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THE RELIABILITY AND VALIDITY OF THE BOATWRIGHT-BRACKEN
CHILD ATTENTION DEFICIT SCALES:
CHILD AND PARENT VERSIONS

by

Erica S. Thomas

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Psychology

Approved:

UTAH STATE UNIVERSITY
Logan, Utah

2004

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ABSTRACT

The Reliability and Validity of the Boatwright-Bracken Child
Attention Deficit Scales: Child and Parent Versions

by

Erica S. Thomas, Master of Science

Utah State University, 2004

Major Professor: Dr. Gretchen Gimpel
Department: Psychology

This study examined the psychometric properties of a new measure of attention-deficit/hyperactive disorder (ADHD) symptoms, the Boatwright-Bracken Child Attention Deficit Scale (BCADS), self- and parent-report forms. Parents and children with and without ADHD completed the BCADS to determine the reliability and validity of the BCADS. The BCADS-Child and Parent had high internal consistency reliability. The total sample parent-self ratings were moderately correlated, indicating a typical level of cross informant agreement.

Results indicate that the BCADS differentiates children with ADHD from children without ADHD. Children and parents in the clinical sample reported more symptoms of ADHD than those in the comparison sample. Children with and without ADHD reported fewer symptoms of ADHD than their parents. Parents' ratings on the BCADS were moderately to highly correlated with an existing measure of ADHD.

Overall, the results indicate the BCADS-Child and Parent forms are internally reliable and valid measures to use when assessing ADHD.

(84 pages)

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Erica S. Thomas

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CHAPTER I

INTRODUCTION

Typically, attention-deficit/hyperactivity disorder (ADHD) is diagnosed primarily by gathering information from parents and teachers through interviews and informant-based rating scales. Although some information may be obtained from the child through an interview or broadband self-report measure, a self-report of ADHD symptoms has typically not been incorporated in the diagnostic battery for ADHD.

Utilizing the child's perspective has been considered inappropriate due to the child's lack of cognitive development (Hope et al., 1999). In addition, there are concerns regarding the validity of child self-report measures, particularly for externalizing behaviors. Although there may be some problems with self-report measures, examining children's self-reported behaviors may aid in diagnosis and treatment because it gives the examiner the child's perspective of what behavior problems are being exhibited. In addition, including children in the diagnosis of their own ADHD symptoms may increase their understanding and acceptance of ADHD, as well as compliance with treatment (Robin & Vandermay, 1996).

The Boatwright-Bracken Child Attention Deficit Scale is a new scale intended to measure ADHD symptoms in children ages 8-18. Self-report (BCADS-Child), parent report (BCADS-Parent), and teacher report (BCADS-Teacher) forms are available. Because these measures have been recently developed, their psychometric properties have not yet been investigated. Consequently, there is a need to investigate the reliability and validity of these measures for the purpose of using them in the

ADHD diagnostic process. The purpose of this research project was to examine the psychometric properties of the BCADS-Child and BCADS-Parent.

The specific objectives of this research project were:

1. To evaluate the internal consistency of the BCADS-Child and BCADS-Parent subscale and total scale scores in a sample comprised of both children with and without ADHD, as well as those samples separately. It was hypothesized that the internal consistency of both measures would be moderate to high, with correlation coefficients .80 or above.
2. To determine the cross-informant agreement between child and parent report of ADHD symptoms as measured by the BCADS. It was hypothesized there would be low to moderate correlations between the scores of the BCADS-Child and BCADS-Parent. The hypothesis was formulated due to the low agreement between child and parent raters in general.
3. To determine if there are significant differences between ratings on the BCADS-Child and BCADS-Parent. It was hypothesized that children would report lower levels of ADHD symptoms than their parents.
4. To determine if there are significant differences between children with ADHD and children without ADHD on the subscale and total scores of the BCADS-Child. It was hypothesized that children with ADHD would self-report higher levels of ADHD symptoms than children without ADHD.
5. To determine if there are significant differences between ratings of parents of children with ADHD and ratings of parents of children without ADHD on the subscale

and total scores of the BCADS-Parent. It was hypothesized that parents of children with ADHD would report more ADHD symptoms for their children than parents of children without ADHD.

6. To determine the relationship between the BCADS-Parent and the Attention-Deficit/Hyperactivity Disorder Symptoms Rating Scale (ADHD-SRS; a previously developed and validated measure of ADHD). It was hypothesized there would be a high correlation between the subscale and total scores of the BCADS-Parent and the ADHD-SRS.

7. To determine the relationship between the BCADS-Child and the ADHD-SRS. It was hypothesized there would be a low to moderate correlation between the subscale and total scores of the BCADS-Child and the ADHD-SRS. The hypothesis was formulated due to the low correlation among child and parent ratings for other social-emotional assessment measures.

CHAPTER II

REVIEW OF RELATED LITERATURE

Attention-Deficit Hyperactivity Disorder

ADHD is one of the most frequent reasons children are referred to outpatient mental health clinics (Frick & Lahey, 1991). It is estimated that ADHD affects up to 50% of clinic-referred children, and approximately 3-5% of all school-age children (Brown, 2000).

ADHD involves a persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequent and severe than typically observed in children at comparable levels of development. Symptoms must be evident in more than one type of setting for diagnosis (American Psychiatric Association [APA], 2000). In children, symptoms are typically seen in both the home and school setting. This cross-setting requirement ensures the symptoms are pervasive and not situational in nature (Solanto, Arnsten, & Torrance, 2001). However, it is unusual for a child to display the same level of dysfunction in all settings or within the same setting at all times. Symptoms typically arise in situations that require sustained attention or lack novelty. To be diagnosed with ADHD, the symptoms exhibited must interfere with developmentally appropriate social, academic, or occupational functioning (APA).

In classroom settings, children with ADHD often engage in tasks or activities unrelated to instruction or classroom activities. Children may also demonstrate an uneven and unpredictable pattern of behavior in the classroom, causing the teacher to

see the child as noncompliant rather than not understanding the material. For example, a child may display inattentiveness or avoid a school assignment due to the lack of interest or novelty of the assignment (Goldstein & Goldstein, 1998).

Some children with ADHD have difficulty thinking before they act and weighing the consequences of their actions. They may have difficulty following rule-governed behavior. Children with ADHD often have difficulty interpreting the consequences of their past behavior. This may interfere with social relationships with teachers, peers, and parents because they are not cognizant of their behavior or the effects it has upon their environment (Gentschel & McLaughlin, 2000).

Children with ADHD often lack inhibition and therefore tend to be excessively restless, overactive, and easily aroused emotionally. Due to these behavioral excesses, children with ADHD require immediate, frequent, and predictable rewards. For example, when working on a long-term goal, children with ADHD require brief, repeated rewards, rather than a single, long-term reward (McNicholas, 2000).

Due to characteristics of impulsivity some children with ADHD exhibit, they may have difficulty making and keeping friends. Children with ADHD are not chosen as often by peers to be best friends or partners in activities (Goldstein & Goldstein, 1998). Children with ADHD also have a greater difficulty with transitions than children without ADHD. Children with ADHD have difficulty adapting their behavior to different transitions and situational demands (Shaywitz, Fletcher, & Shaywitz, 1997).

Subtypes

The Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition-

Text Revision (DSM-IV-TR; APA, 2000) currently identifies three subtypes of ADHD. ADHD, predominantly inattentive type (IN), should be used if six (or more) symptoms of inattention have persisted for at least 6 months. Examples of inattentive symptoms are: fails to give close attention to details, has difficulty sustaining attention in activities, does not listen when spoken to directly, does not follow through on instructions, loses things necessary for activities, is easily distracted by extraneous stimuli, and is forgetful in daily activities (APA).

Inattention may manifest in academic, occupational, or social situations. For example, children may fail to give close attention to instructions and make careless mistakes in schoolwork or other tasks. It may be difficult for the child to persist with tasks until completed. Children with the inattentive type of ADHD dislike and often avoid tasks requiring sustained concentration because they are not capable of attending for long periods of time. They also tend to be easily distracted by extraneous stimuli; therefore, they do not complete tasks promptly (Shaywitz et al., 1997).

ADHD, predominantly hyperactive-impulsive type (HI), should be used if six (or more) symptoms of hyperactivity-impulsivity have persisted for at least 6 months. Examples of hyperactive-impulsive symptoms include: fidgetiness, leaves seat when expected to remain seated, has difficulty playing quietly, acts as if “driven by a motor,” talks excessively, has difficulty taking turns, and interrupts or intrudes on others. Hyperactivity may manifest by excessive running or climbing in inappropriate situations. Impulsivity may manifest as impatience, a difficulty in delaying responses, and frequent interruptions or intrusion in conversation (APA, 2000).

The appropriate subtype for diagnosis should be based on the child's predominate symptom pattern over for the past 6 months. ADHD/combined type (Combined) should be used if six (or more) symptoms of inattention and six (or more) symptoms of hyperactivity-impulsivity have been present for the past 6 months (APA, 2000). Symptom patterns should be evaluated along with the child's behavioral developmental progression.

Developmental Progression of ADHD

Preschoolers. Symptoms of ADHD typically first appear in the preschool years. Characteristics of preschool children with ADHD include difficulty focusing, being on the go when playing or interacting with peers, not being able to sustain sitting for long periods of time, and restlessness. In addition, preschoolers with ADHD are often physically and verbally abusive to peers and teachers (McGoey, Eckert, & Dupaul, 2002).

It is difficult to diagnosis young children with ADHD because hyperactivity varies with the child's age and developmental level. Preschool children are naturally more active than older children and often exhibit defiance, high-activity levels, inattention, impulsivity, and temper tantrums. Given these behaviors, it can be difficult to determine what is abnormal and what is developmentally appropriate. Hyperactive, inattentive, and impulsive behaviors exhibited may be age-appropriate behaviors in active children rather than symptoms of ADHD.

The majority of measures developed to assess ADHD are not appropriate for preschoolers because they are not normed on this age group. The lack of

developmentally appropriate, objective measures combined with the limited understanding of developmentally inappropriate levels of activity, impulsivity, and inattention in preschoolers has contributed to limited progress on preschool assessment of ADHD (McGoey et al., 2002).

There are some data to suggest that preschool children are more likely to exhibit the Predominantly Hyperactive-Impulsive subtype of ADHD than the combined or inattentive subtype (Lahey et al., 1996). These results have led researchers to speculate that the hyperactive-impulsive subtype might be a developmental precursor of the combined subtype. According to McGoey et al. (2002), the *DSM-IV-TR* classification system of ADHD is likely to improve accurate identification of ADHD in preschoolers because it reveals that there is a difference in the manifestation of ADHD symptoms from preschool to school-age children.

