not be made until data on a broad range of subjects have been obtained. It is possible that the relationships found in this study are due to the uniqueness of the sample.

Another limitation of this study was the use of non-random sampling. Most participants admitted that they came in to be tested with the presumption that they would meet the criteria for adult ADHD. Non-random sampling further limits generalizations that should be made beyond this study.

As stated many times throughout this paper, there is a lack of consensus criteria for the diagnosis of adult ADHD. For this reason, the researchers created a research diagnostic criterion, composed of a DSM-IV clinical interview, the WURS, and the BDI. These diagnostic criterion do have faults. One criticism of the DSM-IV criteria is that

not all of the specified ADHD symptoms in adults have to be present since childhood. An opposing view, however, is a criticism of the DSM-IV criteria because of its emphasis on the importance of childhood symptoms for an adult diagnosis (Brown, 1995). A criticism of the WURS is that it focuses solely on childhood symptoms. The WURS assumes that adults of any age are capable of recalling specific behavior patterns before the age of 7. The limitation here rests in the fact that the experimental diagnostic instruments were compared against instruments that have not been completely recognized as valid and reliable diagnostic instruments for adult ADHD.

The only comorbid disorder that this study allowed for was depression. No further assessment was done to detect other disorders that are typically associated with adult ADHD. For this reason, results may be confounded by other disorders that were not assessed in this study.

Recommendations for Future Research

It is recommended that a similar research study be conducted a larger sample size. In addition, stratified sampling would be useful in this experiment. Stratified sampling would allow the researchers to gather participants from two subgroups: ADHD and non-ADHD. Having an equal sample of both ADHD and non-ADHD participants would be useful in this study. Both a larger sample size and stratified sampling would allow greater generalizability to the population.

In order to further validate the AADDES, one may want to carry out a similar validity study utilizing all three sections of the AADDES. For this study, only the “self report” section of the AADDES was used. The AADDES also includes a “home” and “work” section to be completed by someone who is close to the individual in these settings. This allows an assessment of the participant based not only on self-report, but

on the observations of others close to the participant. Utilizing both the “home” and “work” sections of the AADDES would, more than likely, significantly improve the validity of the instrument.

The constructs measured by the CPT need to be determined. Although some research has been done in this area, there has not been enough done to create a specific list of measured constructs. It has been determined that the CPT measured attention and impulsivity, but without knowing what else is being measured, it is impossible to infer that the CPT is a reliable instrument to assess adult ADHD.

Another area for research in regards to the CPT lies in the way in which the data is presented to the subjects. The CPT presents visual stimuli, and the results of the subject’s performance are considered to be a measure of attention. However, consideration has not been given to the similarities and differences in attentional capacity when stimuli are presented auditorally (Baker, et al., 1995). A similar analysis using auditory stimuli, or a combination of auditory and visual stimuli, would acknowledge the many avenues of attentional capacity.

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Appendix A

DEMOGRAPHIC INFORMATION

1. Name:
2. Age:
3. Gender:
4. Ethnicity: Hispanic
African American
Asian American
Native American
Caucasian
Pacific Islander
Other
5. Major or Occupation:
6. Classification (if student): Years of Schooling (if not a student):
 Freshman Grade School
 Sophomore Jr. High
 Junior High School
 Senior Some College
 Graduate Graduated College
7. Do you smoke? yes no
8. Are you taking any psychotropic medications such as Ritalin or antidepressants? If So, please list:_____.
9. Do you have any visual impairments? Nearsighted
 Farsighted
 Astigmatism
 Colorblindness
 Other
 None

Appendix B

CONSENT FOR PARTICIPATION IN RESEARCH

I, _____, fully consent to participate in the OSU research investigation entitled "Adult Attention Deficit Disorder: A Multidimensional Validation Study.

I understand that my participation will take about 4 hours divided into two sessions and will involve taking the following tests: The Conners Continuous Performance Task, The Adult Attention Deficit Disorders Evaluation Scale, the Boatwright-Bracken Attention Deficit Scale, the Rorschach inkblot test, appropriate subtests of the WAIS-R, DSM-IV semi-structured interview, Wender-Utah Rating Scale, Beck Depression Inventory, and a Demographic Questionnaire.