Preschool children with ADHD are at an increased risk for school failure and later diagnosis of a disruptive behavior disorder due to the impulsive nature of their responses and actions in the classroom (McGoey et al., 2002). Preschool children with ADHD function best in a highly structured environment with specific directions.

Children. Although symptoms of ADHD usually first appear in early childhood, typically ADHD is not diagnosed until the elementary school years when learning difficulties and transitional adjustment are more parts of the child's routine. In classroom settings, children with ADHD may be more interested in tasks other than those the teacher is focusing on, are more restless in their seats, fidget, and become more distractible (Frick & Lahey, 1991). Additional symptoms children exhibit include

difficulty staying on-task during self-directed instruction, inability to attend to teacher instruction for a sustained amount of time, impulsivity, excessive talking with peers, inability to comply with simple instructions, and difficulty with transitions (Solanto et al., 2001). According to Lahey et al. (1996), school-age children exhibiting inattentive and combined subtype symptoms typically exhibited hyperactive-impulsive subtype symptoms in their preschool years. Although children may have exhibited hyperactive-impulsive subtype characteristics in preschool, this subtype becomes less common in children and adolescents.

Adolescence and adulthood. As the child matures, ADHD symptoms typically either change in nature or diminish in intensity. For example, excessive climbing or running may be internalized to inner restlessness or fidgetiness. Hyperactivity and impulsivity symptoms tend to decline at a higher rate than inattention symptoms in adolescents with ADHD (Biederman, Mick, & Faraone, 2000). Symptoms that become more predominant in adolescence include procrastination, disorganization, distractibility, restlessness, boredom, academic underachievement or failure, low self-esteem, and chronic tardiness or nonappearance. Symptoms of adolescents with ADHD may appear different than in younger children because adolescents typically apply coping strategies to accommodate for their deficiencies or excesses. At least 80% of children with ADHD continue to exhibit symptoms consistent with ADHD into adolescence (Goldstein & Goldstein, 1998). Between 20 and 45% of adolescents with ADHD will continue to exhibit ADHD symptoms into adulthood (Goldstein & Goldstein).

Comorbidity and Associated Features

There are high rates of comorbidity between ADHD and other disruptive behavior disorders. In addition to the primary symptoms of inattention, hyperactivity, and impulsivity, children with ADHD often experience other difficulties such as oppositional and defiant behavior, aggressiveness, and antisocial behaviors such as fighting, stealing, lying, and truancy (Gentschel & McLaughlin, 2000). Given their difficulties with these behaviors, children with ADHD are more likely to exhibit externalizing disorders such as oppositional defiant disorder (ODD) and conduct disorder (CD) than children without ADHD (Newcorn & Halperin, 1994).

Children with ADHD often show a severe pattern of conduct problems, which in turn increases disruptions at home, school, and with peers. Eventually these conduct problems place children with ADHD at risk for being diagnosed with CD in adolescence. Prevalence rates for ODD and CD among children with ADHD have been reported to be 30-50% (Milberger, Biederman, Faraone, Murphy, & Tsuang, 1995). Approximately 20-60% of adolescents with ADHD exhibit antisocial behavior (Shaywitz et al., 1997).

Adolescents with ADHD are also at a greater risk of developing internalizing disorders (Eiraldi, Power, & Nezu, 1997). Adolescents with ADHD may develop internalizing coping strategies to accommodate for their inattention, hyperactivity, or impulsivity (Goldstein & Goldstein, 1998). The comorbid internalizing disorders most often associated with ADHD are the anxiety disorders (Bird, Gould, & Staghezza, 1994). The rate of comorbid anxiety disorder for adolescents with ADHD is

approximately 20-70% (Goldstein & Goldstein).

Associated features of ADHD vary depending on the child's age and developmental stage. Some features commonly seen in younger children include low frustration tolerance, temper outbursts, bossiness, stubbornness, mood lability, excessive and frequent insistence on requests being met, rejection by peers, and poor self-esteem (APA, 2000). Features commonly seen in adolescents are similar to those in children and include inner restlessness, anxiety, irritable mood, difficulties with social relationships, and poor self-esteem (Shaywitz et al., 1997).

The primary symptom areas of inattention or hyperactivity-impulsivity may also impede the development of self-competence and self-worth (Solanto et al., 2001). It is not unusual for children with ADHD to have a poor self-concept and low self-esteem due to the high rate of negative feedback they receive from peers, parents, and teachers. Some children with hyperactivity elicit negative, harsh, and conflictual interactions with parents, teachers, and peers. Negative feedback increases the probability that children with ADHD will have difficulties in social relationships with parents, teachers, and peers (Gentschel & McLaughlin, 2000).

Children with ADHD often exhibit academic difficulties or academic underachievement in school. For example, they are more likely to perform below expectations in reading, and compared to their peers, are more likely to be behind in their academic subjects (Shaywitz et al., 1997). Specific learning disabilities occur more frequently in children with ADHD than in those without ADHD. Approximately 9-30% of children with ADHD have a comorbid learning disorder (Hechtman, 2000).

The primary symptoms of ADHD such as distractibility may exacerbate poor school performance and academic underachievement during childhood. Children with ADHD often underperform, however, may not underachieve during the elementary school years. It is not so much that children with ADHD do not know what to do, but that they do not do what they know consistently. By high school at least 80% of these children fall behind in core academic subjects (mathematics, reading), which require repetition or attention (Frick & Lahey, 1991).

Gender Issues

A higher prevalence of ADHD exists among males than females, with a ratio of 3:1 in community settings to 6:1 in clinic settings (Breen, 1999). In both clinic and community settings there is a distinct difference in the expression of behaviors among males and females. The higher rate of males among clinic samples compared to community samples seems to be due to the external nature of the behaviors displayed (Gaub & Carlson, 1997). Males are more likely than females to exhibit more externalizing symptoms such as aggressiveness, antisocial behavior, assertiveness, hyperactivity and exemplify visible disruptive behaviors that are more likely to get a child referred to a psychiatric setting (Brown, 2000).

Males with ADHD exhibit greater impairments in social conduct; whereas, females with ADHD exhibit greater cognitive impairments and academic difficulties. For example, females with hyperactivity tend to have lower intelligence quotient (IQ) scores, poorer academic performance, poorer language abilities, and significantly higher

rates of language and neurologic disorders when compared to males with hyperactivity (Arcia & Conners, 1996).

Clinic-referred females with ADHD are more socially withdrawn and have more internalizing symptoms (anxiety, low self-esteem, and depression) than males. The internalizing symptoms are typically identified later than externalizing symptoms because they are not as disruptive to parents and teachers (Brown, Madan-Swain, & Baldwin, 1991).

There also seems to be differences in the social impairments exhibited by males and females with ADHD. Males with ADHD exhibit significantly greater social impairments at school through fights and having problems with teachers. Females with ADHD have global and specific interpersonal deficits relating to relationships at school and with peers, parents, and siblings. Females with ADHD have difficulty interacting with peers and clearly expressing their feelings when compared to females without ADHD (Greene et al., 2001).

Treatment

Given the significant problems experienced by children with ADHD, diagnosis and appropriate treatment is important. Currently there are a variety of treatment methods available to children diagnosed with ADHD. However, only two treatment methods, behavior management and medication, are empirically supported. Different components of each treatment model may be altered to fit the needs of the child and family. The optimal management of children with ADHD requires a multifaceted and

long-term treatment approach (Frazier & Merrell, 1997).

Behavior management programs focus on assessing the child's excessive or deficient behavior, and using reinforcement and punishment to increase/decrease positive and negative behaviors. In parent training programs, parents are taught to praise and reward appropriate behavior, ignore minor inappropriate behavior, implement time out for serious negative behavior, establish and monitor point/token systems, give clear commands, and shape appropriate behavior by reinforcing successive approximations to target behavior (Pelham, 2001).

Educational interventions and alterations to the classroom environment such as the pace, presentation style, or level of instruction may be provided for children with ADHD (Brown, 2000). Accommodations for children with ADHD range from a different seat placement in class to in-class behavior modification programs for inattentiveness, hyperactivity, and impulsivity. For example, the teacher may monitor the child's on-task behavior and the child would receive points based upon his/her positive behaviors.

Psychosocial treatment has been found to be acceptable to use with those children with ADHD who wish to avoid stimulant medication. Psychosocial treatment has been found to alleviate many secondary symptoms of ADHD such as low self-esteem, oppositional behavior, and conduct problems that may result from the core symptoms of ADHD (Conners, March, Frances, Wells, & Ross, 2001).

Medication is often used for children with ADHD. Medications often prescribed include psychostimulants such as Ritalin and Adderall. Positive behavior effects from

medications include the enhancement of attention, reduction of impulsiveness and overactivity, diminished oppositional and aggressive behavior, and decreased irritability (Goldman, Genel, Bezman, & Slanetz, 1998). Stimulant medication also improves “on task” behavior, the child’s ability to complete academic tasks, and social interactions with peers, parents, and teachers (Zametkin & Ernst, 1999). A response rate of approximately 70% has been found with most stimulant medications (Goldman et al.).

A combination intervention consisting of pharmacotherapy and behavior therapy is often considered the treatment of choice for ADHD (Frazier & Merrell, 1997). According to the National Institute of Mental Health-sponsored Multimodal Treatment Study of ADHD (MTA), medication alone was found to be significantly more effective for the core symptoms of ADHD as compared to behavioral treatment alone (MTA Cooperative Group, 1999a). Children receiving behavioral interventions also exhibited decreased ADHD symptoms but not to the extent of those on medication. However, medication has not been shown to improve the long-term outcome for classroom behavior, learning, or impulsivity (Goldman et al., 1998). Medication management may be more effective when paired with behavioral treatment because it may provide relief to families in coping with the child’s disorder. The MTA study found that medication is approximately equal to a combined treatment; however, a combination treatment may allow lower medication dosages to be used. Combination treatment may provide modest advantages for non-ADHD symptoms, which are comorbid with ADHD, such as poor self-esteem, anxiety, anger, and poor peer relations. Combination treatment

may also lead to positive behavioral, emotional, and social functioning outcomes (MTA Cooperative Group, 1999b).

There are effective treatments available for children with ADHD; however, for these to be implemented children must be properly assessed and diagnosed with ADHD. It is important to utilize psychometrically sound measures when assessing the behavior of a child suspected with ADHD.

Assessment

A variety of assessment methods are used in the ADHD diagnostic process. The assessment should determine whether the child displays behaviors characteristic of ADHD at developmentally inappropriate and problematic levels. In assessing symptoms, it is important to be aware of normal age-related developments in children's ability to pay attention, inhibit impulses, and control restlessness. It is imperative to assess children in relation to other children of their own age and/or developmental level (Zametkin & Ernst, 1999). Therefore, the use of measures with normative data will allow the assessor to determine if the behaviors observed deviate from what would be expected from other children of a similar age. When conducting an assessment, multiple methods and sources of information are collected in various settings. A multimethod approach is used based on the idea that multiple informants contribute different information about the child's behavior (Barkley, 1998).

Interviews

A clinical interview is the most widely used method in the assessment process

because it allows for coverage of a broad range of topics (Brown, 2000). The assessor should obtain a description of the onset, development, and pervasiveness of symptoms from the child, parents, and teachers. Parents can provide information about their child's behavior in the home setting, as well as information about their discipline styles. Teacher interviews provide additional information about the child's symptoms, as well as information specific to the school setting such as social behavior with peers and academic performance. Children may be able to provide information about their perceived strengths and weaknesses. It is difficult for children with ADHD to accurately judge their own behavior. However, knowing how the child perceives his/her behavior may be helpful to the evaluator.

Psychological and Psychoeducational Assessment

Psychological and psychoeducational measures are used to assess general intelligence and academic achievement. Neuropsychological tests, such as the Matching Familiar Figure Test (MFFT) or the paired associate learning task may also be used (McNicholas, 2000). Some researchers believe that standardized measures of attention and impulsivity, such as continuous performance tests (CPT), are useful in assessing a child's level of distractibility and inattention (Kronenberger & Meyer, 1996). Other researchers have concluded that CPTs do not reliably discriminate children with ADHD from children without ADHD. According to DuPaul, Anastopoulos, Shelton, Guevremont, and Metevia (1992), there are many limitations when using CPTs, including a lack of significant correlations with other measures of

ADHD, and an inability of scores on the CPTs to discriminate between children with varying clinical diagnoses. Scores on the CPT and MFFT do appear to discriminate between children with ADHD and children without ADHD at a group level, however the utility of these measures in assessing individual children is limited. The validity of most clinic tests, including the MFFT and CPTs for the purpose of assessing ADHD, has been found to be low to moderate (DuPaul et al.).

Behavioral Observations

Behavioral observations typically involve observing the child within the classroom participating in academic or social tasks (Brown, 2000). Many children with ADHD have difficulties with noncompliance, and with completing assigned tasks. They may display oppositional, deviant, or inattentive/off-task behavior. Observations within the child's classroom may give the assessor information about the expectations teachers may have of their students, and an idea of how the classroom functions.

Informal observations of the child's interaction with his/her parents and other adults can also provide valuable information. Such observations may give the assessor information about the expectations parents may have for their child, effective usage of commands, and the relationship the parent has with his/her child. Advantages of behavioral observations are that they can be conducted in the child's natural environment and may be more objective than behavior rating scales, psychoeducational measures, and interviews (Barkley, 1998). Disadvantages include the amount of time required to complete observations, and the inconsistency of behavior observed. The behavior observed may not be representative of the child's behaviors in general due to

the child reacting to the observer's presence and altering his/her behavior (Brown, 2000). Therefore, obtaining samples of behavior in various settings provides a more reliable indicator of overall behavior.

Behavior Rating Scales

Behavior rating scales can provide reliable and objective information in the ADHD assessment process (Brown, 2000). They provide an objective way to assess situational behavior characteristics and help the evaluator determine the severity of the behavior or impairment of functioning. Behavior rating measures can be given to the child, parents, and teachers to complete. Associated features and comorbid disorders are also often assessed including oppositional and conduct disorder tendencies, social skills, and academic difficulties.

Most behavior rating scales are norm-referenced. Thus, they can be used to evaluate the severity of a child's symptomatology in comparison with peers of a similar age and gender (Power et al., 1998). Behavior rating scales are relatively inexpensive and easy to administer. Advantages to broad-band rating scales include that most rating scales include a substantial number of items covering a broad range of potentially relevant problems, and items are placed into empirically derived scales that often aid in the assessment of comorbid problems (Elliot & Busse, 1993). Behavior rating scales assess current or recent functioning, however they do not provide information regarding the etiology of the problems. In addition, behavior-rating scales involve the raters' perceptions of a child's problems rather than an objective measure of the problem.

Diagnostic Utility of Behavior Rating Scales

Behavior rating scales are often used in the diagnostic evaluation of ADHD; however research on the clinical utility of these measures is limited (Power et al., 1998). To determine the validity of rating scales the diagnostic utility of the measure needs to be assessed. The diagnostic utility of a measure is assessed by the usefulness of the measure in assessing a construct, appropriateness of scale format for informants, usefulness of norms for the intended purposes, and the utility of the interpretation for the situation.

Characteristics of a behavior rating scale with diagnostic utility include the items being readable, having a sufficient number of items to assess the construct, and answers that indicate the severity of the problem. It is important for a measure to have the ability to identify specific constructs, discriminate between clinical and normative samples with regards to the construct under consideration, and be able to predict future symptoms within samples (Weiler et al., 2000). It is important to develop and use reliable and valid scales to assess ADHD as well as other emotional and behavioral disorders so that children are accurately identified.

Types of Behavior Rating Scales

Behavior rating scales include both broad-band and narrow-band scales. Broad-band rating scales measure a number of behavioral constructs. Examples of commonly used broad-band measures include the Child Behavior Checklist (CBCL), Teacher's Report Form (TRF), Devereux Behavior Rating Scale-School Form: Child and

Adolescent Versions, and Behavior Assessment System for Children (BASC).

Additional broad-band measures used for adolescents include the Youth Self-Report (YSR), and BASC-Self Report.

The Child Behavior Checklist (CBCL) is a standardized questionnaire commonly used in the assessment of children, ages 4-18, with emotional and behavioral difficulties. It is the most frequently used broad-band measure used in research (Anastopoulos & Shelton, 2001). It is composed of 112 items that each significantly differentiates clinically referred from nonreferred children. The items of the CBCL are factor analyzed to identify the forms of psychopathology that occur in children (Achenbach & Rescorla, 2001).

According to Biederman et al. (2001) the CBCL is “one of the best-studied examples of a psychometrically sound checklist to measure psychopathology” (p. 492). Achenbach and Rescorla (2001) assessed the psychometric properties of the CBCL. Results indicate the internal consistency across scales was 0.78-.97. Test-retest reliability of parent ratings was 0.95-1.00. Some differences were found between mothers’ and fathers’ individual ratings.

Several studies have supported the construct validity of this instrument. For example, tests of criterion-related validity using clinical status as the criterion (referred/nonreferred) also support the validity of the instrument (Achenbach & Rescorla, 2001). The CBCL has been shown to have high convergence with diagnoses based on the DSM, including the CBCL Attention Problems scale and the *DSM* diagnosis of ADHD (Biederman et al., 2001). To further increase the validity of

assessment, the parent-rated CBCL can be used in conjunction with its counterparts, the TRF and the YSR (Achenbach & Rescorla).

The BASC is a measure that assesses the behaviors, thoughts, and emotions of children and adolescents. It focuses on both adaptive and maladaptive behaviors, in school, home, and community settings. Behaviors assessed include aggression, anxiety, attention problems, atypicality, conduct problems, depression, hyperactivity, withdrawal, somatization, and social skills. The BASC consists of a self-report scale, teacher rating scale, and parent rating scale. The following information is based upon data collected from 2,084 parents of children ages 6-11 (Reynolds & Kamphaus, 1992). Results from this study indicate the internal consistency of subscales ranged from 0.80-.90. Test-retest reliability was 0.88. Inter-rater reliability between parent and teacher averaged 0.57. As reported in the manual (Reynolds & Kamphaus, 1992), the internal consistency of subscales ranged from .62-.95. Test-retest reliability was .76-.78. Interrater reliability between teachers averaged .63-.83. In addition, the BASC correlates highly with the CBCL and Conners' Rating Scales. Ostrander, Weinfurt, Yarnold, and August (1998) found that 88% children were correctly identified as ADHD by using the attention subscale on the BASC.

Narrow-band scales measure a single, specific construct. Narrow-band scales are frequently administered with a broad-band scale if ADHD is suspected (Brown, 2000). Examples of narrow-band measures used in the assessment process of ADHD include the Conner's Parent and Teacher Rating scales, the ADHD Rating Scale-IV, the Attention Deficit Disorders Evaluation Scale-Second Edition (ADDES), Disruptive

Behavior Disorders Rating Scale, and the ADHD Symptoms Rating Scale (ADHD-SRS). Narrow-band self-report measures completed by adolescents include the Brown Attention-Deficit Disorder Scales (ADDS), and the Connors' Rating Scales: Self-Report Forms for Adolescents (CASS:I).

The ADHD Rating Scale-IV (DuPaul, Power, Anastopoulos, & Reid, 1998) is an 18-item rating scale used to assess ADHD symptoms as listed in the *DSM-IV*. The measure was normed on parent and teacher ratings of more than 2,000 children and youth ages 5-18, and has been found to have good psychometric properties. The ADHD Symptoms Rating Scale (Holland, Gimpel, & Merrell, 2001) is another behavior rating scale designed for use in evaluating ADHD symptoms in children and adolescents. The measure consists of 56-items, and was normed on parent and teacher ratings of nearly 3,000 children and youth ages 5-18. Like items on the ADHD-IV, the items of the ADHD-SRS are based on the diagnostic criteria for ADHD from the *DSM-IV*. Psychometric properties of the ADHD-SRS are strong. Internal consistency estimates are .99 for home raters. The validity of the ADHD-SRS is supported through moderate to high correlations with similar measures such as the ADDES (home and school versions), Connors' Rating Scales, and the ADHD Rating Scale-IV.

The ADDES-2nd edition (McCarney, 1995) consists of two versions, home and school. The home version, a 46-item scale, and school version, a 60-item scale, is used to evaluate and diagnose ADHD in children and youth. The measure was normed on parent and teacher ratings of more than 5,000 students ages 4-18. The psychometric properties of this measure are good. Internal consistency estimates are .95 for home

raters, and .90 for school raters. The validity of the ADDES 2nd edition, home and school versions, is supported through moderate correlations with other measures.

One of the most widely used ADHD behavior rating scale systems is the Conners' Rating Scales—Revised (Conners, 1997). This measure consists of parent and teacher versions including brief and expanded forms, and has been normed on several thousand children and adolescents ages 3-17. The psychometric properties of this measure are also good. Internal consistency estimates are .92 for home raters, and .94 for school raters. The validity of the Conners' Rating Scales-Revised is supported through correlations with other measures of ADHD.