I understand that after completion of all tests, I will receive a report based upon a portion of the diagnostic battery indicating whether or not results indicate that I may have adult Attention Deficit Hyperactivity Disorder. If, however, you do not complete the battery of tests we will be unable to provide you with a report.

I understand that there are certain limits to confidentiality, in which it is required by law and/or professional ethics that a psychological researcher/associate reveal information to other persons or agencies, without my permission. These limits to confidentiality are as follows:

- A. If I threaten grave bodily harm or death to a reasonably identified person, a psychological associate may be required (1) to inform appropriate legal authorities and the intended victims; (2) to arrange for voluntarily hospitalization-, or, (3) to take appropriate steps to initiate proceedings for involuntary hospitalization pursuant to law.
- B. If I express a serious intent to grievously harm myself, it may be necessary for a psychological associate (1) to reveal information to family members and/or persons authorized to respond to such emergencies, in order to protect me from harm; (2) to arrange for voluntarily hospitalization; or, (3) to take appropriate steps to initiate proceedings for involuntary hospitalization pursuant to law.
- C. If a court of law issues a legitimate subpoena, a psychological associate may be required to provide information that is specifically described in the subpoena.
- D. If I am being evaluated or treated by order of a court of law, the results of the evaluation or treatment ordered may be revealed to the court through a subpoena by the judge.

- E. If a psychological associate has good reason to suspect that a child is a victim of physical abuse, sexual abuse, or neglect, he/she is required to report the abuse or neglect to the Department of Human Services and/or law enforcement authorities.
- F. If I use psychological treatment and/or records in my behalf in a legal proceeding, the records must be made available to both parties.

I understand these limitations to confidentiality as outlined above.

I also know that participation in this study is voluntary. There is no penalty for refusal to participate, and I am free to withdraw my consent and participation in this project at any time without penalty after notifying the project director.

I may contact Dr. Donald Boswell of OSU's Counseling Psychology department either at Willard Hall or by calling 405/744-6036. I may also contact Gay Clarkson, ERB Executive Secretary, 305 Whitehurst, Oklahoma State University, Stillwater, OK 74078; Telephone: 405/ 744-5700.

The purpose of this investigation is to further knowledge on adult attention deficit hyperactivity disorder and its diagnosis. Results will also increase our understanding of the personalities of adults with ADHD. Thank you for your participation!

I have read and fully understand the consent form. I sign it freely and voluntarily. A copy has been given to me.

Date: _____ Time: _____ (a.m./p.m.)

Signed: _____
Signature of Subject

I certify that I have personally explained all elements of this form to the subject before requesting the subject to sign it.

Signed: _____
Project Director or his authorized representative

Appendix C

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

DATE: 10-21-98

IRB #: ED-99-038

Proposal Title: A STUDY OF THE VALIDITY OF ADULT ATTENTION
DEFICIT DISORDER SCREENING DEVICES

Principal Investigator(s): Don Boswell, Sherry Overton

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Signature:

Carol Olson (cse)

Date: October 22, 1998

Carol Olson, Director of University Research Compliance
cc: Sherry Overton

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modification to the research project approved by the IRB must be submitted for approval. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

VITA

Sherry Overton

Candidate for the Degree of

Master of Science

Thesis: A STUDY OF THE VALIDITY OF ADULT ATTENTION DEFICIT
DISORDER SCREENING DEVICES

Major Field: Counseling and Student Personnel

Biographical:

Personal Data: Born in Enid, Oklahoma on September 7, 1974 to
Mark and Jeanie Overton.

Education: Graduated from Covington-Douglas High School, Covington,
Oklahoma in May 1992; received Bachelor of Science degree in
Psychology from Oklahoma State University, Stillwater, Oklahoma in
December 1996. Completed the requirements for the Master of Science
degree with a major in Community Counseling at Oklahoma State
University in December, 1998.

Experience: Internship Counselor at Oklahoma State University Personal
Counseling Services, August 1997-May 1998; Counselor at Oklahoma
State University-Oklahoma City Counseling Center, June 1998-present.
Graduate Assistant in the Oklahoma State University Edmon Low Library,
December 1996-August 1998.

Professional Memberships: National Academic Adviser Association, Oklahoma
Academic Adviser Association.