Self-Report Rating Scales

When conducting evaluations, information is typically obtained from the child through an interview or self-report measures not specific to ADHD. Self-report measures are completed by the child and are used to assess a child's perspective of his/her behavior. Broadband and narrow-band self-report measures are used to assess the child's current level of psychosocial functioning and target possible difficulties. Examples of broadband self report measures used include the BASC, Conners-Wells' Self-Report Scales, and YSR. Examples of narrow-band self-report measures include the Social Skills Rating Scale (SSRS), Revised Children's Manifest Anxiety Scale (RCMAS), Reynold's Child Depression Scale (RCDS), Internalizing Symptom Scale for Children (ISSC), and the Multidimensional Anxiety Scale for Children (MASC).

Historically, the perspective of the child has not been taken into consideration by way of a self-report measure in ADHD evaluations. This may be due to the child's

lack of cognitive development (Hope et al., 1999). There are also concerns regarding the validity of child self-report measures. Children may not be able to self-report their behaviors accurately because they lack insight into problems, or do not see their behaviors as problems. In general, children report fewer externalizing symptoms and more internalizing symptoms than adults report for them (Volpe, DuPaul, Loney, & Salisbury, 1999). Volpe et al. showed that fewer children self-identify symptoms of ADHD via a *DSM*-based child interview than parents identify on a rating scale.

Other concerns regarding the validity of child self-report measures include children “overendorsing” symptoms when completing measures, underidentifying problems, and distorting their perceptions of situations. Volpe et al. (1999), found that children who self-identify as having ADHD tended to “overendorse” when given an opportunity to report symptomatology in a *DSM*-based child interview.

Hoza, Pelham, Milich, Pillow, and McBride (1993) found that boys with ADHD tended to distort their perceptions of events to their advantage. In a study conducted to determine the utility of children, mothers, and teachers as informants in assessing ADHD, results indicated that children were the least useful informants because their ratings did not predict their eventual diagnosis (Crystal, Ostrander, Chen, & August, 2001).

Concerns regarding the validity of adolescent self-report measures include the changing relationship between adolescents and their parents and teachers. Adolescents spend less time with teachers and parents, and more time with their peers, this giving adults limited or insufficient opportunities to observe target behaviors (Adams,

Reynolds, Perez, Powers, & Kelley, 1998).

Panter (1996) reported that on the YSR adolescents in a clinical sample rated themselves higher on externalizing dimensions than adolescents in a normative group. This may indicate a degree of self-awareness. Therefore, this study shows that an important, yet often neglected source of information for diagnosing ADHD in adolescents may be available when using self-report measures. However, there is evidence that children's self-reports improve with age, and that the validity of adolescent self-report measures is higher than children's self-reports. Children may not have the same level of self-awareness of their behavior due to their cognitive abilities (Volpe et al., 1999).

Obtaining children's self-reports of their behavior may provide important data, such as a child's self-awareness and perception of his/her behavior. According to Volpe et al. (1999), to form a comprehensive picture of a child's dysfunction it is important to obtain information from a number of informants, including the child. Self-report data, such as possible distractors within the classroom or home, may provide information about symptoms that are not readily apparent to others (Quarto, 1997).

A new adaptation of the Brown Attention-Deficit Disorder Scale (ADDS) self-report form (children ages 8-12) is available. Reviewing the literature, the ADDS is the only published child ADHD self-report measure. There is also an adolescent version of the Brown Attention-Deficit Disorder Scale (ADDS) self-report for individuals ages 12-18 years. The child version measures difficulties in six clusters: organizing, prioritizing and activating to work; focusing, sustaining and shifting attention to tasks;

regulating alertness, sustaining effort and processing speed; managing frustration and modulating emotions; utilizing working memory and accessing recall; and monitoring and self-regulating action. The adolescent version measures difficulties in five clusters. These are the same as those on the child version with the exception of the last cluster.

Brown (2001) assessed the psychometric properties of the ADDS. Measures of internal consistency for self-report raters ages 8-12 in the standardization, clinical, and the total sample across all subscales were between .71-.84. Alpha coefficients for Total scores ranged from .92-.96. Reliability estimates across the two samples (comparison and clinical) were also high for parent raters (.95 to .98), and school raters (.95-.98). Internal consistency for adolescents ages 12-17 in the standardization, clinical, and the total sample across all subscales was moderately high (.70 to .89). Alpha coefficients for Total Scores ranged from .90 to .95. The ADDS Parent and Teacher Rating Scales correlate well with other measures.

Conners (1997) assessed the psychometric properties of the CASS, a self-report measure of ADHD and associated features in adolescents. Results from this study indicate that adolescents with ADHD consistently report a significantly higher level of ADHD symptoms than do their peers. The psychometric properties of this measure are moderate to high. Internal consistency estimates range from .73-.94.

A variety of self-report measures exist for assessing ADHD in adolescents. These measures reflect good psychometric properties, indicating adolescent self-report measures are valid assessment tools to use. There is a lack of child measures available

in the assessment of ADHD. Currently there is one child self-report measure available, with good psychometric properties.

Boatwright-Bracken Child Attention Deficit Scales

Recently a new ADHD rating scale, which includes a child self-report, teacher rating form, and parent rating form, the Boatwright-Bracken Child Attention Deficit Scale, has been developed. This scale is intended to measure ADHD symptoms in children ages 8-18. The BCADS-Child can be completed by the child at home or school. The BCADS-Parent is completed by the parent at home, school, or in a professional's office (B. Bracken, personal communication, January 13, 2003).

The items on the BCADS-Child and Parent versions were adapted from a current adult self-report measure of ADHD. The adult self-report examines the three diagnostic subtypes of ADHD from the *DSM-IV*, as well as the adult's social, personal, and academic functioning. Some of the items on this adult measure were modified to be more appropriate for children. For example, reference is made to academic tasks rather than work-related tasks (B. Bracken, personal communication, April 10, 2002).

The BCADS was created with a theoretical orientation that includes multiple behavior/clinical domains (inattention, hyperactivity, impulsivity), contexts (social, school, personal), and levels (external, internal). The three subscales (inattention, hyperactivity, and impulsivity) assess functioning within the following life contexts: personal life, school/work, and social life. Items within the scales were designed to measure internal (feelings, attitudes), and external (exhibited behaviors) experiences.

According to the scale author, these domains, contexts, and levels will hopefully allow psychologists to not only diagnose ADHD more easily, but will also help assess which life contexts are most affected, and the extent to which the child acts out his/her disorder (external) and feels the disorder (internal; B. Bracken, personal communication, January 13, 2003).

If valid, the BCADS will be an additional assessment tool that can be used in the assessment of ADHD. Currently there is some preliminary psychometric information on this scale, however more data are needed to determine the reliability and validity of the scale.

Panter (1996) conducted the only known study to date on the psychometric properties of the BCADS. She used both the ADDES and mothers' and fathers' self ratings on the Boatwright-Bracken Adult-ADHD Scale (BAADS; Boatwright & Bracken, 1995) as comparison measures. The clinical sample consisted of 25 children with ADHD and their parents. The comparison sample consisted of 25 children without an ADHD diagnosis and their parents.

Panter (1996) compared mother, father, teacher, and child ratings on the BCADS to determine which raters best discriminated between those children with ADHD and those without ADHD. All raters discriminated children with ADHD from those without ADHD. When using the three subscale scores, 66.67% of the subjects were correctly classified as ADHD or non-ADHD by father reports. Using mother reports 88% of the subjects were correctly classified as ADHD or non-ADHD. Teacher reports correctly classified 83.72% of the subjects as ADHD or non-ADHD, and

81.25% of the subjects were correctly classified as ADHD or non-ADHD using child self reports. This indicates that these children were able to accurately rate their own behaviors (Panter, 1996).

Independent *t* tests were used for mother, father, and teacher ADDES Total Test scores to determine whether the ADDES discriminated children with ADHD from those without ADHD. There were significant differences between the ADHD and non-ADHD groups. The total scores of the ADDES and BCADS correlated significantly between raters and scales indicating the two scales produced similarity between scales and raters.

For the entire sample, mothers' current symptoms as reported on the BAADS best predicted the ratings of their children on the BCADS-Parent. Fathers' BAADS score predicted ratings of the children on the fathers' BCADS-Parent scales. This pattern indicates that there may be an associated familial behavioral pattern.

Interrater reliability of the BCADS was also evaluated by Panter (1996). Agreement between mother-father and mother-teacher ratings was moderate to high (.57 to .75). Agreement between father-teacher ratings was moderate (.37 to .64). Agreement between teacher-child ratings (.49 to .74) and parent-child ratings (.55 to .74) was moderate. According to Bracken, the pilot data presented in Panter's research shows "better than typical" psychometric qualities for child self-report measures (B. Bracken, personal communication, January 13, 2003).

Psychometric Properties

It is important to use behavior-rating scales with good psychometric properties.

Often rating scales are the primary assessment tools used to diagnose ADHD, and to evaluate, treatment progression. Therefore, clinicians must have confidence that the scale measures what it purports to measure and that it does so with acceptable error (Streiner, 1993). Internal consistency reliability, test-retest reliability, equivalent form reliability, cross-informant agreement, discriminant validity, concurrent validity, and construct validity should be evaluated.

Reliability is defined as “measurements of individuals on different occasions, or by different observers, or by similar or parallel tests, produce the same or similar results” (Streiner, 1993, p. 142). A test is reliable to the extent that whatever it measures, it measures consistently. The reliability of most behavior ratings scales is assessed by measuring the internal consistency and test-retest reliability. Internal consistency estimates the test score reliability by examining the extent to which individuals respond similarly to items on the measure (Gall, Borg, & Gall, 1996). The more items a measure has, the more reliable it tends to be. A minimum reliability of .70 for research, and .80 for clinical purposes are cited as ideal levels for internal consistency (Anastasi, 1988). Test-retest reliability measures consistency from one time to the next. Test-retest reliability may vary, especially with rating scales, because closer time intervals typically lead to higher reliability, however even over longer time periods measures of chronic conditions, like ADHD, should be high (Corcoran & Fischer, 2000).

Validity is defined as the “appropriateness, meaningfulness, and usefulness of the specific inferences made from test scores” (Gall et al., 1996, p. 196). Validity refers

to whether the construct being measured is actually assessed by the measure. Construct validity assesses whether the scale actually measures what it purports to measure (Anastasi, 1988). Construct validity is often assessed by looking at a measure's convergent and discriminant validity. A measure that has a high correlation with other like measures is said to have high convergent validity. Discriminant validity is the extent to which a measure is able to discriminate between two samples, and whether it correlates highly with like measures and lowly with unlike measures.

Concurrent validity examines the extent to which individuals' scores on a new measure correspond to their scores on a similar measure assessing the same construct (Gall et al., 1996). Therefore, when scores on a new measure correlate well with scores on another measure that is already considered valid, the new measure is considered to have adequate concurrent validity.

It is also important to determine the sensitivity and specificity of rating scales. Sensitivity refers to the likelihood that a child who has a disorder will exhibit a particular profile of clinically significant symptoms on the measure. It is also defined as how effective the measure is in assessing true cases of a disorder. Specificity refers to the probability that a child who does not have a disorder will not exhibit a profile of clinically significant symptoms (Anastasi, 1988).

Cross-Informant Agreement

Cross-informant agreement is an estimate of the consistency between different raters' responses. A high level of cross-informant agreement is the result of raters having similar interpretations of scale items and the child's behavior. Cross-informant

reliability varies significantly in degree, and is influenced by situational factors and raters' perceptions (Elliot & Busse, 1993).

In order to accurately assess a child with ADHD it is pertinent to assess the cross-situationality of symptoms by using multiple informants. Many behaviors are situationally specific; therefore, multiple informants may perceive the child's behavior differently. In general, agreement on ADHD symptoms between parents and teachers is low to moderate (Mitsis, McKay, Schulz, Newcorn, & Halperin, 2000). Typically parent-teacher informants demonstrate an agreement level no higher than 0.30 (Brown, 2000). Parent-child and teacher-child informants demonstrate an agreement level of .22 (Achenbach, McConaughy, & Howell, 1987). Agreement between pairs of informants (two parents, two teachers) participating in a similar context with the child may reach an agreement level of .60, but it is not typical (Elliott & Busse, 1993).

Factors that may contribute to informant discrepancies include one-to-one versus group situations, father versus mother ratings, novelty versus familiarity of setting, high versus low salience of consequences, time of day, and level of supervision (Barkley, 1998). There are also differences in a child's behavioral expectations between parents and teachers. Teacher's perceptions of a child's behavior are often significantly correlated with classroom observational data. Parents provide information regarding behavior within the home rather than information about their child's behavior at school. Parents may underidentify ADHD symptoms at school, and their ratings are correlated primarily with their own perceptions of their child's behavior at home.

Another hypothesis as to why there is a discrepancy among parent and teacher

ratings is that teachers have a greater familiarity with age-appropriate norms. For example, a parent may not be aware of the difference between appropriate and inappropriate behavior because they do not have other children to compare their child to and may, therefore, rate their child as having more problems than the child's teacher indicates. Teachers have frequent contact with the child and base their judgments on numerous observations of the child's behavior in the natural environment in comparison to the child's peers (Atkins & Pelham, 1991).

Rater differences do not necessarily invalidate assessment results. Differences may provide useful information about each informant's tolerance of symptoms, the impact of a child's behavior on the informant, or behavioral specificity across environments (Hale, How, Dewitt, & Coury, 2001). Therefore, the use of parent and teacher reports increases case identification and increases diagnosis accuracy (Mitsis et al, 2000).

Conclusion

ADHD is one of the most frequent reasons children are referred to school psychologists or mental health clinics. Common symptoms of ADHD include hyperactivity, impulsivity, difficulty attending to tasks for long periods of time, noncompliance, and difficulty associating consequences with behavior. ADHD in children is more prevalent in boys than girls. Characteristics of ADHD may affect academic, social and job performance. Some children with ADHD exhibit comorbid disorders, such as ODD, CD, or mood disorders.

Currently, the assessment process for ADHD includes behavior-rating scales completed by parents and teachers, behavior observations, and interviews. Information may be obtained directly from the child through an interview or broad-band measures, however a self-report of ADHD symptoms has typically not been incorporated.

A new rating scale for ADHD, the BCADS, which has a self-report (BCADS-Child), teacher version (BCADS-Teacher), and parent version (BCADS-Parent) has been recently developed. However, the psychometric properties of this measure have not yet been fully investigated. Consequently, there is a need to investigate the reliability and validity of this measure for the purpose of using it in the ADHD diagnostic process. The purpose of this research project is to examine the psychometric properties of the BCADS-Child and BCADS-Parent.

CHAPTER III

METHODS

Participants

The desired minimum sample was 100 children, ages 8-12, 70 without a diagnosis of ADHD and 30 diagnosed with ADHD. The target sampling population included children within this age range who fit the study inclusion criteria (outlined below). The clinical sample size was determined by the availability of children fitting the criteria within the investigator's data collection area. The comparison sample size was determined by the typical expected return rate for parents within the participating school district. Also, the sample sizes were deemed adequate for comparisons and calculations of reliability and validity in this study. Children in the comparison (non-ADHD) sample were recruited through two elementary schools in Utah County. Children in the clinical sample (diagnosed with ADHD) were recruited from ongoing research studies at Utah State University, one Utah County CHADD chapter, Utah State University's Center for Persons with Disabilities, and from psychologists within Nebo School District.

The obtained sample included 66 children, ages 8-12, without a diagnosis of ADHD and 27 children, ages 8-12, diagnosed with ADHD. The comparison sample consisted of 31 boys and 35 girls in Grades 2 to 7. The mean age of children was 8 years old, and the majority of participants were Caucasian. The majority (83.3%) of parents of the comparison sample children reported completing at least some college.

Mothers most frequently completed the rating scales (95.5%), and most children rated came from two-parent homes.

The clinical sample included children with a diagnosis of ADHD from a physician, psychiatrist, or psychologist. There were 26 boys and 1 girl in Grades 2 to 7 in this sample. The prevalence of males to females in the sample is reflective of the higher incidence of ADHD among males. The mean age of children was 9 years old, and the majority of participants were Caucasian. Of the participants with ADHD, 59.3% were taking prescription medication for their ADHD, 18.5% of the participants were taking prescription medication as well as receiving behavior therapy from a psychologist, 7.4% were only receiving behavior therapy, 7.4% were not receiving any treatment, and 7.4% did not indicate treatment. Nine of the children were diagnosed with an additional behavioral or mental health disorder. As with the normative sample, most parents of children with ADHD had completed at least some college and most children were living in two-parent households. Mothers, again, were the most common respondent. See Table 1 for complete demographic information.

Measures

The Boatwright-Bracken Child Attention Deficit Scale (BCADS) is intended to measure ADHD symptoms in children ages 8-18. Measures available include the BCADS-Child Self Report, BCADS-Parent, and BCADS-Teacher, which all contain 54 items. Because these instruments have been recently developed, the psychometric properties have not yet been fully investigated. This project specifically examined the

Table 1

Demographic Characteristics of Clinical, Comparison, and Total Samples

Demographic characteristics	Clinical (N = 27)		Comparison (N = 66)		Total (N = 93)	
	n	%	n	%	n	%
Parent completing sheet						
Mother	24	88.9	63	95.5	87	93.5
Father	1	3.7	1	1.5	2	2.2
Legal guardian	2	7.4	2	3.0	4	4.3
Highest level of education						
Did not complete high school	1	3.7	1	1.5	2	2.2
Completed high school	4	14.8	10	15.2	14	15.1
Completed some college	17	63.0	29	43.9	46	49.5
Completed college	4	14.8	22	33.3	26	28.0
Completed graduate/postgraduate	1	3.7	4	6.1	5	5.3
Marital status						
Married	21	77.8	60	90.9	81	87.1
Separated/divorced	6	22.2	6	9.1	12	12.9
Age						
8	7	25.9	15	22.7	22	23.7
9	5	18.5	17	25.8	22	23.7
10	6	22.2	21	31.8	27	29.0
11	5	18.5	10	15.2	15	16.1
12	4	14.9	3	4.5	7	7.5
Grade level						
2	5	18.5	4	6.1	9	9.7
3	5	18.5	18	27.3	23	24.7
4	5	18.5	17	25.8	22	22.6
5	7	25.9	20	30.3	27	29.0
6	4	14.8	6	9.1	10	10.8
7	1	3.7	1	1.5	2	3.2
Gender						
Male	26	96.3	31	47.0	57	61.3
Female	1	3.7	35	53.0	36	38.7

(table continues)

Demographic characteristics	Clinical (N = 27)		Comparison (N = 66)		Total (N = 93)	
	n	%	n	%	n	%
Ethnicity						
Latino	1	3.7	0	0	1	1.1
Asian	0	0	0	0	0	0
African American	0	0	0	0	0	0
Native American	0	0	1	1.5	1	1.1
Caucasian	26	96.3	64	97.0	90	96.7
Other	0	0	1	1.5	1	1.1
Comorbid diagnosis						
Yes	10	37.0	5	7.6	15	16.1
No	17	63.0	61	92.4	78	83.9
Type of comorbid diagnosis						
Learning disorder	0	0	5	7.6	5	5.4
Developmentally delayed	1	3.7	0	0	1	1.1
Oppositional defiant disorder	1	3.7	0	0	1	1.1
Obsessive compulsive disorder	1	3.7	0	0	1	1.1
Bipolar	1	3.7	0	0	1	1.1
Anxiety	2	7.4	0	0	2	2.2
OCD, anxiety, CAPD	1	3.7	0	0	1	1.1
ODD and depression	1	3.7	0	0	1	1.1
Other	2	3.7	0	0	2	2.2
Type of treatment						
Medication	16	59.3	0	0	16	17.1
No treatment	2	7.4	66	100	68	73.1
Medication and behavior therapy	5	18.5	0	0	5	5.4
Behavior therapy only	2	7.4	0	0	2	2.2
Don't know	2	7.4	0	0	2	2.2

examined the psychometric properties of the BCADS-Child. To validate the diagnostic reliability of the BCADS-Child, the BCADS-Parent and ADHD-SRS were concurrently administered and assessed as comparison measures. Background information regarding the BCADS is provided in the literature review.

The ADHD-SRS (Holland et al., 2001) is a standardized, norm-referenced rating

scale that measures behaviors symptomatic of ADHD in children and adolescents ages 5-18 years. The ADHD-SRS consists of 56 items designed to assess ADHD characteristics. The ADHD-SRS is completed by either a home rater, which most often is a parent, or by a school rater, which is typically the child's classroom teacher. Parents and teachers rate children on each item on a 0- to 4-point scale, with 0 indicating "behavior does not occur/no knowledge of behavior" and 4 indicating the behavior is exhibited "one to several times an hour."

A total score as well as two subscale scores (hyperactive-impulsive and inattentive) are obtained. Children who score in the 95th and above percentile are in the high-risk range, indicating that according to their parent they are exhibiting clinically significant levels of ADHD symptoms. Children who score in the 85th to 94th percentile are in the at-risk range, indicating that according to their parent or teacher they are exhibiting borderline levels of ADHD symptoms. Children who score in the 25th to 84th percentile are in the normal range, indicating that according to their parent they are exhibiting normal behaviors in comparison to their peers. Children who score in the 24th and below percentile are in the low risk range, indicating that according to their parent they are exhibiting few, if any, ADHD symptoms. The risk levels were based on commonly accepted prevalence rates of ADHD among the school age population.

The ADHD-SRS was normed on a representative sample of more than 2,800 children and adolescents aged 5-18 years. Norms are available based on the type of rater, as well as the age and gender of the child. Psychometric properties of the ADHD-SRS are strong. Internal consistency estimates are .99 for home raters. The validity of

the ADHD-SRS is supported through moderate to high correlations with similar measures such as the Attention Deficit Disorders Evaluation Scales (home and school versions), the Conners' Rating Scales, and the ADHD Rating Scale-IV. In addition, significant differences were found between ADHD and non-ADHD samples, which confirm the clinical validity of ADHD-SRS. Due to the strong psychometric properties of the ADHD-SRS, it was chosen to be used as a comparison measure in this study.

In addition to these measures of ADHD, parent participants received a parent letter (Appendix A), consented to participation in the study (Appendix B), and completed a demographic information form (Appendix C) intended to gather data on their child's gender, age, ethnicity, and mental health history as well as their own education level and marital status.

Procedures

Data for the normative sample were obtained from children in area elementary schools. Permission from the school district, principals, and teachers was obtained before contacting students and parents, requesting their participation in the study. Once this permission was granted, a cover letter explaining the purpose of the study, as well as a packet containing a consent form, demographic form, ADHD-SRS, BCADS-Child, and BCADS-Parent, was sent home with all third through fifth grade students attending the elementary schools that participated in this project.

Parents who wished to participate were requested to return the completed forms within two weeks. After returning completed forms participants received a coupon to a

local restaurant. An envelope was provided and parents were instructed to return the sealed envelope to the school office or to the child's teacher. Three hundred three packets were distributed. A total of 70 packets were collected and completed for a return rate of 23%. No uncompleted packets were returned.

Inclusion criteria for the normative sample included children having no history of any mental health diagnosis as reported by parents and scores within the normal or low-risk level on the ADHD-SRS. Four subjects were excluded from the comparison sample because they did not meet the inclusion criteria.

For the clinical sample, clinicians working with children with ADHD assisted with recruitment. Clinical data were collected at Utah State University's Center for Persons with Disabilities, ongoing research projects through Utah State University, from psychologists within Nebo School District, and the Utah County CHADD chapter. In all clinical settings except CHADD, the clinician described the study to parents who had a child with ADHD and if a parent was interested in participating, the clinician obtained consent from the parent. Upon consent, the parent and child measures were completed in session. Parents were given a coupon to a local restaurant for completion of the measures. Participants from the Utah County CHADD chapter were given packets at their monthly CHADD meeting, and upon completion of the measures were given a coupon to a local restaurant.

A total of 58 packets were distributed to parents of children with ADHD. Fifty-one packets were distributed to parents by the student investigator. Of these, 23 packets were collected and completed for a return rate of 45%. Seven packets were distributed

to parents by clinicians. All seven of these packets were collected and completed for a return rate of 100%. The total return rate for the clinical sample was 52%. No uncompleted packets were returned. All children in the clinical sample had to score within the at-risk or high-risk level on the ADHD-SRS. Three subjects were excluded from the clinical sample because they did not meet the inclusion criteria.

Participation in the study was completely voluntary. To maintain confidentiality, no names were written on any of the completed rating scales; instead, each child was assigned a research identification number, and that number was written on each form. All participants completed all items on the measures.

CHAPTER IV

RESULTS

This study examined the psychometric properties of the BCADS, Child and Parent versions. The BCADS produces subscale scores in three domains: inattention, impulsivity, and hyperactivity. The BCADS scores are reported as raw scores; each domain score is a sum of the Likert ratings (on a scale of 1-4) for each item in that domain; the total test score is the sum of the three subscale scores. Each subscale produces raw scores on a continuum from 0 to 72; high scores indicate the presence of more ADHD symptoms.

Mean scores were computed for each rater on the BCADS (parent, self), and ADHD-SRS (parent); and each sample (clinical, comparison, total sample). See Tables 2, 3, and 4 for means and standard deviations for each scale.

The first hypothesis of this study was that the internal consistency of the BCADS-Child and BCADS-Parent would be moderate to high. To test this hypothesis,

Table 2

Means and Standard Deviations (SD) for Boatwright Bracken Child Attention Scales:

Self-Report Scale

BCADS scales	Non-ADHD (<i>n</i> = 66)		ADHD (<i>n</i> = 27)		Total sample (<i>N</i> = 93)	
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>
Inattention	34.15	8.172	48.78	7.787	38.40	10.43
Hyperactivity	38.32	7.878	51.81	6.000	42.24	9.59
Impulsivity	35.11	7.710	48.15	6.353	38.89	9.43
Total	107.58	22.057	148.74	16.204	119.53	27.76

Table 3

Means and Standard Deviations (SD) for Boatwright Bracken Child Attention Scales:

Parent-Report Scale

BCADS scales	Non-ADHD (<i>n</i> = 66)		ADHD (<i>n</i> = 27)		Total sample (<i>N</i> = 93)	
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>
Inattention	35.36	6.912	54.37	7.909	40.88	11.26
Hyperactivity	37.58	6.556	53.93	7.426	42.32	10.08
Impulsivity	38.29	6.302	54.30	6.753	42.94	9.71
Total	111.23	17.775	162.59	18.666	126.14	29.52

Table 4

Means and Standard Deviations (SD) for ADHD-SRS: Parent-Report Scale

BCADS scales	Non-ADHD (<i>n</i> = 66)		ADHD (<i>n</i> = 27)		Total sample (<i>N</i> = 93)	
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>
Inattention	16.50	10.775	58.74	9.785	28.76	21.925
Hyperactivity-impulsivity	21.41	15.047	83.07	17.182	39.31	32.177
Total	37.91	24.238	141.81	21.002	68.08	52.805

internal consistency reliabilities using Cronbach's alpha were calculated. As shown in Table 5, the reliabilities for the total sample across all subscales and raters were quite high. Reliabilities across the two samples (comparison and clinical) for parent raters also reflect high internal consistency, as do reliabilities within the comparison sample for child raters. However, within the clinical sample for child raters, reliabilities for the hyperactivity and impulsivity scales reflect fairly low internal consistency.

Table 5

Internal Consistency of BCADS

Subscale	Non-ADHD	ADHD	Total sample
Inattention			
Parent	.8778	.8651	.9475
Self	.8725	.8010	.9112
Hyperactivity			
Parent	.8235	.8387	.9157
Self	.8107	.6024	.8615
Impulsivity			
Parent	.8221	.8104	.9118
Self	.8353	.6592	.8746
Total			
Parent	.9331	.9206	.9726
Self	.9375	.8423	.9550

The second hypothesis of this study was that there would be low to moderate correlations between the scores on the BCADS-Child and BCADS-Parent. Correlations between raters were obtained for each of the three BCADS subscales (Table 6). For the total sample, correlations between parent and self-ratings were high across all scales. On average, over 40% of the variance between parent and self-raters was shared or common variance. This is consistent with a moderate correlation and confirms the hypothesis stated.

For the clinical sample, the total parent-self correlation was low ($r = .072$), with only half a percent of the variance between parent and self-raters being shared or common variance. Subscale correlations were also low. For the comparison sample

(Table 6), the total parent-self correlation was low to moderate ($r = .457$), as were the subscale parent-self correlations. Twenty percent of the variance between parent and self-raters on the total score was shared (or common variance), confirming the above stated hypothesis. Due to the restriction of range within the individual samples, it is not surprising that the correlations within the comparison and clinical samples are not as high as those obtained using the total sample.

The third hypothesis of this study was that there would be significant differences between scores on the BCADS-Child and scores on the BCADS-Parent. It was hypothesized that children would report lower levels of ADHD symptoms than their parents. To determine if there were significant differences between raters, independent samples t tests were used. Because of the number of t tests conducted, a Bonferroni correction was applied within each group of analyses. Results were considered statistically significant if p -values were .0125 or less. Using the total sample there was a statistically significant difference between raters on the impulsivity subscale (Table 7), but not the other subscales. Mean scores (see Tables 3 and 4) indicate that children

Table 6

Correlations Between Raters for BCADS Subscales

Scale	Comparison ($n = 66$)		Clinical ($n = 27$)		Total ($N = 93$)	
	r	r^2	r	r^2	r	R^2
Hyperactivity	.449**	.201	.147	.021	.664**	.441
Inattention	.405**	.164	.239	.057	.666**	.444
Impulsivity	.464**	.215	.102	.0104	.663**	.439
Total	.457**	.209	.072	.005	.699**	.489

** $p \leq .001$

Table 7

Child-Parent Comparisons Total Sample

BCADS scales	<i>t</i>	<i>df</i>	<i>p</i> value	<i>ES</i>
Inattention	-1.561	184	.120	.030
Hyperactivity	-.060	184	.953	.010
Impulsivity	-2.881	184	.004	.525
Total	-1.574	184	.117	.300

reported fewer symptoms of impulsivity than their parents. The mean difference effect size (using the pooled standard deviation) between child and parent raters for this difference was of a medium magnitude.

Within the ADHD sample, there was a statistically significant difference between raters on the inattention, impulsivity, and total scales (Table 8). Children with ADHD reported fewer symptoms of inattention, impulsivity, and overall ADHD than their parents. These differences were all moderate in magnitude.

Within the comparison sample, there was a statistically significant difference between raters on the impulsivity subscale only (see Table 9), with children reporting fewer symptoms of impulsivity symptoms than their parents. The effect sizes for these differences were of a small magnitude.

The fourth hypothesis was that children with ADHD would self-report higher levels of ADHD symptoms than children without ADHD. To determine if there were significant differences between groups independent *t* tests were performed (Table 10). There was a significant difference between ratings of children with ADHD and those without ADHD on all scales of the BCADS. The effect sizes for these differences are

Table 8

Child-Parent Comparisons ADHD Sample

BCADS scales	<i>t</i>	<i>df</i>	<i>p</i> value	<i>ES</i>
Inattention	-2.68	52	.012	.684
Hyperactivity	-1.149	52	.256	.269
Impulsivity	-3.446	52	.001	.797
Total	-2.912	52	.005	.627

Table 9

Child-Parent Comparisons Non-ADHD Sample

BCADS scales	<i>t</i>	<i>df</i>	<i>p</i> value	<i>ES</i>
Inattention	-.920	130	.359	.148
Hyperactivity	.588	130	.557	-.093
Impulsivity	-2.596	130	.011	.412
Total	-1.047	130	.297	.165

Table 10

Non-ADHD-ADHD Self-Report Comparisons

BCADS scales	<i>t</i>	<i>df</i>	<i>p</i> value	<i>ES</i>
Inattention	7.940	91	.000	1.79
Hyperactivity	7.994	91	.000	1.71
Impulsivity	7.769	91	.000	1.69
Total	8.766	91	.000	1.87

all large indicating children with ADHD report many more symptoms of ADHD than do children without ADHD.

The fifth hypothesis was that parents of children with ADHD would report more ADHD symptoms for their children than parents of children without ADHD. To

determine if there were significant differences between groups independent *t* tests were conducted (Table 11).

There was a significant difference between ratings of parents of children with ADHD and those without ADHD on all scales of the BCADS. An examination of the mean scores indicates that parents of children with ADHD report more symptoms of ADHD than parents of children without ADHD. The effect sizes for these differences were all large.

The sixth hypothesis of this study was that there would be high correlations between the subscale and total scores of the BCADS-Parent and ADHD-SRS. The correlations between parent ratings on the ADHD-SRS and BCADS were moderate to high in the total sample and the comparison sample. However, the correlations in the clinical sample were low (Tables 12, 13, and 14). Due to the restriction of range within the individual samples, using the total sample is a better reflection of the true correlation between the BCADS-Parent and ADHD-SRS.

The seventh hypothesis was that there would be a low to moderate correlation between the subscale and total scores of the BCADS-Child and the ADHD-SRS. The hypothesis was formulated due to the low correlation among child and parent ratings for

Table 11

Non-ADHD-ADHD Parent-Report Comparisons

BCADS scales	<i>t</i>	<i>df</i>	<i>p</i> value	<i>ES</i>
Inattention	11.538	91	.000	2.75
Hyperactivity	10.500	91	.000	2.49
Impulsivity	10.891	91	.000	2.54
Total	12.468	91	.000	2.89

Table 12

Correlations for the BCADS and ADHD-SRS Subscales (Comparison Sample)

BCADS subscales	ADHD-SRS subscales		
	Hyperactive-impulsive	ADHD-SRS inattentive	ADHD-SRS total
Hyperactivity			
Self	.256*	.210	.252*
Parent	.685**	.453**	.627**
Inattention			
Self	.343**	.420**	.400**
Parent	.663**	.620**	.687**
Impulsivity			
Self	.285*	.228	.278*
Parent	.609**	.443**	.575**
Total			
Self	.318**	.310*	.336**
Parent	.726**	.565**	.702**

* $p \leq 0.05$ ** $p \leq 0.01$

Table 13

Correlations for the BCADS and ADHD-SRS Subscales (Clinical Sample)

BCADS subscales	ADHD-SRS subscales		
	Hyperactive-impulsive	ADHD-SRS inattentive	ADHD-SRS total
Hyperactivity			
Self	.130	.300	.246
Parent	.523**	-.103	.380
Inattention			
Self	.127	.265	.227
Parent	.027	.319	.171
Impulsivity			
Self	.049	.000	.040
Parent	.297	.232	.352
Total			
Self	.128	.238	.216
Parent	.327	.178	.351

** $p \leq 0.01$

Table 14

Correlations for the BCADS and ADHD-SRS Subscales (Total Sample)

BCADS subscales	ADHD-SRS subscales		
	Hyperactive-impulsive	ADHD-SRS inattentive	ADHD-SRS total
Hyperactivity			
Self	.643	.648	.661
Parent	.853	.743	.828
Inattention			
Self	.663	.702	.695
Parent	.811	.838	.842
Impulsivity			
Self	.634	.620	.644
Parent	.820	.782	.824
Total			
Self	.687	.698	.708
Parent	.870	.831	.875

Note. All correlations were $p \leq 0.01$.

other social-emotional assessment measures. Surprisingly, correlations between these measures were moderate to high for the comparison and total samples. Correlations between these measures were low for the clinical sample (see Tables 12-14).

CHAPTER V

DISCUSSION

Typically, ADHD is diagnosed primarily by gathering information from parents and teachers through interviews and informant-based rating scales. Information can be obtained from the child through an interview or broad-band self-report measure; however, a self-report of ADHD symptoms has typically not been incorporated in the diagnostic battery for ADHD, partly because, until recently, there were no self-reports of ADHD symptoms specifically available for children, although there are a limited number of adolescent self-reports available.

Although there may be some problems with self-report measures, examining children's self-reported behaviors may aid in diagnosis and treatment of ADHD because it gives the examiner the child's perspective of what behavior problems are being exhibited. Including children in the diagnosis of their own ADHD symptoms may increase their understanding and acceptance of ADHD, as well as compliance with treatment (Robin & Vandermay, 1996).

The Boatwright-Bracken Child Attention Deficit Scale is a new scale intended to measure ADHD symptoms in children ages 8-18. A self-report (BCADS-Child), parent-report (BCADS-Parent), and teacher report (BCADS-Teacher) are available. The items on the BCADS versions were adapted from the BAADS, a current adult self-report measure of ADHD, to be more appropriate for children (B. Bracken, personal communication, April 10, 2002). The BCADS-Child includes three subscales (inattention, hyperactivity, impulsivity) that assess the child's functioning in three

contexts including social, school, and personal. Because these measures have been recently developed the psychometric properties have not yet been fully investigated.

One previous study on the BCADS (Panter, 1996), investigated mother, father, teacher, and child ratings on the BCADS and ADDES to determine which raters best discriminated between those children with ADHD and those without ADHD. It was concluded that all raters discriminated children with ADHD from those without ADHD. The total scores of the ADDES and BCADS were significantly correlated indicating the two scales are measuring similar constructs. Panter also investigated the relationship between mothers' and fathers' self-ratings on the BAADS and ratings on the BCADS completed by children, parents, and teachers. Results indicate that parents' current symptoms predicted the ratings of their children on the ADDES and BCADS-Parent.

Due to the limited information on the psychometric properties of the BCADS, there was a need to investigate the reliability and validity of these measures for the purpose of using them in the ADHD diagnostic process. The purpose of this research project was to examine the psychometric properties of the BCADS-Child and BCADS-Parent. A sample of children with ADHD and a sample of children without ADHD were used as participants in this study.

The first objective of this study was to evaluate the internal consistency of the BCADS-Child and BCADS-Parent subscale and total scale scores. High internal consistency on all subscales and the total scale was found for the total sample. Scores within the comparison (non-ADHD) sample also reflected high internal consistency. However, in the self-report clinical sample, there was moderately low internal

consistency for the hyperactivity and impulsivity subscales. The low internal consistency in the clinical sample may be due to difficulties children with ADHD have in responding consistently because of attention problems. Due to the restriction of range within the individual samples, using the total sample is a better reflection of the internal consistency of this measure. Therefore, the results indicate that items on the measure are assessing the same construct. As hypothesized, the reliability estimates were above .80. These internal consistencies are within the range (.70 to .90) recommended for tests (Gall et al., 1996).

The second objective of this study was to assess the level of cross-informant agreement between parent and self-raters. It was hypothesized that there would be a low to moderate correlation between the scores of the BCADS-Child and BCADS-Parent. Overall, for the total sample parent-self ratings were moderately correlated. For the clinical sample, the parent-self correlations were low, and for the comparison sample, the parent-self correlations were low to moderate. Due to the restriction of range within the individual samples, using the total sample is a better reflection of the true correlation between the BCADS-Child and BCADS-Parent.

These results are consistent with Panter's (1996), in which agreement between parent-child ratings was moderate (.55 to .74). These findings are somewhat surprising as it is not uncommon for children to perceive their behavior differently than their parents and teachers. In fact, parent-child informants demonstrate an average agreement level of .22 (Achenbach et al., 1987). The current findings combined with Panter's finding indicate that when using the BCADS to assess ADHD, parents and

children report more agreement than is typically found on rating scales. However, there is still not an exact agreement between raters.

The third objective of this study was to determine if there were significant differences between child and parent ratings on the subscale and total scores of the BCADS. In the comparison and total sample there was a significant difference between raters on the impulsivity subscale with children reporting fewer symptoms of impulsivity than their parents. No significant differences were found on the inattentive or hyperactivity subscales. In the ADHD sample, there was a significant difference between raters on the inattention, impulsivity, and total scale subscales, but not on the hyperactivity subscale. The differences found indicate that children with ADHD and children without ADHD report fewer symptoms of ADHD than their parents.

Although it is impossible to evaluate from these data who is more accurate in their reporting of symptoms, it seems most likely parents are more valid reporters due to children's lack of cognitive development (Hope et al., 1999). Children may lack insight into problems, and, therefore, not be able to accurately self-report, or simply may not see their behaviors as problems. These current findings are consistent with the finding that children tend to report fewer externalizing symptoms than adults report for them (Volpe et al., 1999). There is a need for additional research with the BCADS to determine who is a more valid reporter.

The fourth objective of this study was to determine if there were significant differences between children with ADHD and those without ADHD in their ratings of their own behavior. There were significant differences of a large magnitude between

ratings of children with ADHD and those without ADHD on all scales of the BCADS. Children with ADHD reported more symptoms of ADHD compared to children without ADHD. These results are consistent with Panter's (1996) findings that both child and parent ratings accurately predicted ADHD diagnosis, and indicate the BCADS-Child may accurately distinguish between children with ADHD and those without ADHD. Although previous researchers have indicated that self-report may not be accurate (Quarto, 1997), these findings suggest they might be, at least with this scale. This finding supports the clinical validity of the BCADS and supports its use in ADHD evaluations.

The fifth objective of this study was to determine if there were significant differences between parents' ratings of children with ADHD and those without ADHD. As with child ratings, there were significant differences of a large magnitude between ratings of children with ADHD and those without ADHD on all BCADS scales. Parents of children with ADHD reported more symptoms of ADHD for their children compared to parents of children without ADHD. These results are consistent with Panter's (1996) findings that parent ratings accurately predicted ADHD diagnosis, and also supports the clinical validity of the BCADS and suggests that the parent report version would be helpful in the diagnostic process.

The sixth objective of this study was to determine the concurrent validity of the BCADS-Parent and ADHD-SRS. Correlations between parent ratings on the ADHD-SRS and BCADS were moderate to high for the total sample. However, the correlations in the clinical sample were low. Comparison sample correlations were higher,

indicating the BCADS-Parent and ADHD-SRS are comparable measures when assessing children who are not currently diagnosed with ADHD. Due to the restriction of range within the individual samples, using the total sample is a better reflection of the true correlation between the BCADS-Parent and ADHD-SRS. Overall, these findings support that validity of the BCADS-Parent particularly with children who are not currently diagnosed with ADHD.

The seventh objective of this study was to determine the concurrent validity of the BCADS-Child and ADHD-SRS parent ratings. It was hypothesized that there would be a low to moderate correlation between the subscale and total scores of the BCADS-Child and the ADHD-SRS. The hypothesis was formulated due to the low correlation among child and parent ratings for other social-emotional assessment measures. Surprisingly, the correlations between the BCADS-Child and ADHD-SRS were moderate to high. This further indicates parent and children agree on ADHD symptoms when using the BCADS-Child to assess self-reported ADHD symptoms.

Summary

In summary, this study provided information about the psychometric properties of the BCADS-Child and Parent measures. The results indicate that the BCADS is strong psychometrically, and could be an additional tool used in the assessment of ADHD.

Typically, the perspective of the child has not been taken into consideration by way of a self-report measure in ADHD evaluations. Concerns regarding the validity of

child self-report measures include children not being able to self-report their behaviors accurately because they lack insight into problems, children not seeing their behaviors as problems, or children having a tendency to “overendorse” symptoms when completing measures. However, in this study, children with ADHD identified and self-reported higher levels of ADHD symptoms than children without ADHD suggesting that they may be able to accurately identify symptoms of ADHD.

The results indicate that the BCADS-Parent is also strong psychometrically, and could be an additional assessment tool used to evaluate ADHD in children. Parents with children with ADHD reported higher levels of ADHD symptoms than parents of children without ADHD. Correlations between parent ratings on the ADHD-SRS and BCADS were moderate to high, indicating the BCADS-Parent is a comparable measure when assessing children who are not currently diagnosed with ADHD.

Overall the results, combined with Panter’s (1996) previous study, suggest that the BCADS-Parent and Child versions could be used concurrently as assessment tools. Both have strong psychometric properties and on both differences between children with and without ADHD are evident.

Limitations and Future Directions

Due to the limited number of girls in this sample, the reliability and validity of the BCADS used as a measure to assess ADHD in girls was not addressed. Because of this, it is not known if the psychometric properties would be different for boys and girls, and if the BCADS accurately identifies symptoms of ADHD in both genders. In order

to assess the psychometric properties for girls as well as boys, it would be necessary to obtain a large sample with an equal amount of girls and boys.

Assessing the psychometric properties for both genders would allow clinicians to know whether the BCADS is equally strong, and therefore, useful for both boys and girls. ADHD is sometimes considered to “look” different in boys and girls (Gaub & Carlson, 1997). For example, males with ADHD exhibit greater impairments in social conduct, whereas females with ADHD exhibit greater cognitive impairments and academic difficulties (Arcia & Conners, 1996).

Due to the limited ethnic diversity in this sample, the psychometric properties of the BCADS across cultures were not addressed. Assessing the reliability and validity of BCADS across ethnic groups would help determine if this scale is a valid measure of ADHD across ethnicity.

A further limitation is that this sample was geographically limited to the state of Utah, and consisted of a small sample size. Precisely how BCADS scores might vary as a function of geographic location is unknown, however it would be beneficial to obtain a more nationally representative standardization sample for the BCADS. This combined with the limited ethnic representation may limit the generalizability of these findings to other populations.

It would be interesting to conduct further studies on the concurrent validity of the BCADS-Child with other parent measures. Specifically, due to the unusually high correlations between the BCADS-Child and ADHD-SRS, it would be interesting to see

if the same level of parent-self agreement was present when using other parent measures.

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APPENDICES

Appendix A

Parent Letter

IRB Approval on
April 26, 2002

Utah State UNIVERSITY

DEPARTMENT OF PSYCHOLOGY
2810 Old Main Hill
Logan, UT 84322-2810
Telephone: (435) 797-1400
FAX: (435) 797-1448

Dear Parent:

We would like to ask for your participation in a study we are conducting to investigate the usefulness of a new measure for Attention Deficit Hyperactivity Disorder (ADHD). Many children are evaluated for ADHD and it is important to have measures that can help accurately diagnosis this disorder. You and your child are being asked to participate simply because you have a child in grades 3-6; not because there are any concerns about your child's behaviors. When investigating new assessment tools for ADHD, it is important to have information about children without ADHD, as well as those with ADHD.

If you are interested in participating in this study, please read and sign the enclosed consent form that describes the study in more detail. By signing the consent form, you are also agreeing to have your child participate in this study. Two weeks after obtaining written consent from you, your child will be asked to complete a brief measure on his/her behavior.

In addition, please complete the enclosed measures on your child's behaviors. Please send back with your child all of the forms (keeping one copy of the consent form for yourself) within two weeks. Upon returning the consent form of whether or not you want to participate in the study, and the completion of the forms, a coupon for a local restaurant will be sent home to you with your child. If you have any questions about the study feel free to contact one of us.

Thank you for your time and interest.

Sincerely,



Erica S. Thomas, B.S.
Graduate Student



Gretchen A. Gimpel, Ph.D.
Associate Professor

Appendix B
Informed Consent

IRB Approval on
April 26, 2002

Utah State UNIVERSITY

DEPARTMENT OF PSYCHOLOGY
2810 Old Main Hill
Logan, UT 84322-2810
Telephone: (435) 797-0460
FAX: (435) 797-1448

Page 1 of 3
Date Prepared: May 7, 2002

Informed Consent

The reliability and validity of the Boatwright-Bracken Child Attention Deficit Scales-Child and Parent Versions

Introduction

Erica Thomas, a graduate student in the Psychology Department at Utah State University, and Dr. Gretchen Gimpel, a faculty member in the Department of Psychology are conducting research to investigate a new questionnaire, the Attention Deficit Hyperactivity Disorder (ADHD) (the Boatwright-Bracken Child Attention Deficit Scales-Child and Parent Version). Approximately 400 students in 3rd to 6th will participate in the study. You have been asked to take part because you are a parent of a child in the third through sixth grade.

Procedures

You will be asked to complete a form that asks basic information about your child (age, grade level, etc.). You will also be asked to complete two paper and pencil questionnaires that ask questions about your child's behavior. If you return the materials within two weeks you will be given a coupon to a local restaurant.

Two weeks after consent, your child will be asked to complete a form about his/her behavior. If your child completes the form he/she will be given a coupon to a local restaurant.

New Findings

You will be told of any significant new findings discovered during the course of this study via either a mailed letter or a phone call.

Risks

There are no potential serious risks associated with participating in the study. You might experience some psychological distress completing the rating scale on your child's behavior and your child might experience some psychological distress completing the measure, but these risks are considered minimal.

Benefits

This research has the potential to have substantial significance for clinicians, teachers, and parents who are interested in the assessment of children with ADHD. There will be no direct benefit to the participant. Information obtained from this study will provide helpful information and a new measure for ADHD.

Explanation and Offer to Answer Questions

Erica Thomas, Dr. Gretchen Gimpel, or a school psychologist/clinician working with them, have explained this study to you and have answered any questions you have at this time. If you have other questions, you may reach Erica Thomas at (435) 770-7218 or Dr. Gretchen Gimpel at (435) 797-0721.

IRB Approval on
April 26, 2002



DEPARTMENT OF PSYCHOLOGY
2610 Old Main Hill
Logan, UT 84322-2810
Telephone: (435) 797-1460
FAX: (435) 797-1448

Page 2 of 3
Date Prepared: May 7, 2002

Informed Consent

The reliability and validity of the Boatwright-Braeken Child Attention Deficit Scales-Child and Parent Versions

Voluntary Nature of Participation and Right to Withdraw Without Consequence

Participation in this research study is entirely voluntary. You may refuse to participate or refuse to have your child participate or withdraw from the study at any time without consequence.

Confidentiality

Information about you and your child will be kept confidential and will be available only to people directly involved in the project. You and your child will be assigned a code number and this number will be used when the data is stored in the computer. Public presentations on results of this study will in no way identify you or your child. All data will be kept in a locked file cabinet, which will be accessible only to people directly involved in the project that may identify you or your child.

IRB Approval Statement

The Institutional Review Board (IRB) for the protection of human subjects at Utah State University has reviewed and approved this research project. You may call the IRB at (435) 797-1821 with any questions regarding the approval of this project.

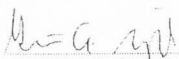
Copies of Consent


You have been given two copies of this Informed Consent form. Please sign both and retain one copy for your files.

Investigator Statement

"I certify that the research study has been explained to the above individual by me or my research staff, and that the individual understands the nature and purpose, the possible risks, and benefits associated with taking part in this research study. Any questions that have been raised, have been answered."

Signature of Principal Investigator and Student Investigator


Gretchen A. Gimpel, Ph.D.
Principal Investigator
(435) 797-0721


Erica S. Thomas, B.S.
Student Investigator
(435) 770-7218

Signature of Subject

I have read and understand this consent form and I am willing to participate in this study.

Signature _____

Date _____

IRB Approval on
April 26, 2002

Utah State UNIVERSITY

DEPARTMENT OF PSYCHOLOGY
2810 Old Main Hall
Logan, UT 84322-2810
Telephone: (435) 797-1460
FAX: (435) 797-1446

Page 3 of 3
Date Prepared: May 7, 2002

Child Assent

I understand my parent(s) is/are aware of this research study and that permission has been given for me to participate along with my parents. I understand it is up to me to participate even if my parents say yes. If I do not want to participate I do not have to. No one will be upset if I do not want to participate or if I change my mind later and want to stop. I can ask questions I have about this study now or later. By signing below I agree to participate.

Name/Signature _____

Date _____

Appendix C
Demographic Information

Parent Information

Relationship to Child _____

Highest Level of Education Completed (Check One):

did not complete high school completed high school
 completed some college completed college
 completed graduate/postgraduate education

Current Marital Status (Check One):

married never married separated/divorced widowed

Child Information

Child's Age _____

Child's Grade Level _____

Child's Gender (Check One):

male female

Child's Ethnicity (Check One):

Latino/a African American Caucasian
 Asian Native American Other

Has your child been diagnosed with Attention-Deficit Hyperactivity Disorder (ADHD)?
(Check one)

yes no
 If yes, when was the diagnosis made? _____

If yes, please indicate any treatment (including medications or therapy) your child receives for his/her ADHD (If none, please indicate NA) _____

Has your child been diagnosed with any other behavioral or mental health problems?
(Check one)

yes no

If yes, what? _____
